

The Complete Correspondence of Edward Hitchcock and Benjamin Silliman, 1817-1863
The *American journal of science* and the rise of American Geology

Transcribed and annotated by Robert L. Herbert, with an introductory essay

Preface

Part One: Geology and the first years of the American journal of science, 1817-1830

The American journal of science, 1817-1823
Hitchcock's Sketch of the geology, 1823-1824
Hitchcock's Utility of natural history, 1823
Buckland's *Reliquiae diluvianae*
Hitchcock at Amherst College
Scrope and Cordier: the fiery earth, 1825-1829
Silliman and Hitchcock in 1830
Looking back from 1830

Part Two: Hitchcock's prime decade, 1831-1841

Silliman in 1833
Hitchcock, 1831-1833
Hitchcock and Silliman, 1833-1835
1836: Hitchcock's "Sandstone Bird"
The Mosaic controversy, 1837-1839
Hitchcock's geology, 1836-1839
Hitchcock's growing renown, 1840 and 1841

Part Three: The final decades, 1842-1863

Silliman, 1842-1864
Hitchcock's life, 1842-1864
Science and the Bible, 1842-1863
Rocky strata and drifting boulders, 1842-1863
Hitchcock's controversy with James Deane, 1842-1845
Fossil sandstone impressions, 1844-1863

Appendix A: William Maclure

Appendix B: Amos Eaton

The letters

Bibliography

Preface

I began this project in order to trace Edward Hitchcock's apprenticeship to geology, but it soon turned in directions I hadn't anticipated. Benjamin Silliman's heirs had sent back to Amherst College most of the letters he had received from Hitchcock, so I was lucky to have access to both sides of their correspondence in the college's Archives and Special Collections. I also located a few more letters from other archives.¹ Because Silliman's handwriting is difficult, I had to transcribe his letters just to be sure of their content. By then I was so intrigued by the back-and-forth between the two men that I decided it would be an interesting venture to transcribe and annotate the whole correspondence. It begins with the first years of Silliman's American journal of science, the premier American scientific review; it's constantly referred to in the two men's letters. Their correspondence proves to be an ideal vehicle for studying American geology, then in its infancy; Hitchcock was one of Silliman's steadiest reviewers. I learned a lot about the two men's ideas, and also a great deal about the other contributors to Silliman's journal. Two of his writers, William Maclure and Amos Eaton, both major figures of those years, unwittingly revealed themselves in their articles.² Their foibles, indeed their flaws, are laid bare, so they deserve more than the occasional footnote I've given other contributors. I've therefore appended separate short accounts of what a close reading of Silliman's journal tells about those two geologists. Comparisons with them are valuable ways of locating Hitchcock in the evolution of geology from 1817 to the 1830s.

The Hitchcock-Silliman letters deal almost exclusively with professional concerns. Little is said about the two men's private lives except indirectly, and very little about religion, aside from brief exchanges about the "Mosaic controversy," the supposed opposition of new geology to the literal reading of Genesis. This controversy took on great importance in their publications as will be made clear. Of interest to mineralogists are the accounts of several minerals that Hitchcock first identified in Massachusetts, and of the specimens he sent to Silliman. Both men wrote frequently about the geological maps that Hitchcock was making of Massachusetts in 1818, 1822-1823, 1830, and 1841. He located and described various strata and fossils, including sandstone animal tracks as well as fossil fish that he shipped to Silliman. For the economic historian, there is much to learn about shipping specimens and letters by water and land between Amherst and New Haven. Botanists will take an interest in Hitchcock's identification of native plants. Historians of science and education will be intrigued and no little amused by the two men's chemical laboratories, their supplies, arrangements, and apparatus. Galvanic electricity loomed large in the 1820s when Silliman's classmate Robert Hare sent plans for his battery-run instruments, his "deflagrator" and his "calorimotor," as well as for his oxy-hydrogen blowpipe. The letters tell about their uses and the accidents that both Silliman and Hitchcock suffered.

The chief value of the letters and of this essay lies in the study of the rapid evolution of early modern geology in the United States. Hitchcock's reviews of the latest European geological publications and the consequent growth of his own views chart the changes from the early 1820s to the early 1840s. The letters deal with the aftermath of the turn-of-century controversy between the geological concepts of the Scot James Hutton and the German Abraham Werner. Surprisingly, despite his devotion to theology, Hitchcock proves to have been ahead of other American geologists, including Silliman, because he abandoned Werner's ideas while he adapted European concepts to American geology. The correspondence is rich in news about or from scientific colleagues on the Hutton-Werner dispute and on many contemporary issues. Silliman's cosmopolitan travels and his role as editor meant frequent and sometimes revealing references to foreign savants, including William Buckland, W. D. Conybeare, Gideon Mantell, Adam Sedgwick, and P. L. A. Cordier. Also appearing in the correspondence are many American scientists, among them Chester Dewey, Eaton, Maclure, John Torrey, and John White Webster, all of whom were known to both Silliman and Hitchcock. In effect, the forty-six years of their correspondence are a treasure-trove.

In my introductory essay, Hitchcock takes a more prominent place than Silliman. For one thing, Silliman was far better known and studied, whereas Hitchcock long ago dropped out of the ranks of major geologists. George P. Merrill's *The first one hundred years of American geology* of 1924 is the last broad history that gave Hitchcock a leading role. My essay and the letters therefore serve the remedial purpose of restoring the Amherst professor to the attention he deserves. As we shall see -- and it's a considerable surprise -- he was much more an

¹ I'm grateful for the generous response to my inquiries by colleagues at Amherst College's Archives and Special Collections: Margaret R. Dakin, Daria D'Arienzo, former head, Michael Kelly, current head, Peter Nelson, Mariah Sakrejda-Leavitt, and Marian N. Walker. From the beginning of this project, Daria D'Arienzo has been an indispensable counsellor. My wife, Eugenia W. Herbert, has been a long-suffering helpmate and proofreader.

² My annotations of the letters record biographical dates and biographical references for the persons named, which spares me the need to include the same information here, except when it seems important to the context.

original thinker than Silliman. At the outset of their correspondence, Silliman was fifteen years older and had matured sooner than Hitchcock, so virtually a whole generation separated them. Silliman was a cosmopolitan New England patrician, well connected, widely traveled, author of well appreciated travel accounts, and familiar with leading American and European scientists whom he welcomed to the pages of his journal. By contrast, Hitchcock was a provincial from lower middle class origins with no college degree and a rank beginner in the sciences. I've taken the correspondence as an excuse to trace his intellectual development from parochial isolation to well-earned eminence in geology. He was also known as a leading theologian, and I'll do justice to his dual career although I'll favor science. This essay is divided into three chronological portions as a convenient way of coordinating the interchange of ideas within the successive periods.

Abbreviations used throughout the introduction:

AJS = American Journal of Science.

Box = File location in EOH.

BS = Benjamin Silliman.

EH = Edward Hitchcock.

EOH = Orra White and Edward Hitchcock Papers, Archives and Special Collections, Amherst College.

Part One: Geology and the first years of the American journal of science, 1817-1830

Edward Hitchcock (1793-1864), a middle class provincial, is a decided contrast with Benjamin Silliman (1779-1864), son of an urbane patrician family. Hitchcock was born in Deerfield, Massachusetts, one of several children of an impecunious hatter. He studied at Deerfield Academy from 1804 to 1809, then, to make ends meet, he worked on an older brother's farm while depending on the family home. He couldn't afford college but independently studied botany, mineralogy, astronomy, and mathematics, the latter two subjects in collaboration with his mentor, his maternal uncle General Epaphras Hoyt (1765-1850). Hoyt, whose publications on military science included astronomy and mathematics, was well equipped to aid his studious nephew. Nephew and uncle studied astronomy together from 1811 to 1815, using Deerfield Academy's instruments. Edward published a miscellany in 1813, lectured locally on science, and wrote on diverse subjects for local weeklies.³ In 1816 he was made principal of Deerfield Academy and taught there, but he had to leave at the end of 1818 when a depressed economy forced the school to close for a time. Like so many others of his generation he had to patch together several vocational and intellectual pursuits to form a career. When he began corresponding with Silliman in 1817 he was already engaged in extensive geological and botanical study of the Connecticut River Valley which would be the subject of his first contribution to the American journal of science.

In contrast to Hitchcock, whose early life is only sketchily known, the youth and early maturity of Benjamin Silliman is well documented. In 1796, at age seventeen, he earned his bachelor's degree at Yale College. His law degree followed in 1802 but he never practiced for he had been made tutor at Yale College in 1799 by President Timothy Dwight, a family friend. Two years later Dwight, who wished to expand Yale's standard curriculum, invited Silliman to be the college's first professor of chemistry and natural history. The young man had no preparation in those fields but Dwight had confidence in his intelligence. Silliman spent nearly two years studying chemistry at the University of Pennsylvania in Philadelphia and also attended classes there in the natural sciences. In 1805, after a year's lecturing on chemistry at Yale, he received funds from the college for study in Great Britain. Silliman was welcomed in London by many leading British scientists and dignitaries, and traveled widely throughout southern England. He then spent six months studying anatomy, chemistry, medicine, and mineralogy at the University of Edinburgh. There too he kept privileged company with scientists and notables, and became alert to the opposing geological theories of Hutton and Werner. He favored Werner and is usually credited with bringing the German's ideas to the United States.

In 1809, three years after he began teaching chemistry, Silliman married Harriet Trumbull, daughter of Jonathan Trumbull, Jr., governor of Connecticut. By then he had been closely studying the geology of the New Haven region, and in 1810 secured the loan of the famous mineralogical collection of George Gibbs. Subsequently acquired by Yale, it became the nucleus of one of America's leading science museums. 1810 was a banner year for Silliman. He was instrumental in founding the Medical Institution of Yale College and the same year he

³ Hitchcock 1863, *Reminiscences*, pp. 388-89.

published his first article on geology.⁴ Five years later he introduced courses in mineralogy. In the decade following his founding of the American journal of science in 1818, he became one of the most prominent scientists and educators in the United States.

I shall end the first portion of this study of the two men in 1830, when Hitchcock was appointed state geologist, a year that marked his acknowledged maturity as scientist. I proceed chronologically using the American journal of science as the chief resource for documenting the correspondence and also as the place where both men disclosed their slowly shifting conceptions of geology. The most surprising finding is that Hitchcock rapidly abandoned most of Werner's concepts although Silliman clung to the German's central idea. Unlike most American contemporaries, including Maclure and Eaton, Hitchcock adopted the views of leading European geologists like Conybeare and Cordier; by 1830 he was at the leading edge of modern geology.

The American Journal of Science, 1817-1823

Hitchcock first made contact with Silliman in the summer of 1817 by sending some specimens of Massachusetts minerals he wished to have identified. Silliman had already been mapping the geology of Connecticut. His cordial reply (8.24.17) asked Hitchcock to describe the extent and strata of the greenstone (basalt) whose samples he had sent. The neophyte's answer (9.1.17) probably astonished Silliman, because Hitchcock proved that he was already well advanced in mineralogy and that he had been making a geological map of the Connecticut River Valley from Northampton to Vermont. He added that in collecting minerals and rocks, he was working with Dr. Stephen West Williams of Deerfield. That town was no backwater, and Hitchcock had the advantage of knowing a group of physicians there, including Williams, Dennis Cooley, and David Hunt, who were well versed in the natural sciences and were exploring local botany and mineralogy.⁵ They were encouraged by attending lectures on natural history given in Amherst and Northampton by the itinerant Amos Eaton in 1817 and 1818.⁶ Until about 1822, Hitchcock engaged in friendly rivalry and cooperation with Williams and Cooley as each was forming a herbarium; they also shared some mineral discoveries. Hitchcock's mineralogical specimens and his geological mapping were evidently useful to Silliman, so their correspondence benefited both. From their letters we learn about the difficulties they had in shipping specimens back and forth. There were commercial porters available who used both the river and land, but their schedules were at best episodic and Hitchcock at times had to deposit a shipment with Daniel Wadsworth, a friend of Silliman's, in Hartford (7.6.18 and 4.9.21).

In October 1817 Hitchcock wrote Silliman to say that he was sending more minerals, together with his geological map and "observations" that he hoped to submit to "some society" for publication (10.16.17). He introduced Orra White (1796-1863), a teacher of art and science at Deerfield Academy, who was helping him with his map and who had drawn two landscapes to accompany his text.⁷ From other evidence we know that in 1817 she began making watercolors of native plants that Edward was gathering for a herbarium.⁸ This was the beginning of their lifelong collaboration—they were married in 1821. She became the chief illustrator of his scientific writings, a boon to him because she was trained in science and used a decorative flair to make striking watercolors and landscape drawings. Silliman's reply (10.27.17) announced that he was planning a scientific journal and would be glad to publish Hitchcock's map and text, for which he would make editorial suggestions.

Silliman's first issue appeared in the summer of 1818: *The American journal of science*, more especially of mineralogy, geology, and the other branches of natural history, including also agriculture and the ornamental as well as useful arts.⁹ Silliman probably got some subsidies from friends and colleagues, but didn't acknowledge this publicly. He put in his own funds for several years because the slowly growing number of subscriptions didn't cover its costs. (It remained in a parlous financial state until the late 1820s.) Its first issue lived up to its long title, with articles gathered under the rubrics Geology, Mineralogy, Topography, Botany, Zoology, Physics and

⁴ Silliman, "Particulars relative to the lead-mine near Northampton (Massachusetts)," *The American mineralogical journal*, 1, 2 (1810): 63-69.

⁵ Burk 1994, pp. 75-96.

⁶ See Appendix B, "Amos Eaton."

⁷ For her life and work, and relevant bibliography, see Herbert and D'Arienzo 2011.

⁸ Jacob Bigelow to Edward Hitchcock, April 22, 1817. This letter, and the Hitchcock-Silliman correspondence, is among the papers of Edward and Orra White Hitchcock in Amherst College's Archives and Special Collections, Box 3, folder 1. I shall hereafter abbreviate the Hitchcock papers as "EOH."

⁹ The *AJS* was jointly published by J. Eastburn and Co., New York, and Howe and Spalding, New Haven. Subsequent issues bore the title *American journal of science and Arts*, soon shortened to *American journal of science &c*. Then with the seventh volume in 1824, "&c" was dropped.

Chemistry, Agriculture and Economics, Miscellaneous, and Intelligence. The latter was a digest of science-related news from American and foreign journals. For his first volume's four issues, which stretched through 1819, Silliman gathered articles by many of America's best-known practitioners of natural philosophy,¹⁰ among them J. F. Dana, George Gibbs, William Maclure, and Thomas Say, as well as several whom Hitchcock knew personally, including Jacob Bigelow, Chester Dewey, Amos Eaton, Eli Ives, Thomas Nuttall, and J. W. Webster. For the "useful arts," one of Silliman's regular contributors (two articles in the first volume, many thereafter) was Robert Hare, professor of chemistry at the University of Pennsylvania, friend and associate of Silliman's since their student days together. Hare offered engravings and detailed accounts of the instruments he fashioned for the study of chemistry and galvanic electricity.

Silliman was himself a major contributor to the journal's pages, often as the anonymous reviewer of books or events, frequently as author of editorial comments, and occasionally as writer of articles. In his introduction to the first issue, Silliman mentioned Maclure's recent "grand outline" of geology, *Observations on the geology of the United States* (1809). Maclure traveled all over the eastern United States, identifying geological formations using Werner's classification system. He published the earliest geological map of America and then in 1817 edited an enlarged edition of his influential *Observations*. Silliman thought highly of this work but wrote that more extensive geological research was needed to pass beyond the prior years of "geological speculations." He was pleased that geology "has now assumed a more sober character; the science of geology has been reared upon numerous and accurate observations of facts; and standing thus upon the basis of induction, it is entitled to a rank among those sciences which Lord Bacon's Philosophy has contributed to create."¹¹

Also in his first issue, Silliman reviewed the best recent American book on geology, one that was indeed based on facts, Parker Cleaveland's *An elementary treatise on mineralogy and geology* (Boston 1816). Cleaveland described minerals and geological formations in patient detail, so carefully worded that one could identify most without the aid of images. He used Werner's nomenclature based on purely external characteristics but faulted him for not dealing with the mineral forms. For this Cleaveland turned to the system of Abbé Haüy who analyzed minerals in terms of their crystalline and chemical makeups, in the latter case, evoking the work of Alexandre Brongniart.¹² Although Cleaveland briefly summarized Hutton's theory, he didn't employ it because he refused to speculate on the origins of rocks although he implicitly accepted Werner's Neptunism.

Cleaveland's inductive method and his concomitant distrust of theory was admired by Silliman and, as shall be seen, by Hitchcock. This insistence upon fact became a distinctively American trait. European geologists had had a much longer time to examine their terrain and speculate on it but since they hadn't yet studied American geology, the formations that native scientists were now uncovering didn't readily accommodate European theories. Americans were more secure in empirical descriptions, an approach that was reinforced by a materialism and a chauvinistic belief in American exceptionalism that marked the era. In his introduction to his first issue, Silliman also embraced two other viewpoints typical of his culture. One is the belief that "the whole circle of physical science is directly applicable to human wants, and constantly holds out a light to the practical arts; it thus polishes and benefits society." The other is the underlying conception that the sciences demonstrate "both supreme intelligence, and harmony and beneficence of design in The Creator."¹³ Both beliefs were fundamental to American Protestants and allowed Silliman and Hitchcock to adopt a progressive religious outlook that reconciled science with the Bible.

Throughout the fall of 1817 and all of 1818 there was a flurry of letters between Hitchcock and Silliman, dealing with specimens Hitchcock sent to Yale along with his map and observations on Connecticut River Valley geology. Hitchcock and Williams sent more specimens to Yale, and Silliman asked them to prepare an article on the lead mine in Southampton which he himself had written about in 1810 (3.31.18). They were willing, but Amos Eaton intervened and supplied the article for the second issue of the new journal.¹⁴ Hitchcock and Silliman met at last in the spring of 1818, when Hitchcock spent several weeks at Yale, auditing Silliman's lectures and inquiring into study for a degree in theology. After several years of Unitarianism, Hitchcock had returned to orthodox Calvinism and planned life as a minister. He was ordained in May, 1821, and became the Congregational pastor in

¹⁰ The epithet "scientist," first used by William Whewell (1794-1866) in 1840, was frequently employed by Hitchcock in his 1863 *Reminiscences*.

¹¹ Silliman 1818, p. 7.

¹² René Just Haüy, *Tableau comparatif des résultats de la cristallographie de l'analyse chimique, relativement à la classification des minéraux* (Paris 1809); Brongniart, *Traité élémentaire de minéralogie* (Paris 1807).

¹³ Silliman 1818, p. 8.

¹⁴ See Appendix B, "Amos Eaton."

Conway, Massachusetts. However, his preoccupation with science never flagged and while serving his parishioners, he carried out research and publications in geology and natural history.

Although mineralogy and geology were Hitchcock's chief scientific preoccupations in 1817 and 1818, he didn't neglect botany. In September 1818, he informed Silliman of the herbarium which had loomed large in his work that summer. In forming it, he exchanged specimens with Williams and Cooley, and collaborated closely with White.

I have collected above 800 plants in this vicinity the past summer, 150 of which have been painted by Miss White, the one who painted the maps etc. But I have yet little knowledge of botany. I suppose a list of our indigenous plants would not be of interest enough for a place in the Journal and therefore I do not propose to make one out. Miss White also copied & enlarged the view of the falls in Connecticut river which I sent you at first with the maps and I forwarded it to the editor of the *Port Folio* (9.28.18).¹⁵

In the autumn of 1818 Silliman, pleased by Hitchcock's ambition and his precocious grasp of mineralogy, and thankful for his specimens, had Yale award Hitchcock an honorary M.A. (12.11.18). Hitchcock again spent a few weeks that fall at Yale, studying theology but also auditing Silliman's lectures and probably other courses elsewhere in the college. Silliman wrote to him in December that the whole edition (one thousand copies) of the first issue of the *American Journal of Science*, published the previous summer, was exhausted and being reprinted, and that he would print fifteen hundred copies of the second issue (12.11.18). Because of delays in engraving Hitchcock's map (eventually White colored the engravings by hand), and because of Silliman's tactful but firm requests for greater precision, the article didn't appear until the end of 1818 in the journal's second issue. Although signed "Deerfield, October, 1817," the map and text had gone back and forth between New Haven and Deerfield for a further year of editing. It was Hitchcock's first publication on geology, a notable one for a writer so new to the field.¹⁶ To identify minerals and rocks he had been using Cleaveland's *Elementary Treatise* (9.1.17). Lacking images, he had to apply Cleaveland's verbal descriptions to what he was seeing, aided by a few specimens he probably found in Deerfield and by those in Silliman's collections.

In his article, Hitchcock covered a swath of land about twelve miles either side of the Connecticut which he had tramped over for two years or more. He described the formation of the land, keyed to his colored map and its coordinates, which he had enlarged from a published map with the aid of a pantograph. It was far more detailed than Maclure's map. He naively but honestly wrote that within the map's general outlines, "the intermediate objects were placed chiefly by the eye; their relative situations being determined by travelling over the ground, and viewing them from different elevations." He used his uncle Hoyt's astronomical work and a year's worth of his own lunar observations to establish the latitude and longitude of Deerfield. In addition to listing many specific rocks and minerals, an important contribution in these early days of American geology, he revealed just how perceptive he was. From the pebbly terraces he found many feet above the Connecticut River at Deerfield, he posited a prehistoric lake that had once stretched south to central Connecticut. This was a capital discovery for a beginner and showed him to be a promising observational scientist (it was named "Lake Hitchcock" after his death).

The same issue of Silliman's journal included Eaton's article on the Southampton mine, already mentioned, and the editor's own "notice" of a major painting recently completed by John Trumbull, his father-in-law's brother.¹⁷ He lavished great praise upon the large painting, "the greatest work which the art of painting has ever produced in the United States." This short piece marks the beginning of Silliman's public devotion to the painter, whom he had long known, that culminated in his managing Yale's purchase of the artist's work in 1831. The following year he became curator of the new Trumbull Gallery, the first Yale art museum.

The third issue of Silliman's first volume appeared in the spring of 1819. Articles signed in March, June, and August 1818 tell of the usual gap between submission and publication. Maclure made his first appearance here, with introductory remarks by Silliman who had accompanied the older geologist in 1808 when he was

¹⁵ Hitchcock, "A view of the Falls on Connecticut River," *Port Folio* (Philadelphia, Dec. 1818): 449. This is a very short text with an engraving after Orra White's drawing. For the Hitchcock herbarium, see Herbert and D'Arienzo 2011, cat. 11. Silliman appreciated White's work and told Hitchcock he would welcome her botanical illustrations and reproduce them in color (12.11.1818).

¹⁶ Hitchcock, "Remarks on the geology and mineralogy of a section of Massachusetts on Connecticut River, with a part of New-Hampshire and Vermont, by Edward Hitchcock, A.M., Principal of Deerfield Academy," *AJS* 1, 2 (1818): 105-16. Merrill 1924, p. 55, called the article "remarkable."

¹⁷ Silliman, "Notice of Colonel Trumbull's picture of the Declaration of Independence," *AJS* 1, 2 (1818): 200-03. The large painting (12 x 18 feet), a government commission, is in the Capitol Rotunda in Washington.

exploring the New Haven region for his famous survey. Silliman had written abroad in 1818 to ask the peripatetic Maclure to help him specify some nearby formations of which he was unsure.¹⁸ Using Werner's classification system, Maclure urged more precision in giving the relative positions of the "transitional" and "secondary" strata, adding somewhat vaguely that "I am rather of opinion that they [the secondary] would all differ from one another." At the opposite end of the spectrum from general to particular was Hitchcock's modest contribution to the same issue.¹⁹ He gave a minute description of a large elliptical frost upheaval raised above ground, circumnavigated by a narrow ditch. Then, for the final issue of Silliman's first volume, he wrote a three-page supplement to his article on the Connecticut River Valley, carefully describing minerals and formations based on his never-ceasing exploration of its geology.²⁰

Hitchcock studied at Yale from May to September 1819, and again from November to January, 1820. Although destined for the ministry, he couldn't let science atrophy; the two fields cohabited then and for the rest of his life. There are two unpublished manuscripts of these months at Yale that reveal both his budding religious vocation and his secular studies.²¹ He pursued theology with Rev. Eleazar T. Fitch, attended a meeting of the "Association of Ministers" in West Haven in May, conducted his "first effort in the pulpit" in June, and in mid-June took a boat to Lyme to attend the "General Association of Ministers of Connecticut," whose supper was attended by 600 "professors of religion." He then went across the Sound to Oyster Bay for more religious meetings, and there took a few notes on rocks and plants. At Yale from June 14 to July 16 he annotated Silliman's lectures on chemistry, mineralogy, and geometry. Again, from December 7 to January 8, 1820, he made notes of Silliman's lectures, often two a day.

We know the approximate tenor of Silliman's geology in 1820 from his review of Horace H. Hayden's Geological essays that he published in the American journal of science.²² Silliman generally agreed with Cleaveland's Elementary treatise, but departed from him by speculating on the state of the earth prior to the account in Genesis. Cleaveland dealt mostly with geologically recent "alluvial" deposits dating from Noah's deluge. Silliman, thinking of extensive strata below the "alluvial," was convinced of a deep time before Noah. "We consider the accurate chronology of the Genesis as commencing only with the creation of man, and the first formation and chaotic state of the globe, as not included in any of the periods called days."²³ (That is, each of those "days" could be a whole epoch.)²⁴ As a Wernerian, Silliman believed the pre-Genesis earth was once entirely covered in water. However, earthquakes and other events drained the waters into enormous caverns. These, in turn, were shaken by earthquakes and "gaseous explosions," releasing water in gigantic deluges that could account for rocky deposits, therefore one needn't think solely of Noah's flood. Further, Silliman wrote, Hayden didn't consider the decomposition and fracturing of rock that explain the positions and nature of diverse rocky strata. Currently fascinated by experiments in galvanic electricity, and extrapolating from explosive results of battery contacts, Silliman thought "the un-intermitted activity of galvanic electricity, evolved by the juxtaposition of strata and fluids of different kinds, is probably a potent cause" of geological decomposition.

Hitchcock may not have accepted all of this speculation, but in his publications beginning in 1823, he followed Silliman's lead in positing whole eras for the "days" of Genesis, thereby allowing pre-Noachian time for the accumulation of geological strata. During the summer of 1820 he took notes (see above) on a lecture in which Silliman clearly stated his views of Genesis. From 1820 to 1822, the two men's letters give tantalizing hints about the problems Hitchcock faced as he tried to have science cohabit with theology. He had apparently told his colleagues in divinity that he believed modern science no longer permitted literal reading of the biblical account

¹⁸ "Hints on some of the outlines of geological arrangement, with particular reference to the system of Werner, in a letter to the editor, from William Maclure, Esq. dated Paris, 22d August, 1818," AJS 1, 3 (1819): 209-13. For a fuller account, see Appendix A, "William Maclure"

¹⁹ "On a singular disruption of the ground, apparently by frost, in letters from Edward Hitchcock, A.M. Principal of Deerfield Academy," AJS 1, 3 (1819): 286-90.

²⁰ Hitchcock, "Supplement to the 'Remarks on the geology and mineralogy of a section of Massachusetts, on Connecticut River, &c,' " AJS 1, 4 (1819): 436-39.

²¹ The contents of one sets of notes (EOH Box 18, folder 1) date it from May to July 1819; the other set is entitled "Notes A.D. 1819-20" (EOH Box 18, folder 2). Further dates are found in letters to John Torrey posted in New Haven on July 20 and November 25, 1819 (EOH Box 5, folder 25). See also Hitchcock to Silliman, 1.29.19.

²² Silliman 1820.

²³ Silliman 1820, p. 53.

²⁴ This view, traceable to Buffon in the previous century, gained currency with the Rev. William Buckland's *Vindiciae geologicae* of 1820. Buckland asserted that the six days of Genesis were to be taken figuratively, with whole ages between them and thousands of ages preceding them.

that both the earth and its creatures began with the Mosaic deluge. The Yale scientist supported Hitchcock that same summer by raising science above theologians ignorant of modern discoveries:

I think you got off well between Moses and the divines: the latter I suspect, were willing enough to get rid of the subject. I have become still more convinced of the truth of the new views and I am satisfied they will ultimately become general among men who are at once acquainted with geology and disposed to reverence the scriptures. No mere divine, no mere critic in language can possibly be an adequate judge of the subject or deserve unqualified deference, however able in other respects. (8.18.20).

Hitchcock needed this encouragement. Orthodox Christians were up in arms because geological discoveries increasingly pointed to rocky strata going back to far distant time, and therefore requiring a new calendar of the earth's history. Geological time challenged the conventional belief that the earth was only a few thousand years old. It wasn't easy for a young student of divinity to defy convention but unlike most fellow students, Hitchcock had dedicated himself to science before he was drawn to the ministry. In 1813 he had delivered a lecture that was a secular hymn of praise to science. Newton and modern science, he then wrote, overcame the damaging effects of Roman Catholicism; religion was weak and incomplete without the sciences.²⁵ He was then a Unitarian, but in 1816, probably chastened by two years of serious eye trouble, he returned to the orthodox view of his parents. This led him to study for the ministry at Yale but, as we have seen, he gave equal or nearly equal time to chemistry, mineralogy, and geology.

Devoted to the ministry, Hitchcock needed reasons for maintaining his scientific studies. It was natural theology that allowed both him and Silliman to bring theology and science together. Silliman rarely gave voice to this belief and presented himself primarily as a secular scientist, but Hitchcock openly took natural theology as the very foundation of his life's work. Natural theologians believed that empirical study of nature, based on Baconian reason, would lead to God because it located divine laws that regulated everything.²⁶ God set the laws of existence, but he wasn't the Deistic deviser of a mechanism. He intervened in history at critical junctures: after each of the antediluvial great extinctions (exposed by successive strata of rock), he recreated life in new forms. The advocates of natural theology affirmed that the Bible is the word of God and the source of moral truth, but they placed that affirmation in a historical framework. They argued that the Bible's authors couldn't have been aware of myriad facts that modern science had uncovered. Because these facts more fully reveal divine laws, science is, according to natural theology, the handmaiden of Christian belief.

For Hitchcock, natural theology enabled his work in science and in theology, but not without a struggle. While studying at Yale and serving as pastor in Conway, he worried about the competition between the two. Late in 1822 he posed to Silliman a heartfelt "case of conscience" (12.1.22). Science was so attractive to him that he feared it deadened his zeal for religion. If that were really the case, then perhaps he should give up science. Compared to Silliman's professional engagement with science, he pursued it "only relaxationally." Relaxation for this workaholic was exemplified in a number of scientific papers and lectures, so time-consuming in fact that one wonders how he served his church. A number of sermons survive in manuscript, but there is little evidence of his ministry to place alongside his scientific publications and his researches in geology and botany. Silliman, appealed to, responded by writing "I think that without doubt the ministry should be your main object but a collateral & recreative pursuit of science is certainly proper within proper limits." (12.5.22). He added that he "should be very sorry to lose" Hitchcock's scientific work and, indeed, the Conway pastor was one of the steadiest contributors to the American journal of science.²⁷

Except for Hitchcock's "cases of conscience" and Silliman's replies, their abundant correspondence concerns the younger man's scientific work and his contributions to Silliman's journal. While minister in Conway, he continued botanizing and geologizing in the Connecticut River Valley, logging many miles of close

²⁵ A manuscript headed "Delivered before the Society of Literary Adelpi, August 9th, 1813," in the Pocumtuck Valley Memorial Association library, Deerfield: Hitchcock family papers, Box 2, folder 9.

²⁶ The idea was most influentially propounded by Rev. William Paley whose *Natural theology* was published in 1802. For a discerning account of natural theology, see John Hedley Brooke, *Science and religion: some historical perspectives* (New York 1991), 192-225. Herbert Hovenkamp, *Science and religion in America 1800-1860* (Philadelphia 1978), 219, gives an excellent bibliography of natural theology in America.

²⁷ A year later, Hitchcock wrote Silliman about a second "case of conscience" (4.9.23). He worried about his name appearing alongside Cooley's in a joint publication of a botanical catalogue, because Cooley had fathered an illegitimate child and left New England in disgrace. In his reply (5.5.23) Silliman acknowledged that religious people wouldn't appreciate the juxtaposition of the two names, and suggested an anonymous publication. In 1829 (see below) Hitchcock published the catalogue under his own name.

observation documented in his submissions to Silliman's journal as well as in their correspondence. Limited to these letters, which scarcely ever mention religion, one would hardly think of Hitchcock as a Congregational minister! It's true that many clergymen contributed to the sciences, but none in his era has been shown to match Hitchcock's simultaneous productivity in mineralogy, geology, geography, and botany. He continued to spend time at Yale (7.23.22, 9.22.22) but the dates and lengths of his visits to New Haven in these years are unclear. In addition to Silliman, he knew John W. Webster, professor of chemistry and geology at Harvard Medical College, whom he visited in Boston. He exchanged mineral samples with him and with Chester Dewey of Williams College (a former student of Silliman). He also knew Eli Ives and James G. Percival, both at Yale, as well as the roving Amos Eaton and Thomas Nuttall. Moreover, from 1819 onward he maintained a steady correspondence with the esteemed New York botanist John Torrey, who was also a contributor to Silliman's journal.

Until 1823, botany took nearly equal place with geology in Hitchcock's avocational pursuits. He may have audited courses by Ives, professor of botany and materia medica at Yale, or he may only have sought his advice informally. In any event, in his manuscript notes of 1819 he listed the authors and titles of the most recent books on botany in "Prof. Ives' library," took liberal notes from them, and used them as sources when working on his herbarium in Deerfield.²⁸ From 1819 through 1822 he sent boxes of plant specimens and Orra White's watercolors to Torrey who helped him with his herbarium and with the catalogue of native plants that is frequently referred to in the Silliman-Hitchcock letters. Until Cooley left New England for Georgia in 1822, Hitchcock and he worked together on the catalogue after which Hitchcock continued on his own. He and Silliman often wrote about publishing it, but it was only in 1829 that Hitchcock separately put it into print.²⁹

Silliman didn't want Hitchcock to slight geology in favor of botany, and once, when the younger man had been working mostly on botany for a few months, he urged him not to abandon his work on the geology of the Connecticut River Valley (5.8.22). He need not have worried, but in the exciting post-Linnaean days when American flora was being freshly catalogued in the "natural method," the neophyte Hitchcock could hope to make a name by being the first to identify a plant. He was worried that the energetic Nuttall would beat him to the publication of some of the botanical evidence he was gathering along the Connecticut River (9.22.22, 10.17.22), but Nuttall was an excellent colleague and agreed with Hitchcock—so did Torrey—that a fern he had discovered was indeed a new species (11.6.22, 2.12.23). It was duly published in Silliman's journal³⁰ and modern science gave Hitchcock the accolade he sought by accepting the identification of "Botrychium simplex E. Hitchc." In thanks for the many debts he owed Silliman, Hitchcock was able to offer his mentor original observations and discoveries in addition to the botrychium. He sent the Yale scientist some helpful remarks on his published tour from Hartford to Quebec.³¹ His letter is lost, but from Silliman's response (2.14.21) we learn that Hitchcock referred to Cleaveland's geological treatise that Silliman had reviewed,³² and to the shortcomings of Werner's views. In effect Hitchcock had by now adopted much of Cleaveland's geology.

In that same letter Silliman mentioned fossil fish that Hitchcock had given him. These fossils, which Hitchcock gathered along the Connecticut River near Sunderland and Gill, amounted to a significant discovery. Silliman said that he would send the fish to Brongniart "& will mention you as the discoverer." He added that he would pay Hitchcock's workmen (presumably quarrymen) for more specimens. Two months later (4.9.21) Hitchcock sent more fish and alertly included specimens of "other organic beings" and of "the rocks above and below the petrifications" that could help identify the fish's place in the geological strata. In an appended list, he named the locations of thirteen specimens: "No. 2. Slate with one species of fish. No. 3. Same rock, another species of fish." Silliman was sure of the importance of the discovery, for he announced it in his journal.³³ Pursuant to Hitchcock's request, Silliman sent them for identification to Brongniart in Paris (4.21.21), thus Hitchcock first made contact, albeit indirectly, with contemporary European geology and nascent palaeontology, no mean feat for a neophyte.

Hitchcock's Sketch of the geology . . . , 1823-1824

²⁸ For the herbarium, see Herbert and D'Arienzo 2011.

²⁹ Hitchcock 1829. Listing 531 genera with 1440 species, it grew out of Hitchcock's teaching of botany. He thanked his "early coadjutors" Williams and Cooley, and also credited Torrey with help "in almost every part of the subject."

³⁰ Hitchcock, "Description of a new species of botrychium," *AJS* 6, 1 (1823): 103-04. White supplied a tiny watercolor for the article.

³¹ Silliman, *Remarks made, on a short tour, between Hartford and Quebec in the autumn of 1819* (New Haven 1819). In his second edition (New Haven 1824), Silliman refers several times to Hitchcock's geological work.

³² Silliman's anonymous review of Cleaveland was in the first issue of the *AJS* 1, 1 (1818): 35-52.

³³ Silliman, *AJS* 3, 2 (1821): 222.

Hitchcock's big project during these years was the geology of the Connecticut River Valley from the river's outlet in Saybrook to southern Vermont, culminating in three major articles that Silliman published serially late in 1823 and early 1824.³⁴ Until the last minute Hitchcock's botanical work was to be included. In early September 1822 he had incorporated botany in his presentation of his geologizing to the American Geological Society in New Haven. (He had been made member and one of three recording secretaries of this society when it was founded in New Haven in September 1819). However, his botanical researches were interlocked with the troublesome catalogue of native plants (postponed until 1829), and so omitted from the articles. Silliman had already published Hitchcock's early study of the river's geology in his journal's first volume (see above), but this was limited to Massachusetts. Because Silliman had already written about the geology of Connecticut, Hitchcock proposed that they collaborate on a study of the whole course of the river (8.6.21). Silliman demurred, ceding the project to his young colleague.

From the outset of his study of the river's course, which preceded his first encounter with Silliman, Hitchcock considered a map of the region to be the central document. He was aware that Maclure's map of 1809 had made its author famous, and a successor map, if only for a portion of New England, would be greeted as a major accomplishment. On it, with the aid of color-coding and annotations, he could embed his observations of geological strata and types of rock. By 1823 he wanted to improve his own relatively crude map that Silliman had published in 1818. The new map now covered a wider swath of the valley, thirty miles on each side of the river and its whole course from Long Island Sound to Vermont. The map was in its first redaction by early January 1822, when Silliman returned a proof of it to Hitchcock (1.7.22). With the help of his wife Orra, it was constantly revised. Eight months later, Silliman sent him another revision of the map, this time with corrections and additions for its southern region, plus a colored sketch and other emendations by James G. Percival. (8.2.22). In November Silliman sent further changes proposed by his engraver Amos Doolittle, so the map, colored and redrawn by Orra, was becoming a collaborative document. It was 21 x 9^{1/8} inches, with each of its fifteen rock formations (not just Maclure's four classes of rocks) given its own color.

During the weeks that intervened between the publication of each of the three portions of his "Sketch," Hitchcock assiduously studied the writings of contemporary scientists, among them Robert Bakewell, Brongniart, Cleaveland, George Greenough, John Macculloch, and Leopold von Buch. He also took account of the rival theories of Hutton and Werner which interested him far more than they did Cleaveland. He was especially drawn to the recent book by Rev. W. D. Conybeare and William Phillips, *Outlines of the geology of England and Wales* (London 1822), and in the fall of 1823 he offered Silliman a review of it.³⁵ "I feel it to be of importance that an analysis of that work be presented to American geologists. It seems to me that many facts & principles are there brought forward which will put somewhat of a new face upon our geological descriptions." (10.20.23).

By adopting Conybeare and Phillips, Hitchcock took a large step forward from Cleaveland. In his very favorable review, he showed his familiarity with the leading European and American writers by summarizing recent developments in geology. He referred to fossils of organic remains (including palaeotherium, megatherium and mastodon) that Cleaveland had ignored. Further, in an adjacent article he applied lessons from the two British authors to formations in New England's southeast, probably the first American geologist to do so.³⁶ In his willingness to adapt Conybeare and Phillips to American geology, he was putting his neck out before other geologists. In Silliman's journal the better known Eaton attacked his review with an excitable defense of the Wernerian system.³⁷ Eaton wrote that Conybeare's and Phillips's system couldn't be adopted in the US because it flew in the face of "known" observations (read: Wernerian names) of the upper strata of geological formations. Silliman invited Hitchcock (as the anonymous author of the review) to reply.³⁸ He accused Eaton of covering over objective observations with Wernerian hypotheses. To support Conybeare and Phillips, Hitchcock invoked the compatible views of John Macculloch which, he said, "are rapidly gaining ground."³⁹ He roundly defended European geologists as the formulators of recent geological knowledge. With a poke at Eaton, he wrote that "we are not willing to be warped by national particularities, or envious rivalries."⁴⁰

³⁴ Hitchcock 1823, "Sketch."

³⁵ Hitchcock 1824.

³⁶ Hitchcock, "Notices of the geology of Martha's Vineyard and the Elizabeth Islands," *AJS* 7, 2 (1824): 240-48.

³⁷ Eaton, "Ought American Geologists to adopt the changes in the science, proposed by Phillips and Conybeare?," *AJS* 8, 2 (1824): 261.

³⁸ Hitchcock 1825, pp. 146-54.

³⁹ Macculloch, *A geological classification of rocks, with descriptive synopses of the species and varieties . . .* (London 1821).

⁴⁰ Hitchcock 1825: 150.

In the final installment of his “Sketch,” Hitchcock classified and named rock formations according to Conybeare and Phillips who, he said, had “the rare merit of being entirely free from hypothesis.”⁴¹ Nonetheless, they favored the Huttonian hypothesis, and in his review he took a slight distance from Silliman whom he characterized as being “in the main a Neptunian.” (12.17.23). He acknowledged that he himself leaned toward the Huttonians but he didn’t entirely disavow Werner because he believed in both igneous and aqueous origins. “We are indifferent whether we are called Neptunians, or Vulcanists; and also, whether we have any general theory on the subject, or only some points of apparently contradictory theories. Just so far as undeniable facts lead us, we wish to follow; but no farther. We do not believe the time has yet arrived, in which it is possible to make any very extensive, correct generalizations in regard to the original formation of rocks.”⁴²

Hitchcock’s “Sketch” was a significant contribution to American geology. Proud of it, he published it in book form in 1824.⁴³ It was the most detailed study of the geology of a confined area yet to be published in the United States. Because it appeared initially in America’s major science journal, it gave Hitchcock a modest but definite place among American geologists. In it, he covered the river valley from Saybrook to Bellows Falls, Vermont, an area 30 by 150 miles. Although he paid attention principally to rock formations, he included detailed notes on native lichens, mushrooms, and phenogamous plants, and on fossil fish. To a modern reader, his most interesting passages are devoted to “Scenery” in the last of his three connected articles. In the Romantic era coincident with his early life, scientists, poets, and painters all looked upon natural forms as vehicles for inquiry and imaginative expression.

Hitchcock was drawn to the sublime, which was romanticism’s most exalted expression and which signals his devotion to the aesthetics of landscape that distinguish him from most fellow geologists of his era.⁴⁴ In thirty pages of “Scenery” Hitchcock described hilltop views from the Connecticut shore to Vermont, blending the picturesque and the sublime. He gave the view from Mount Holyoke his longest description, and observed that the river there and further south was once a prehistoric lake. “Hence he [the geologist] will be led to speculate upon the period when these waters began to subside, and upon the time requisite to wear away such immense masses of rock; and ere he is aware, his thoughts will be led back to the period, when the cataract of Niagara began its seven mile retreat, or when the deltas of the Mississippi and Ganges began to encroach upon the ocean, or even to that time when ‘all the high hills that were under the whole heaven were covered’ with a deluge.”⁴⁵ His most sublime view overlooked the Connecticut River from the bridge at Bellows Falls. “Every thing at this romantic spot conspires to impress the beholder with the idea of wild sublimity. . . . In the middle of the bridge I stopped and looked into the foaming stream below, where the ragged rocks, half seen amid the partial darkness, jutting out from the banks and shooting up from the bottom, presented a real Charybdis, devouring whatever entered its jaws.”⁴⁶

By welcoming such effusions, Silliman shared with Hitchcock the desire to enlist readers in an appreciation of New England landscape. In an article in his journal in 1820, he foretold Hitchcock’s 1823 “Sketch.”⁴⁷ He frankly distinguished his chatty account from scientific geology: “The manner is more diffuse and popular than the subject might strictly demand, but this course was adopted with the hope of alluring some degree of attention to the subject of geology, on the part of readers who might be repelled by a severer method.” Silliman’s article was a model for Hitchcock’s “Sketch” in more than one way, although it had no geological map and little of the younger man’s closely focused descriptions. Silliman had a romantic conception of nature which he passed on to Hitchcock, even if his prose was more subdued. He occasionally offered sublime views from particular vantage points. In a subsection entitled “Scenery,” he wrote of the view as he approached New Haven from the northwest: “On the left the magnificent ridges of secondary trap . . . stretching away North, farther than the eye can distinguish, and forming the barrier of luxuriant vallies, whose fine verdure is admirably contrasted with their naked and lofty precipices. . . .”⁴⁸ This charming article repeated some of the findings of a booklet he had published the year before in New Haven, *Remarks made, on a short tour, between Hartford and Quebec in the autumn of 1819*. It found a place among the slowly growing number of books dedicated to New England

⁴¹ Hitchcock 1823, “Sketch.”

⁴² Hitchcock 1824, p. 239.

⁴³ Hitchcock 1823, “Sketch.”

⁴⁴ Herbert 2010.

⁴⁵ Hitchcock, “Sketch,” 1823.

⁴⁶ Hitchcock, “Sketch,” 1823, pp. 12-13.

⁴⁷ Silliman 1820, “Sketches of a tour,” pp. 201-36.

⁴⁸ Silliman 1820, “Sketches of a tour,” p. 234.

tourism.⁴⁹ It was republished in London in 1822 and expanded in New Haven in 1824; this third edition had several references to Hitchcock's work on the Connecticut River Valley. By then Silliman was a well appreciated author of tourist guides; his memoir of his travels in Europe in 1805 and 1806 had also enjoyed three editions.⁵⁰

Hitchcock's Utility of natural history, 1823

The romanticism that Hitchcock shared with Silliman was even more fully expressed in a lecture—he called it a sermon—that he gave in Pittsfield in 1823, *Utility of natural history*.⁵¹ Once again it's worth noticing how surprisingly productive Hitchcock was. He was engaged in this ambitious piece while constantly reworking his "Sketch" and maintaining his duties as pastor. Both the "Sketch" and the lecture were separately published as brochures, so 1824 marked Hitchcock's arrival as a major practitioner of natural history in New England. The Pittsfield Lyceum of Natural History was founded in 1823 as a center for lectures, meetings, and scientific information; a year later Hitchcock was named one of its vice-presidents.⁵² At his lecture, Hitchcock faced an enlightened audience of farmers, town folk, and professionals who would have appreciated the high level of his discourse during which he quoted verses from James Beattie, Ann Radcliffe, and William Cowper, and referred to Alexander von Humboldt and several other scientists. His listeners wouldn't have thought it unusual to be addressed by an ordained minister, for many leading scientists were also Protestant clergymen, including Hitchcock's colleague Chester Dewey (named president of the Lyceum in 1824), and such distinguished British geologists as Conybeare and Buckland.

In his Pittsfield lecture, Hitchcock pursued two main themes: the importance of natural history for all aspects of life, and the ways in which natural science supports religion. Released from the "nervous diseases and debilities of present life," nature lovers would find themselves moving "with quickened steps into the pathless valley; along the margin of the stream, or the lake; through the deep and solitary forest, and up the steep and rocky mountain . . ." The naturalist, with passionate curiosity, "scans the varied flowers; seizes the curious mineral; observes the brilliant insect tribes, and listens to the tuneful birds."⁵³ He is also the ideal tourist for, as in Silliman's writings and his own "Sketch," *Utility* foretold the vogue for nature tourism in New England that swelled in the 1830s. Although Hitchcock praised the exploration of nature "merely as a source of pleasure, and not from a restless desire of distinction," he unwittingly confessed his ambition to be distinguished for his discoveries in botany and mineralogy. Posing one who, like Humboldt, abandoned civilization for remote climes, he remarked that "the hope of acquiring fame may, indeed, be a powerful spur in such cases to the naturalist, as well as to the artist; but it is difficult to account for all his devotedness, without supposing within him a strong relish for the beauties of nature, independent of all selfish feelings."⁵⁴ Hitchcock's love of nature's beauty, his devotion to the botany and geology of his native landscape and not to some generalized nature, was indeed the bedrock of his whole career.

Natural history tends, likewise, to increase, in its votaries, a love of country. The fields over which we have wandered, the valleys we have explored, and the mountains we have climbed, will always be dearer to us than any other fields, any other vallies [sic], or any other mountains. It is truly astonishing, how vividly the recollection of a particular mineral or plant is associated, in the mind of the mineralogist or botanist, with the scenery of the spot where they were first collected by him. There is a bewitching charm, too, in that spot, that causes him, ever afterward, to look back upon it with a sort of affection.⁵⁵

Following many encomiums upon natural beauty, the second half of *Utility* turned to the proofs that "natural science, properly pursued, supports religion."⁵⁶ "Sketch" was an entirely secular document, but in *Utility* Hitchcock deployed the whole range of his thinking as one who was devoted equally to religion and to science. Drawing upon Paley, he wrote that to give credence to divine power, one needs to look within the vastness of

⁴⁹ For the rapid expansion of tourism in New England in the coming decades, see Dona Brown, *Inventing New England. regional tourism in the nineteenth century* (Washington 1995).

⁵⁰ Silliman, *A journal of travels in England, Holland and Scotland . . . in the years 1805 and 1806 . . .* (New Haven 1810), republished in Boston in 1812, and New Haven (much enlarged) in 1820.

⁵¹ Hitchcock 1823, "Utility."

⁵² At a meeting of September 1824. See *AJS* 9, 1 (1825): 177.

⁵³ Hitchcock 1823, "Utility," pp. 12-14.

⁵⁴ Hitchcock 1823, "Utility," p. 17.

⁵⁵ Hitchcock 1823, "Utility," p. 13.

⁵⁶ Hitchcock 1823, "Utility," p. 20.

heaven and earth which can be marveled at but not readily comprehended. It's instead close study and identification of individual plants, animals, and minerals that reveals God's remarkable "contrivance, design and benevolence." For a natural theologian, the pursuit of science is therefore god's work. This viewpoint wasn't readily accepted by traditional Christian thinkers, who were alarmed because contemporary geology, by disclosing ancient rock formations, appeared to deny biblical time. Hitchcock was taking a courageous stand by saying that the Noachian deluge couldn't be understood as the one great catastrophe that explains all. Yes, the great deluge took place about six thousand years ago but, although it was only then that god created humans, the earth was already eons old as shown by the successive layers of ancient rock.

It's hard to exaggerate the passions stirred by the Mosaic controversy in the first half of the nineteenth century.⁵⁷ Many theologians who believed the Bible's words were literal truth viewed science as an attack upon the meaning of Noah's flood in Genesis. In 1823 Silliman cautioned Hitchcock not to write about "the connexion of the Mosaic chronology & geology" in an article he was contemplating for the *Christian Spectator*, because its readers wouldn't give him a fair hearing. (5.5.23). Hitchcock's Pittsfield sermon was addressed to a lay audience but even so he needed courage to engage openly in the Mosaic controversy. When he first told Silliman about the lecture "in which I came out with the new views in regard to the first chapter of Genesis," he apologized for defending himself by referring to Silliman's lectures. "My statements must be propped up by some good authorities or they will be disregarded since our divines generally do not, as you have remarked, understand even the elements of the subject." (10.20.23). He adopted from Buckland and Silliman the view that the six days of Genesis need not have been twenty-four hours each, but periods of "considerable length" that allowed for the slow development of earth forms. Here he distanced himself from the typical American distrust of European geology voiced by Maclure, Eaton, and many others. One must agree, he wrote, with European geologists who separate the Mosaic story of the creation of humans from the creation of the globe, which took place in the vast extent of geological time. His "good authorities" included the recent book by Conybeare and Phillips that he had favorably reviewed. By adopting their system, Hitchcock held advanced views that put him out in front of most other American geologists. For Hitchcock, these two writers were among European geologists "whose grand object is the collection of facts, and who are extremely cautious of hypothesis; adopting none, except such as seem absolutely necessary to explain appearances."

Buckland's *Reliquiae diluvianae*

Hitchcock summarized his lecture in a phrase that defied the conservative opposition he anticipated: "every candid man must regard geology as affording a triumphant support to the sacred historian."⁵⁸ The most influential statement of this position was given by Buckland in his *Reliquiae Diluvianae* published in 1823.⁵⁹ He was the holder of major clerical positions and probably the most prominent geologist in Great Britain in the 1820s. Alerted to his book by British reviews, Hitchcock agreed to Silliman's proposal that he review it for his journal. He was predisposed to admire it because Buckland put his authority as both minister and scientist behind the reconciliation of science and religion—Hitchcock's lifelong ambition.

In a cave in Yorkshire, Buckland had identified the fossil remains of antediluvian hyenas, covered over by deposits of ancient mud become stone. In careful analysis he showed that organic life and destructive floods had been present before the Noachian deluge. He retained the biblical flood as the origin of human life; in fact, science proved this. In his review of Buckland, Hitchcock attacked the recent book by Granville Penn that claimed science was opposed to religion.⁶⁰ Buckland, he wrote, proved that first came the antediluvian era with no fossils; then the diluvial era with fossils; then the next era whose mud (in the Yorkshire cave and elsewhere) covered over the fossils in a deluge—the Noachian deluge. This sequence conforms to the Bible. No human life was found among fossils, so humankind was created by god in the wake of the biblical deluge. That flood was of relatively short duration, but there were earlier catastrophic deluges, proved by the valleys carved out by rushing waters. Hitchcock agreed with Buckland that only such catastrophes (glaciers and earth upheavals, as we now know) can explain how diluvial rocks and fossils reached the tops of mountains. Hitchcock believed that American geology would eventually vindicate Buckland when caves in the west were explored.

⁵⁷ In the 1850s, in the wake of his *Religion of geology* (1851), Hitchcock continued to be assaulted by conservative ministers for his reconciliation of modern science and theology.

⁵⁸ Hitchcock 1823, "Utility," p. 27.

⁵⁹ Buckland 1823.

⁶⁰ Hitchcock, review of Buckland, *AJS* 8, 2 (1824): 150-58, 317-38, referring to Penn 1822.

Buckland caused a real stir among American geologists. Hitchcock had used Silliman's copy of the expensive book (in his review he lamented its cost), and was then asked to pass it on to Eaton. For the next two years it circulated among Silliman's and Hitchcock's colleagues. For Hitchcock, Buckland's treatise not only formed a model conciliation of science and religion, it also expanded his awareness of the complicated workings of the earth's crust and the role of fossils in dating geological strata. The sequence of his readings and adoptions put him on the cusp of paleontology and stratigraphy via the widening conceptions of geology. For him these were first based on Cleaveland, then furthered by Conybeare and Phillips, and now in 1824 by Buckland. Hitchcock wasn't engaged in the kind of geological findings that were giving Eaton fame, but no American geologist was more advanced than he in the comprehension and communication of the latest ideas in the field.

Eaton, for his part, was at last gaining the attention he had long sought. In the spring of 1824 he announced in Silliman's journal the near completion of the first phase of his geological survey of the route of the Erie Canal.⁶¹ This was a capital piece of field geology that elevated Eaton to prominence. Silliman reviewed it favorably later that year, paying special attention to its large geological map.⁶² Eaton's ambition went beyond his stated subject, for his map extended from Lake Erie eastward to Boston. Its substantial cost, like that of his geological work, was paid by his patron Stephen Van Rensselaer. The eastern portion of the map was provided by Hitchcock who accompanied it, as Silliman wrote in his review of Eaton, "by a concise description, furnished by him, not (as we understand) with a view of having it published in its present form, . . ." Silliman was aware that Hitchcock had sent with his map some informal remarks to Eaton that he didn't want published, and that Hitchcock thought Eaton had printed deliberately to embarrass him (see below, "Amos Eaton"). Animosity between the two continued in another form, as we have seen, in Eaton's rejection of Hitchcock's endorsement of Conybeare and Phillips. Hitchcock's objections to Eaton's inclusion of rocks not along the Erie Canal, and to his coining of new names for already known minerals and rocks, were seconded in a review of the Erie Canal survey by Chester Dewey.⁶³ Although Dewey commended Eaton, he complained about his "affecting some needless novelties in technical language," and urged him to consider Conybeare and Phillips in future work.

Silliman was well aware of Eaton's patent desire for fame. He told Hitchcock that he had sent Eaton a letter of "censure" (12.27.24) but he was too circumspect an editor to take sides publicly. He continued to publish letters and articles by Eaton right through the decade, an acknowledgement of the Troy scientist's accomplishments and his prominence. He also continued to publish articles and letters from the peripatetic Maclure who was in any case too important a patron to ignore (see below, "William Maclure"). Maclure's contributions to the American journal of science in the 1820s show that he was rapidly falling behind current geology. He railed against the theorizing of European geologists and insisted that American geologists were superior by virtue of sticking with observable facts.

All through the 1820s, Silliman made his journal a clearing house for the sciences. Only rarely did he publish communications from abroad, including excerpts from Brongniart with whom he regularly corresponded.⁶⁴ However, his colleague John Griscom, a chemist at Queen's College (later Rutgers), surveyed European publications for Silliman, in "Foreign Literature and Science," a department he edited right through the decade. Griscom didn't editorialize but kept readers abreast with short accounts of most developments across the Atlantic.⁶⁵ In addition to Maclure and Eaton, Silliman favored men of his own and the younger generation: his close friend, Philadelphia's Robert Hare, Boston's J. W. Webster, Williamstown's Chester Dewey, and New York's John Torrey. Hare wasn't given to theory at all but was a prodigious deviser of laboratory equipment. Silliman regularly published Hare's inventions, illustrated by engravings that Hare sent him. Chief among them was the oxy-hydrogen blowpipe whose intense heat let Silliman and Hitchcock reduce minerals to constituent elements. Over the decade, Silliman published Hare's constant improvements upon instruments of galvanic electricity, the "deflagrator," a battery whose terminals produced blazing heat and light, and the "calorimotor," a voltaic battery whose large plates created high heat. Silliman used both instruments as did Hitchcock after he began teaching.

Hitchcock was one of Silliman's most prolific authors: eighteen articles between 1818 and 1825 (and thirty-four more from 1826 to 1863). Connecticut River geology dominated but he sent articles on botany, on distinctive wintertime phenomena, on mineralogy, several reviews of books on geology and astronomy, and one

⁶¹ Eaton, "Progress of the Geological Survey on the Grand [Erie] Canal," *AJS* 8, 2 (1824): 195-98.

⁶² Anonymous [Silliman] review, *AJS* 8, 2 (1824): 358-62.

⁶³ Dewey, "Notice of Prof. Eaton's geological survey of the district adjoining the Erie Canal," *AJS* 9, 2 (1825): 355-56.

⁶⁴ Excerpts from Brongniart in *AJS* 1, 1 (1818-19): 71-74, and 3, 2 (1821): 216-27.

⁶⁵ Griscom had spent two years in Europe in 1818 and 1819, and there met many notable scientists including Brongniart, Davy, Berzelius, and Gay-Lussac.

short piece on a geological hammer that intrigued Silliman. (It incorporated more than one tool, a primitive forerunner of Swiss army tools.)⁶⁶ At one point Silliman told Hitchcock that “lovers of other branches might complain” if he accepted too much from him (10.27.22). While still a pastor in Conway, Hitchcock associated with a whole phalanx of contemporary scientists. These included many of the American contributors to Silliman’s journal. He talked geology with a number of them at the annual meetings in New Haven of the American Geological Society, which he served as a vice-president. In April 1825, for example, he joined other officers of the Society, including Maclure, still the president, and Cleaveland, Gibbs, Hare, Silliman, and Webster. He exchanged mineralogical specimens with Silliman, Dewey, and Webster, and had access to Webster’s collection as well as to Gibbs’s famous mineral “cabinet” that was the nucleus of Yale’s collection.

For a rural pastor, Hitchcock was remarkably cosmopolitan. In his reviews of Buckland, Conybeare and Phillips, he readily adopted most of the latest views of British geologists despite the adverse opinions of Eaton and Maclure. His willingness to accept new ideas is evident in his reaction to the writings of John Finch, an English geologist living temporarily in America. In a lecture before the Academy of Natural Sciences in Philadelphia in July, 1823, subsequently published by Silliman,⁶⁷ Finch argued persuasively that fossils of identical age permitted the identification of the same strata in Europe and America. The so-called “alluvial” strata in the eastern US as described by Cleaveland and Maclure, were contemporary with the newer secondary and Tertiary formations in Europe and elsewhere. Finch described Tertiary formations in Martha’s Vineyard, Long Island, New Jersey, and elsewhere, the first to do so. “Geology will achieve a triumph in America, when the term alluvial shall be banished from her Geological Essays, or confined to its legitimate domain, and then her Tertiary formations will be seen to coincide with those of Europe”

Hitchcock wrote Silliman (11.25.23) that “The essay of Mr. Finch in the last No. of the Journal on the Tertiary questions is very important & interesting. He has anticipated many of my remarks in the Review [of Conybeare and Phillips] & especially in a sketch I am making out of the geology of Martha’s Vineyard. I think his hints will put a very different aspect on our geology.” In his article on Martha’s Vineyard that Silliman published that same fall, Hitchcock showed just how current he was. Using the terms of Conybeare and Phillips he described a “Plastic Clay Formation” on the Vineyard that Finch’s article identified with the Tertiary in England. Therefore Maclure’s “alluvial,” Hitchcock wrote, “can no longer be considered such, in the modern sense of that term.”⁶⁸

“Modern sense” was Hitchcock’s domain. In one issue of the American journal of science published in June, 1825 (most articles dated 1824), he contributed four articles and two short notes. This was a productive burst of scientific writing on the eve of his accepting a professorship at Amherst College. In a botanical article, he made one of his rare references to divine wisdom among his many secular articles in Silliman’s journal. After a careful description of the complex valves which discharge the spores of a recently identified fungus, he concluded by saying that “in this mere fungus, which, to the passing traveller appears to be a disgusting mass of half decayed vegetable matter” was in fact “evidence of contrivance and design, as is calculated to lead the thoughts irresistibly to a Great First Cause.”⁶⁹

An article in that same issue took Hitchcock back to his boyhood studies of astronomy and mathematics. He reviewed the recent treatise of a British astronomer, Francis Baily, laying out the author’s method with several pages of detailed mathematics. “And when the calculator sits down to apply the principles of spherics to his observations, he finds his mind pleasantly sustained through the most laborious processes, by a peculiar enthusiasm, that makes him forget the dryness of the mere arithmetic that is concerned.”⁷⁰ In another submission to the same volume of Silliman’s journal, Hitchcock displayed his cosmopolitanism and his argumentative capacities. Here he took Eaton to task for objecting to Conybeare’s and Phillips’ findings and for clinging to Wernerian concepts while pretending to avoid “theory.” He regretted Eaton’s reluctance to accept recent European findings and cautioned against “national partialities.” He frankly declared that “We do not, however, wish to conceal the fact, that we regard Europe, rather than America, as the centre of geological science Eur. geologists have been at work far longer than Americans, have many more specialists and collections.”⁷¹

⁶⁶ “New mineralogical hammer, by Rev. E. Hitchcock, A.M.,” AJS 7, 1 (1824): 175.

⁶⁷ Finch, “Geological essay on the tertiary formations in America” AJS 7 (1824): 31-43.

⁶⁸ Writing to Hitchcock on April 6, 1824, Silliman added “Mr. Finch in a recent letter desires me to express to you his thanks for the handsome notice which you have taken of his piece on Tertiary formations.”

⁶⁹ Hitchcock, “Physiology of the gyropodium coccineum,” AJS 9, 1 (1825): 56-60.

⁷⁰ Hitchcock, “The new method of determining the longitude by the culmination of the moon and stars,” AJS 9, 1 (1825): 107-15.

⁷¹ Hitchcock 1825, pp. 146-54. See also Appendix B, “Amos Eaton.”

Hitchcock's willingness to engage with new European conceptions of geology didn't mean that he ignored the most fundamental kinds of research on this side of the Atlantic. Two notes that round out his six contributions to the American journal of science in 1825 dealt with mineral deposits. In one he re-identified as spodumene a mineral recently said to be white augite, and described other minerals he found in Massachusetts. His shortest appearance in the 1825 issue was a one-page description of a specimen of Topaz.⁷² Silliman's letters show professional caution, for he had excluded topaz from Hitchcock's previous article until he could examine it with the blow-pipe. He was largely confident in his young colleague, but if this topaz didn't bear out (it did) he feared that colleagues "will come down on me." (2.19.26). Silliman made room in nearly every issue of his journal for letters and articles that gave specific locations of minerals, mostly in the northeast but occasionally in the midwest and south of the country. In the early years of geology, these locations were essential building blocks for the gradual assemblage of geological knowledge. Hitchcock was a frequent contributor in this regard, and was the first to report on several minerals found in New England: chabazite, titanium, tin, and topaz. The latter figured in a dozen letters exchanged with Silliman from 1824 to 1826.

Hitchcock at Amherst College

By January 1825, Hitchcock's dedication to geology reached a new stage. While a minister with a large flock he had amassed a significant collection of geological and mineralogical specimens, some 1200 in all. Further, he had arranged and labeled them in what he conceived to be a new manner. "I have never seen any cabinet arranged exactly according to this plan & therefore I mention it." (1.24.25). Competition with his ministry was so keen that he told Silliman he was sorely tempted "to change my mode of life entirely."⁷³ As we saw, this tension was already evident three years earlier when he posed Silliman his "case of conscience." Now, in 1825, he was offered a professorship at Amherst College. Silliman said that he should consider it favorably for a pastor can easily be replaced and "the situation of a Professor although arduous has many more alleviations than that of a clergyman." He urged him to accept for the sake of his health. (4.14.25), an appeal that let Hitchcock absolve much of his guilt at renouncing his pastorate. That summer Silliman offered lots of advice, chiefly about limiting the range of courses he would teach. (7.27.25); he thought Hitchcock should apprentice himself to an experienced person.

Silliman's letter was tantamount to an offer of help, so after resigning as pastor in October 1825 to accept a professorship at Amherst College, Hitchcock and his wife spent the autumn and early winter in New Haven where he could study chemistry with Silliman. His Yale mentor added to his services by making him one of his lab assistants. In that capacity he worked with another assistant, Silliman's nephew Benjamin D. Silliman. Together they analyzed a Connecticut specimen of topaz, and published the results in Silliman's journal.⁷⁴ At the end of January 1826, the Hitchcocks moved permanently to Amherst where Edward took up his post as professor of natural history and chemistry. In mid-March Orra gave birth to their second living child Catherine; their daughter Mary was then two years old. Circumstances were difficult, but Hitchcock was cobbling together his lab equipment and supplies, much of it secured with the aid of Silliman and his nephew.⁷⁵

As professor of natural history, Hitchcock was expected to teach zoology, botany, mineralogy, and geology, as well as chemistry (listed under natural philosophy). He left his pastorate behind, but not religion. In addition to frequent preaching to the college community, he devoted Thursday afternoons to classes on the Bible, "taking care to bring out the leading objections to skepticism."⁷⁶ From this phrase, we know he taught natural theology from the vantage point of the "new views" that reconciled science and religion (and Paley's Natural theology was a required text). One of the college's stated aims was to prepare students for the ministry, so they were never allowed to doubt that Hitchcock kept religion at the center of his professorship. He often gave sermons on Thursday evenings, and he and his wife regularly invited students over for prayers and informal discussions every Monday evening.

From 1825 to the end of the decade it's chemistry that looms largest in Hitchcock's and Silliman's letters. Only occasionally do they mention religion, although its importance was always assumed. For his teaching

⁷² Hitchcock, "Topaz," AJS 9, 1 (1825): 180. Silliman added a paragraph stating that he examined the specimen with the blow-pipe and found it very like the specimen from Siberia in the Gibbs collection.

⁷³ Undated letter written between Jan. 24 and April 14, 1825 (EOH, box 5, folder 14).

⁷⁴ Hitchcock and Benjamin D. Silliman, "Topaz, Laboratory of Yale College, Jan. 10th, 1826, to Professor Silliman," AJS 10, 2 (1826): 352-58.

⁷⁵ Detailed in letters from February 19 to the end of March 1826.

⁷⁶ Hitchcock 1863, *Reminiscences*, p. 296.

Hitchcock was least well prepared in chemistry, which of course is why he had sought out Silliman. With some trepidation he gave his first lectures in April. “I eat my chemistry & drink my chemistry & sleep upon my chemistry.” (4.18.26). For several months he was limited to temporary quarters while a laboratory was being built in a new multi-purpose building that housed the chapel, library, lecture rooms, and several offices. Provision was made in the lab for “furnaces, cisterns, gasometers, and apparatus.”⁷⁷ It was partly underground, and Hitchcock felt his health was damaged by the “mephitic” vapors he could only vent through open doors and windows.

For his lab and his lectures, Hitchcock was very dependent upon Silliman, an extremely generous mentor. Repeatedly the Yale professor arranged the purchase of supplies and lab equipment for Hitchcock and offered him detailed practical advice. (4.22.26, 7.28.27). Their letters reveal just how a chemical laboratory was constituted in the 1820s, and should interest historians of science. On one occasion Silliman urged Hitchcock to practice chemical experiments privately, ahead of time, lest he face embarrassment (7.27.25), an injunction that Hitchcock later recalled as a cardinal rule of teaching.⁷⁸ Only a few days after beginning his lectures, he reported to Silliman that his experiments had been successful. “Not more than one or two unimportant ones out of more than fifty have failed. The reflectors of radiant caloric although often worked admirably burning phosphorus as far as I tried them.” (4.18.26).

“Radiant caloric” refers to heating a metal plate with the calorimotor. From the first issue of his journal Silliman had championed the use of the calorimotor and the deflagrator. Illustrated articles in his journal by his friend Robert Hare gave instructions for both batteries, and Silliman reported on their uses there and in his letters. Hitchcock used these galvanic instruments to analyze minerals and rocks. Dissatisfied with batteries he purchased with Silliman’s help, he decided to make his own instruments, even to the casting of their metal parts. (12.30.27). Galvanic electricity was one of the scientific wonders of the decade, so Hitchcock was keeping in step. (Following Silliman, he also used Hare’s oxy-hydrogen blowpipe to reduce minerals). There was always the risk of accidents in experimenting with electricity. Silliman, who already had explosions in his lab, warned Hitchcock to be careful after learning that he had had an accident with his galvanic apparatus. (6.4.28).

In fact, at first Hitchcock’s chemistry lectures were patent imitations of Silliman’s. Toward the end of his first course he “hurried rapidly” over the subject but he hoped to attend Silliman’s lectures to prepare himself better. (7.8.26). He spent the late winter of 1827 at Yale, auditing Silliman’s course on the chemistry of metals. Dependent though he was, he can’t be called a slavish imitator of the Yale savant. He invented his own heat sink in soapstone and used it for more than one purpose by fashioning one of its faces for the casting of zinc plates for his batteries. (11.30.27). Silliman thought well of it. (6.4.28). With his colleague Jacob Abbott, who taught natural philosophy, Hitchcock devised a hot air balloon for his chemistry classes. Activated by the flame from an alcohol-soaked sponge, it traveled two miles at two thousand feet before it gave out.⁷⁹ This aerial adventure is the only sample we have of Hitchcock’s teaching outside the classroom but we know that he conducted frequent field trips and was bent on new ways of instruction. In 1827 he wrote Silliman that he had begun teaching via “the method of instruction by subjects rather than by pages of a text book.” (10.28.27) He was here departing from his mentor who indeed taught with the pages of his constantly revised textbook.

Teaching the sciences preoccupied Hitchcock beginning in the spring of 1826, but he continued what today would be called “multi-tasking.” In 1827 he gave a major public lecture on the benefits of science to agriculture, immediately published in a pamphlet.⁸⁰ He told his audience of farmers and townspeople that the newly advanced sciences of chemistry, botany, and geology offered new support for agriculture. Facing a general aversion to what was often derisively called “book farming,” Hitchcock sang the praises of science and urged farmers to ignore astrology, which he relegated to Milton’s “Paradise of Fools” (Paradise Lost). To his cultured audience he also quoted Pope to good effect, and ended his lecture with twenty verses on the rewards of agriculture from Virgil’s *Georgics*. He made only a perfunctory invocation of god in this address, but his audience knew he was a minister as well as a professor. A year after this secular appeal, Hitchcock made clear his fervent religious convictions when he published a polemic in which he opposed the idea of Unitarians and Calvinists sharing “pulpit services.”⁸¹ Unitarians are brothers, sisters, and neighbors, but they’ve embraced a “fatally erroneous” system of religion, and “our duty is to point to their errors so that they can be saved.” The Orthodox should withhold their fellowship from Unitarians. No mention of science appeared in this tract.

⁷⁷ Hitchcock 1863, *Reminiscences*, p. 73.

⁷⁸ Hitchcock 1863, *Reminiscences*, p. 288.

⁷⁹ Hitchcock, “Rarified air balloons,” *AJS* 12, 2 (1827): 372-73.

⁸⁰ Hitchcock, *Scientific agriculture, an address delivered before the Hampshire, Franklin, & Hampden Agricultural Society; at Northampton, Oct. 24, 1827* (Amherst 1827).

⁸¹ Anonymous [Hitchcock], *Pulpit exchanges between the Orthodox and Unitarians* (Boston 1828).

Hitchcock surely thought that he valued religion and science equally, as he made evident while teaching natural theology in Amherst College. However, he continued to put them into nearly separate realms in his publications. A year after his Pulpit exchanges, he published a decade of botanical investigation in a catalogue of native plants.⁸² He thanked his “early coadjutors” Williams and Cooley, but he greatly enlarged the catalogue since he had ceased exchanges with them in 1822. Students could find references to standard sources for each of 1447 species. For rare plants, the catalogue “points the student to the particular places in this vicinity where he may find them. And, finally, it may serve as a very convenient index to an Herbarium; since, for this purpose, it is only necessary to mark with a pencil, against the name of a plant in the catalogue, the page of the Herbarium where a specimen of it is placed.” Hitchcock’s catalogue still today has value as “an essential document for understanding both the flora and the development of botanical sciences in the Connecticut Valley region of western Massachusetts in the early 19th century.”⁸³

From 1826 to 1829, Hitchcock’s teaching, lecturing, sermonizing, and publications left him less time than prior years to contribute articles to the American journal of science. He sent Silliman four articles, three of them about the locations and nature of minerals. In one he identified a specimen of chlorophoeite he found in Turner’s Falls, and appealed to readers to send him European specimens of fossil-bearing rocks in exchange for several kinds of American minerals.⁸⁴ A second article is more ambitious. In fifteen pages he described a number of minerals he examined in Massachusetts and Connecticut over several weeks in 1827. It was a walking tour, a travel diary reminiscent of Silliman’s earlier tours.⁸⁵

The fourth article in this span of four years involved him more substantially in current geology. He gave Silliman a lengthy review of a book on the geology of North Carolina by Dennison Olmsted, a former student of Silliman whom Hitchcock knew.⁸⁶ He gave generous excerpts and described Olmsted’s findings, praising the book very highly. Twice he expatiated on the wisdom of Olmsted’s state for providing funds for his survey, adding his own recommendation that other states do the same. “How worthy the genius of our governments to have an accurate geological map, with an accompanying report, accessible to all our citizens! Individual naturalists are indeed doing much towards the accomplishment of such a work; but the pleasure derived from scientific discovery is almost their only reward; and without patronage, they cannot for many decades of years accomplish the enterprise.”⁸⁷ (This foretells Hitchcock’s own appointment in 1830 as state geologist in Massachusetts.) He thanked Olmsted for sending him sample specimens which he had examined. He added his observations to those of the author, disputing him in one case by writing that his own examination told him that Olmsted’s mica slate was really Macculloch’s quartz. Tellingly, he made it clear that he appreciated Olmsted’s avoidance of theory. “For he thus makes us acquainted with the rocks themselves, as they exist in the arrangement of nature; which is of far more importance than to ascertain where they should be placed in the system of Werner.”⁸⁸ This gratuitous poke at Werner is a token of Hitchcock’s evolving ideas about geology and the origins of the earth.

Scrope and Cordier: the fiery earth, 1825-1829

In 1825 and 1827, two impressive texts challenged Werner and the Neptunians. The first of these was by the British geologist George Poulett Scrope, *Considerations on volcanoes, the probable causes of their phenomena. . . leading to the establishment of a new theory of the earth* (London 1825). Silliman reprinted lengthy portions of an anonymous British review of this book that stressed Scrope’s findings about the mechanisms of volcanic eruptions caused by the earth’s fiery central heat, the distribution of volcanos in chains, the nature of lava, and the need to accept vast eons of time to explain erosion.⁸⁹ Only toward the end of the article does the reviewer explain Scrope’s over-arching theory. Scrope, he wrote, deduced directly from volcanos and earthquakes

⁸² Hitchcock 1829.

⁸³ Burk 1994, p. 92.

⁸⁴ Hitchcock, “Chlorophoeite. (From Professor Edward Hitchcock),” *AJS* 10, 2 (1826): 393-94.

⁸⁵ “Miscellaneous notices of mineral localities, with geological remarks; by Prof. Edward Hitchcock,” *AJS* 14, 2 (1828): 215-30.

⁸⁶ Hitchcock 1828, pp. 230-51.

⁸⁷ Hitchcock 1828, p. 231.

⁸⁸ Hitchcock 1828, p. 237.

⁸⁹ Anonymous 1828 For a brilliant analysis of Scrope see Martin J. S. Rudwick, “Poulett Scrope on the volcanos of Auvergne: Lyellian time and political economy,” *British journal for the history of science* 7,3 (1974): 205-42. Rudwick shows that Scrope was more advanced than his contemporary and rival Charles Daubeny, and that he developed ideas of deep time at the center of Charles Lyell’s far more famous and influential *Principles of geology* (London, 3 vols., 1830-33)

(and not from general Huttonian theory) “the existence of this central heat and elevating power” and gave “conclusive evidence of the laws under which it acts; and goes on to show, that such a power must, in the nature of things, have given rise to those elevations of continents and mountain ranges, with all the minor phenomena of inclined and distorted strata, dikes, veins, faults, etc.”⁹⁰ Silliman interjected an occasional remark of his own showing that he was still a latter-day Wernerian, straddling old views while acknowledging the attraction of new ones. “When mines are occupied by water, there is said to be no evidence of heat, but on the contrary, the temperature is lower. The hypothesis of a central heat does not therefore appear to derive support from this source, although we think it would not be difficult to prove that there are physical causes . . . to justify us in believing that ignition may at any time be generated in the bowels of the earth.”⁹¹

Two years after Scrope’s publication, the French geologist P. L. A. Cordier read his “Essai sur la température de l’intérieur de la terre” at the Académie des Sciences. By studying many mine shafts, Cordier proved that the temperature of the earth rose steadily with depth, leading to the conviction that the interior of the earth was a fiery molten mass. Scrope had said this, but Cordier now gave more conclusive evidence. Thomas Cooper fairly laid out Cordier’s thesis in the American journal of science.⁹² Cordier, Cooper wrote, taught that “whatever may be the nature of the forces, or the astronomical even Essai sur la température de l’intérieur de la terre” at the Académie des Sciences ts, which have anciently troubled the stability of continents, and produced that general dislocation and overturning which the crust of the early exhibits, we may easily imagine that all parts of this crust floating on a fluid mass, and infinitely subdivided by stratification, and above all by the innumerable contractions which cooling has produced in each layer, may have been dislocated and overturned as we actually see has been the case.” The crust of the earth is flexible and as it cools, its contractions produce earthquakes and volcanoes which release flows of lava. Cooper apparently thought that Cordier dealt a blow to Werner’s idea of aqueous fluidity of the globe and gradual solidification of the crust by crystallization in water. “The Neptunian hypothesis was in articulo mortis before he [Cordier] wrote; it is now consigned to the resting place ‘of all the Capulets,’ never to be revived.” (p. 131).

However, Cooper can’t quite leave Werner behind. He objected to Cordier because he adduced no proof that the earth’s crust is always in contact with the igneous interior and further, no proof that Werner’s “prodigious cavities” (they supposedly held subterranean waters) didn’t exist. He followed this reasoning from a negative by unwisely claiming that “The rumbling noise under ground, attending earthquakes, indicates hollow places.” He also disputed Cordier’s assumption that heavy metals would be in the center of the earth, again claiming that there is no evidence for that supposition. “All Cordier’s most ingenious hypothesis (for theory it can hardly be denominated) may be true, but it wants farther proof that it is so. The action of steam, and the explosion of gases of decomposed water, seem, to us, as yet the most probable cause of volcanic eruptions.” Silliman, who commissioned Cooper’s review, exhibited his own Wernerianism in some appended remarks of his own. He rejected Cordier’s assertion that great heat lies in the fluid center because even there heat wouldn’t need to be greater “than the red heat of iron.”

Hitchcock, for his part, was so struck by Cordier that as soon as he received his publication (6.27.28), he set his students to translate it as *An essay on the temperature of the interior of the earth*, “Translated from the French by the Junior Class in Amherst College” (Amherst 1828).⁹³ In his preface to this 94-page pamphlet, Hitchcock summarized its central finding: below the earth’s crust there is “a fluid mass of melted and ignited matter—a mighty abyss of liquid fire.” He said that he didn’t avow “a settled belief in so remarkable an inference” but he was obviously largely won over because “an air of probability is thrown over the hypothesis.” In a supplemental note, he added that Cordier was supported by evidence that fossil vegetables in northern latitudes came from an earlier climate “congenial to tropical plants and animals.”

Once again Hitchcock was ahead of most American geologists. Silliman had recently restated his Wernerianism by publishing a short article on a piece of wood found within a conglomerate rock. He assumed the wood was floating in Werner’s primeval ocean and was captured when the rock was precipitated from the

⁹⁰ Anonymous 1828: 134.

⁹¹ Anonymous 1828: 120. For a brilliant analysis of Scrope see Martin J. S. Rudwick, “Poulett Scrope on the volcanos of Auvergne: Lyellian time and political economy,” *British journal for the history of science* 7,3 (1974): 205-42. Rudwick shows that Scrope was more advanced than his contemporary and rival Charles Daubeny, and that he developed ideas of deep time at the center of Charles Lyell’s far more famous and influential *Principles of geology* (London, 3 vols., 1830-33)

⁹² Cooper, “Analysis of an ‘Essai sur la temperature de l’intérieur de la Terre, par M. Cordier,’” *AJS* 15, 1 (1829): 109-31 (p. 130). In the following pages, Silliman announced with praise Hitchcock’s Amherst translation of Cordier.

⁹³ “Done nominally by the Junior Class—but I had to go over the whole to prevent mistakes.” Hitchcock 1863, *Reminiscences*, p. 386. At the end of Cooper’s review Silliman announced the Amherst translation of Cordier, directed by “the able and active Professor of Chemistry, Mineralogy, &c in that institution.”

waters.⁹⁴ Eaton was similarly trapped in the Wernerian ooze. In the same issue of Silliman's journal, he defended Werner's classification "because I cannot discover any advantages in the proposed alterations. I adopt Bakewell's name for volcanic or basaltic rocks. And I prefer the old general application, Detritus, to Tertiary formation."⁹⁵ Maclure was equally immune to the appeal of recent European geologists. He objected to Scrope's proof that the earth's center was in molten heat. Common sense, he wrote, told him that the earth gets colder with depth, and that earthquakes are caused by "elastic gases, arising out of the fermentation of large masses of vegetable matter."⁹⁶

Hitchcock published anonymously his own rather lengthy review of Cordier and Scrope in April 1829.⁹⁷ In his enthusiasm for them he parted from Eaton, Maclure, and Silliman. He accepted Scrope's and Cordier's "idea of internal heat and fluidity" that constituted "the fundamental element of a new Theory of the Earth; though in fact it is very analogous to the views of Hutton." This theory "supposes a vast volcanic agency to have been in operation from the creation; much more active and powerful in early times than at present." Cordier wrote that in the gradual cooling of the earth, the crust would contract and subject the hot internal fluid to immense pressure which then produced volcanic upheavals. Hitchcock still believed in one basic Wernerian concept, namely that the earth's continents once constituted the bottom of the primeval ocean. However, Werner posited that rocks were precipitated in the waters which then had to subside so as later to uncover them. "There is no evidence of any such diminution of the waters," Hitchcock wrote. Instead an enormous Huttonian force pushed the continents upwards as is shown by inclined and bent strata. The present oceans were what remained of the ancient Wernerian waters after the Huttonian upheavals.

This view allowed Hitchcock to adopt Cordier's and Scrope's theses without utterly denying Werner. He maintained this view all his life, and so did Silliman, but he wasn't Silliman's clone. The latter, in 1828, took up the work of the British geologist Charles Daubeny in a two-part review.⁹⁸ Daubeny's work and Silliman's interjections are largely limited to detailed descriptions of volcanos around the world, using ancient and more recent documents. Only at the end of the second article does Silliman, speaking for himself, broach theoretical ideas. After invoking the divine Creator, he wrote that in the earth's interior, the mixtures of elements and intense chemical and voltaic action, produced "great commotion" when "heat, light, electricity, and magnetism, and attraction in various forms" produced violent fissures in the earth's crust. The crust would then re-form, and the process would be renewed. Scrope's and Cordier's fiery molten center therefore could be ignored.

Hitchcock referred to Silliman's review toward the end of his article in the North American review. After praising Silliman's article, he objected to some of its "peculiar views." Silliman wrote, Hitchcock said, that at the earth's origins, "uncombined combustibles and metals," colliding with waters, created great commotions of steam, vapors and gasses whose violence would produce "fissures and caverns, dislocations and contortions, and obliquity of strata" Further, Silliman proposed that different layers of metals and other substances constituted a vast voltaic battery with enough power to explain earthquakes and volcanoes. Hitchcock objected because J. J. Berzelius showed that no metals except potassium and sodium will "take fire by contact with water." So Silliman's hypothesis is "peculiarly unsatisfactory." "The novelty and grandeur of this idea would incline us to adopt it, did we not feel that the supposition of central heat and fluidity was more in accordance with facts, and less incumbered [sic] with difficulties." He concluded by saying that "We have no desire to conceal our present partiality for the theory of igneous internal fluidity."

Curiously, Hitchcock, author of Pulpit exchanges the previous year, didn't mention religion or God in his article, whereas Silliman made the conventional references to divine authority in his piece on Daubeny. However, later in 1829 Hitchcock addressed the religious implications of the new ideas in a review of Scrope and Cordier for the Christian spectator.⁹⁹ To their books he added Silliman's Outline of geological lectures given in Yale College (New Haven, 1829). For this article Hitchcock put on his ministerial robes in a striking departure from the secular tone of his piece in the North American review. His two reviews, published only half a year apart, exhibit the persistent and disconcerting split between his religious and his secular presentations. Of course for him this

⁹⁴ Silliman, "Domestic" notice, AJS 14, 2 (1828): 393-94.

⁹⁵ Eaton, "Geological nomenclature, classes of rocks, &c.," AJS 14, 2 (1828): 359-368 (p. 362).

⁹⁶ "Remarks on the theory of central heat in the earth and on other geological theories; in letters addressed to the Editor, by William Maclure, P.A.G.S.," AJS 15, 2 (1829): 382-86

⁹⁷ Hitchcock 1829, "Essai," pp. 265-94.

⁹⁸ Anonymous (Silliman), "Notice and analysis of 'A description of active and extinct volcanos, with remarks on their origin' . . . by Charles Daubeny . . .," AJS 13, 2 (1828): 235-310, and AJS 14, 1 (1828): 70-91.

⁹⁹ Hitchcock, "Review of works on the structure of the earth," *Christian spectator* 11, 9 (Sept. 1829): 464-81.

was a normal way of taking account of his two different audiences, but nonetheless it reveals a disturbing willingness to don two utterly different costumes at different times.

For readers of the *Christian Spectator* he recapitulated his favorable reception of Cordier and Scrope from previous publications, but he carefully couched his presentation on constant references to divine authority. For this he made artful use of Silliman, quoting him frequently to prove that a Christian scientist could see the compatibility of the Bible with new geological theories. All geologists, he wrote, should begin as Silliman did by acknowledging divine creation and the moral truths of the Bible. He praised him for his “deference to moral and revealed truth” in contrast to Cordier, who didn’t even mention morality or religion, and still greater contrast with Scrope who made the mistake of objecting to the “supernatural.” He didn’t openly dispute Silliman as he had in the North American review article, but a careful reader would see that he sided with Cordier and Scrope more fully than did his Yale mentor. He fudged differences with Silliman by saying that he thought it best “not to be in haste in taking sides in geological controversy” and by crediting the Yale scientist with insisting that scientific inquiry must be regulated by the principle of God’s glory; that modern geology was actually compatible with the Bible if one reasoned carefully. Hitchcock was more on his own when he wrote that the biblical conflagration of the earth could well happen either from “the natural operation of the central heat [that is, Cordier’s molten interior], or from the special interposition of the Almighty.” The present crust of the globe could eventually be “broken up by the bursting forth of these subterranean fires” so that “a globe of liquid fire would alone remain.” As scripture predicts, the molten mass would then cool, and the whole process would be renewed to create a new earth and heaven.

Silliman and Hitchcock in 1830

In 1829 and 1830 Silliman prepared two new texts in the fields that were giving him increasing fame, one on geology, the other on chemistry. He brought together his current views of geology in a lengthy appendix to Robert Bakewell’s *Introduction to geology*.¹⁰⁰ In a letter to Hitchcock (2.9.29) he said that his appendix could stand alone in a separate binding. Cognizant of Hitchcock’s earlier criticisms, he told his younger colleague that “we are not very wide apart about the dominion of fire & water & I have not entered into any critical discussion about Genesis, choosing rather to trust to the facts to gradually bring the criticism right than to provoke a controversy.” In fact Silliman acknowledged that he was still a Wernerian, even though he accepted certain features of the new theories of the earth’s internal heat. This, however, he didn’t interpret in Conybeare’s and Phillips’ terms, nor in Hitchcock’s. If the earth’s molten metallic interior were confirmed, he wrote, then this “appalling conclusion” would influence him, but he proposed instead that subterranean “voltaic or galvanic powers” produced the heat that caused “volcanic steam” to elevate the lava.

According to Silliman the creation of the earth’s materials, but not their arrangement, was indeed instantaneous; its crust was only gradually formed. Werner’s primitive ocean that covered the whole earth contained acids and active agents that dissolved rocks, so that the primary formations granite, gneiss, and mica slate were deposited on the bottom and solidified by the pressure of the deep waters. These then awaited the violent reactions of heat, derived from electrical powers, with water. “There can be no doubt that Water is a great agent in producing Volcanos.” As George Merrill pointed out, this uncomfortable mixture of Wernerian and Huttonian left no ready explanation of the comings and goings of water in relation to the continental masses.¹⁰¹ In an article on traprock a year later, Silliman maintained his modified Wernerianism, allowing “aqueous origin of trap in some cases,” and yet one had “to admit its igneous origin in many.”¹⁰²

Silliman’s introduction to Bakewell overlapped with his textbook on chemistry, *Elements of chemistry*. He spent much more time on it than on Bakewell, and set great store by it. Hitchcock commented frankly on its pre-publication proof (Silliman included him in his published acknowledgments). He objected to what he termed its “old method of arrangement” and vainly hoped that Silliman would divide his subject into “simple bodies according to their electrical characters and arranging them in a few natural subdivisions according to their physical characters (exigr. gases – non-metallic metals).” (8.1.29). He had adopted this arrangement which was superior for the instruction of beginners. Perhaps, he suggested, Silliman could add an index that pointed to his pages according to J. W. Webster’s manual (Webster 1826). This proposal was ignored but Hitchcock said he would adopt Silliman’s chemistry for his Amherst classes, and also his appendix to Bakewell. Silliman’s

¹⁰⁰ Bakewell 1829. Silliman’s added a 127-page appendix of his own. In his editions of Bakewell in 1833 and 1839, Silliman substantially revised his appendix.

¹⁰¹ Merrill 1924, p. 123-24.

¹⁰² Silliman, “Igneous origin of some trap rocks,” *AJS* 17, 1 (1830): 119-32.

preoccupation with his publications on geology and chemistry didn't diminish his attention to the American journal of science. Faced with news of a rival journal which worried him,¹⁰³ he redoubled his efforts to increase subscriptions and was able to tell Hitchcock (1.10.30) that he had succeeded so well that he could begin to offer fees for submissions.

Hitchcock's contributions to Silliman's journal were no longer as frequent as in the earlier years. He sent only one article a year from 1827 to 1830. In 1829 he announced the first discovery of tin in Massachusetts, proven by several tests which included the use of Hare's oxy-hydrogen blowpipe.¹⁰⁴ To discover whether or not his specimen "would give the crackling sound, so striking in metallic tin, I placed it between my teeth; and upon pressing it between them, I was surprised at the distinctness with which this property could be perceived." Not long afterward he was pleased that Silliman sent him \$5 for his article (1.24.30). He must have been even more pleased a few months later when the Yale scientist made him a flattering proposal. A group of citizens of Wilkes-Barre invited Silliman to visit the region's anthracite deposits at their expense. Hitchcock accompanied him, and they set out in mid-May for a trip of a few weeks. Silliman subsequently reported upon the coal in that region of Pennsylvania but from the outset he was thinking of a broader enterprise. He made Hitchcock an engaging proposal. "I think you & I (to compare great & small) as Conybeare & Phillips did may jointly produce in the course of some years a work both elementary & also a digest of North American Geology which will do good. You undertake certain parts & I others & thus appear jointly with our initials upon [?] respective parts if you choose. It is desirable therefore that we see as much together as may be & I am anxious to look over Penna. with you." (5.9.30).

Silliman was alert to Hitchcock's advanced knowledge of European geological theories and he was aware that his junior colleague had been diligently investigating the geology of the Connecticut River Valley. In his letters the younger man had told him that he had returned to his map that Silliman had published in 1823, reworking it to account for his recent discoveries. He was bringing the description of New England's geological strata up to date, and was preparing an article for him (1.24.30). Silliman could therefore count on Hitchcock's being current. As it turned out, however, the two never collaborated on a geological text. Hitchcock was off on his own in 1830 because he had been commissioned by the Massachusetts legislature to produce a map of the state accompanied by a survey of its resources. This important project (he may perhaps have lobbied for it) preoccupied him until its publication in 1833.¹⁰⁵

Looking back from 1830

To end the first portion of this study of Hitchcock and Silliman with the year 1830 is admittedly arbitrary, but it's a logical time to pause before tracing the two men's interactions after that year. It was the last year in which Silliman published a major scientific work, while for Hitchcock it signaled a sudden rise in esteem when he was appointed state geologist. Silliman was then far ahead of his younger colleague in fame. He was one of America's foremost scientists, a professor known well beyond his institution's walls, well-reputed in Europe, and editor of the country's premier journal of science. He had published travel books that displayed his cosmopolitan awareness of national and international cultures, including the arts. In 1830, for example, he treated his journal's readers to two long articles on American architecture that gave moral underpinnings to the burgeoning Greek Revival.¹⁰⁶ He preferred its frank Grecian "simplicity" to European "luxury." Tasteful objects and architecture will lead to "a refinement of taste, an elevation of mental character . . ." Silliman had become what today would be called a "public intellectual." By contrast Hitchcock had no equivalents to his mentor's publications and no recognition in Europe. He had to await his 1833 report on the state's geology before his own reputation moved up a significant notch.

Reading through the American journal of science from 1817 to 1830 tells us a lot about the two men's views of geology, but little about their private lives and beliefs. Surprisingly, given Hitchcock's pastorate and his weekly preaching at Amherst College after 1825, he rarely mentions religion at all in Silliman's journal. One

¹⁰³ Rumored in 1829, George Featherstonhaugh's *Monthly American journal of geology and natural science* was eventually published in Philadelphia in twelve issues gathered in one volume, 1831-32. See Hitchcock to Silliman, 5.12.29.

¹⁰⁴ Hitchcock 1829, "Tin," pp. 188-91.

¹⁰⁵ Hitchcock 1833. In his journal in 1832 Silliman published the first portion of Hitchcock's draft of this report, so the expansive book had a preview before its publication the next year.

¹⁰⁶ Silliman, "Architecture in the United States," *AJS* 17, 1 (1830): 99-110, and *AJS* 17, 2 (1830): 249-73. This was an ardent manifesto of neoclassicism (more Greek than Roman), including public and private buildings, city planning, and cemeteries. His contrast of "simplicity" with "luxury" is a hidden parallel between American geologists' praise of "facts" over the theorizing of Europeans.

might think his ardent Calvinism would bring forth expressions of his beliefs, but he reserved these for his sermons and for articles in Christian journals. The absence of religion in his scientific articles could let some readers unaware of his biography assume that the spiritual life was unimportant to him. Few of them would have imagined the crises of conscience he lay before Silliman in 1822 when the competition between science and religion had become acute, and again in 1825. However, by 1826 Hitchcock could count on his students and New England contemporaries being aware that he brought religion and science together in his teaching and publications on natural theology. In writings on science he would have felt no need to voice views of which he knew most of his interlocutors were well aware of. Nonetheless, his often stark separation of science and religion is more than a hint of an unresolved inner life. By contrast, Silliman, in his articles on science and in his editorial comments, consistently voiced his conventional Protestant belief, although without elaboration.

Like most professional men of their era, Silliman and Hitchcock were reluctant to put feelings into their communications. Exception may be made for Hitchcock's hypochondria which he frequently revealed, but otherwise little is glimpsed in their letters about home life, acquaintances, institutions and environs. Family news was broached only once. Hitchcock informed Silliman in 1824 of the death of his first-born son, aged two. (3.17.24). Silliman's reply is an unusual instance of a heartfelt emotional response. (3.20.24). He and his wife also had lost their first child in infancy, and three other infants before 1823. In several sensitive paragraphs he tried to console the Calvinist Hitchcock by saying that a child is too young to bear moral responsibility, and that God's sacrifice on the cross cancels an infant's "original taint."

Despite the fact that the daily lives of both men were absorbed by their college environments, we seldom get a glimpse of campus life in their letters. Hitchcock's flaming air balloon (see above) is the only token we have of a life beyond the classroom. Silliman once faced a less welcome circumstance. He wrote Hitchcock about student protestors who had left campus (or been ordered to leave), and whose fates would be judged one by one. (8.8.28). Hitchcock's reply was suitably ironic. "I suppose a rebellion in so large an Institution as Yale is as necessary now & then to clear away the rubbish & bad air of a College as volcanoes & thunder are to purify the atmosphere. I believe that the theory of John Calvin explains the cause of such rebellions better than Cordier or Scrope or Daubeny have done in respect to volcanoes. I trust that your atmosphere will be much more clear & pleasant since the eruption." (8.16.28).

Although Silliman and Hitchcock were equally scholars and teachers, their roles in the 1820s had been quite different. Hitchcock remained within the realm circumscribed by teaching, preaching and writing reviews and articles, but Silliman moved on a broader terrain. As editor he welcomed a wide array of scientists, most of whom he knew. They contradicted one another or manifested jealousies but he managed their contributions in an urbane manner that let him provide an outlet for nearly all contemporaneous ideas in the sciences. His contributors were mostly Americans, but major Europeans were accounted for in reviews of their work by Hitchcock and others, as well as in a regular department of "foreign intelligence." Silliman's patrician upbringing, his studies abroad, and his upperclass position gave him an aplomb that the provincial and sometimes brusque Hitchcock lacked. On occasions Silliman's willingness to give air to all and sundry new scientific disclosures led to amusing results. Usually the dispassionate and rational scientist, he declared his belief in sea serpents in 1827 when he endorsed a witness account of maritime beasts, and again two years later when he declared his continued faith in these creatures despite publishing a scientific refutation of such apocryphal animals.¹⁰⁷ At times his enthusiasm for galvanic electricity, a veritable leitmotif of his articles, reviews, and editorial commentaries, seems like a personal quirk especially when, as Hitchcock noted, it flew in the face of more persuasive conceptions. Nonetheless, one has to admire the sheer breadth of Silliman's journal which was the principal clearing house for the sciences in the United States from 1818 onward for several decades.

Hitchcock's acceptance of the latest European theories right through the 1820s is the most significant finding from surveying the American journal of science. He had the luxury of being warmly encouraged by Silliman and had no need for the circumspection of an editor. He could write with enough objectivity to be convincing but also with a critical and sometimes partisan voice, making pleas for points of view that Silliman didn't feel free to express openly. In 1817, on the eve of meeting Silliman, he favored the recent work of Parker Cleaveland over earlier geologists. Five years later Conybeare and Phillips took him further from Wernerian conceptions, followed shortly after by his enthusiasm for Buckland who demonstrated the use of fossils to date geological strata, while ardently asserting the role of divine intelligence. Then in 1828 Cordier (who embraced Scrope's recent deductions from volcanic studies) struck him with nearly the power of revealed truth: the fiery

¹⁰⁷ Silliman, introductory remarks to "Sea serpent," *AJS* 12. 2 (1827): 375-76, and Silliman, note appended to "The history of sea-serpentism, extracted from Samuel L. Mitchill's summary of the progress of natural science within our United States..." *AJS* 15, 2 (1829): 351-56.

molten interior of the earth caused upheavals of the rocky crust and determined the formation of the continents. Werner's Neptunism was forced to retreat further, leaving only the idea that remnants of the global primeval waters were found in the world's oceans.

With his reviews over the decade, he introduced Silliman's readers to a succession of major treatises from Conybeare and Phillips to Cordier, and therefore helped prepare the way for Charles Lyell's revolutionary writings of 1830-1833. Just how advanced Hitchcock was is readily shown by comparing him with notable contemporaries. As we saw, Silliman clung to Werner by granting water a critical role in volcanic activity. He even imagined extraordinary subterranean galvanism to explain volcanic upheavals, leading Hitchcock to regard these views as "particularly unsatisfactory." At least Silliman gave an airing to Cordier's vulcanism, accepting much of his theory, but the two most famous geologists of the era, Maclure and Eaton, were more stubbornly Wernerian. A good measure of Hitchcock's uniqueness is found in the comparisons with those two men that I've separately made in appendices devoted to them. Maclure had stopped making geological inquiries in the early 1820s, but Eaton had no such excuse. His retreat from the findings of Conybeare and Phillips, Scrope, and Cordier, is more than petulance because it characterized his writings and teachings until his death in 1842. It should be said that, like Maclure and Silliman, he had a public record to defend and it wouldn't have been easy to admit ideas that undermined that record. Hitchcock was at another point of career: that of a younger man who was still searching, still without a publicly stated position to defend, and therefore free to assimilate new conceptions.

Part Two: Hitchcock's prime decade, 1831-1841

The correspondence of Hitchcock and Silliman from 1831 to 1841 documents a significant change in the two men's relationship. In that decade Silliman reached new heights of fame. He wasn't an original thinker but an influential one through his editorship of the American journal of science, his teaching, his writings, his outside lectures, and his cordial relationship with many of the major scientists of Europe and America. He became known as a professional consultant to private industry and to government. His textbook *Elements of chemistry* (1830-1831) and his two editions of Robert Bakewell's *An introduction to geology* (1833 and 1839) were widely adopted. His supplements to Bakewell kept him in the center of the continuing controversy among Christians about geology's supposed conflict with Genesis. Beginning in 1834 he also became known to broad audiences (sometimes over 1000 at one sitting) when he gave public lectures in New England and New York.

As for Hitchcock: before 1831 he had only a modest reputation, based largely on his articles and reviews in Silliman's journal. After 1830 his openness to new ideas continued undiminished and he published works of more original and substantive weight than any of Silliman's contemporaneous writings. In 1833, his survey of the geology of Massachusetts gave him instant national recognition and it was also favorably remarked upon by a number of British geologists. Three years later his publication of Jurassic footmarks in Silliman's journal drew more attention to him on both sides of the Atlantic; it contributed to an international flowering of paleontology. In 1840 he was elected chair of the newly founded Association of American Geologists, followed a year later by publication of his Final report, the third and much rewritten survey of state geology, the largest star on his crown as a leading American geologist. His own contributions to Silliman's journal from 1831 to 1841 were minimal—no reviews of others' work, and only four substantive articles—but the proof of his high place is shown by the journal's twenty-two references to his work over the decade, including favorable reviews of his major publications by Silliman and his son Benjamin Jr. Hitchcock seconded Silliman's views on the Mosaic controversy, but as a theologian and ardent Calvinist, he expressed himself in more polemical terms in sermons and articles in the Christian press.

In Part One, I often commented on the content of the American journal of science, a logical by-product of the letters which mostly referred to Silliman's publication. However, by 1831 the journal had outgrown its rather naive early days, with its often provincial and homely inclusions. Now, dominated by articles of substance from leading scientists, it had reached a high professional plateau and my commentaries would seem superfluous. Moreover, most of the publications by both men were independent of Silliman's journal, and will be discussed without much regard to it. For details about many scientists, publications, and events I'm going to defer to the letters themselves which I've extensively annotated. I'll again proceed chronologically through the two men's publications and accomplishments. The Mosaic controversy takes on renewed urgency, but with the signal difference that Silliman dealt with it in his scientific publications, whereas Hitchcock kept religion largely out of his own published geology. Instead he elaborated it in several articles for the religious press. I'll eventually compare the two men's religious views, but first I want to point out some of the characteristics of the letters and the variety of things one can learn from them.

Neither man disclosed much of himself in missives that were couched in reserved professional language. Hitchcock sometimes voiced his hypochondria, and there are occasional references to their wives, but otherwise little personal reflection marks the correspondence. On occasions Silliman, unlike the sober Hitchcock, enlivened his letters with humorous asides. He once acknowledged his execrable handwriting (a burden for the transcriber!) by asking Hitchcock to excuse "my hieroglyphics worse to decipher than your bird tracks" (April 14, 1838), and refused the suggestion that his name be attached to a newly discovered footmark, "for my long name tacked on to those long toes would indeed drag its slow length along" (September 23, 1841).

Intimacy isn't to be expected in the two men's letters, for they were more colleagues than close friends. Silliman's higher place in professional, urban, and cosmopolitan life stands out against the younger man's provinciality, but far from preening himself on this difference, Silliman was extraordinarily generous and forbearing. He responded faithfully to Hitchcock's incessant demands for the loan of books. Sometimes, when he knew that Hitchcock was facing a deadline, he sent books before he himself had read them. He regularly boosted his Amherst colleague by frequent laudatory references to his work in the American journal of science and by introducing him to American and European colleagues whom he urged to visit Hitchcock in Amherst.

Silliman had a much larger acquaintance than Hitchcock; he spoke particularly warmly of Charles Daubeny, Gideon Mantell and Charles Lyell (all three visited both Americans). He defended Lyell's *Principles of geology* against a polemical reference Hitchcock made to him in one of his articles in a Christian journal.¹⁰⁸ With

¹⁰⁸ See Silliman to Hitchcock, 3.6.37, and below, pp. 55-56.

more justice, Hitchcock expressed dislike of the Anglo-American geologist George Featherstonhaugh who repeatedly attacked Silliman in the short-lived journal he founded in 1831, *Monthly American journal of geology and natural science*. Jealous of Silliman and his journal, which he wished to supplant, Featherstonhaugh attacked him repeatedly, hiding behind invented British scientists. Hitchcock's warm defense of his Yale colleague became easier when Featherstonhaugh made the huge blunder of declaring with fanfare that he had discovered a fossil rhinoceros: it proved to be merely a piece of sandstone.¹⁰⁹

Among other things, the letters show that the two men, proper New Englanders, were indeed thrifty. Paper then was relatively more expensive than subsequently, so instead of using envelopes, they folded and sealed their single sheets so that the reverse side bore the address. Furthermore, they often wrote on the resultant flaps so that every surface was covered. Once (April 12, 1834) Silliman wrote on the flaps of a letter received from Hitchcock two years earlier, then readdressed it to Amherst. Because they applied wax seals directly to the paper, holes were left when they were pried loose; these tears often thwart the reading of a complete word or sentence. Letters, books, prints, and mineral specimens were frequently sent by stage, to be fetched at the local stage office or, from 1835, by canal boat, and eventually, from 1840, by rail. Sometimes packages were dropped off in Hartford to be picked up in person or by an intermediary. Often the writers avoided mail charges by having their letters delivered by acquaintances traveling between the two cities.

The two colleagues didn't record the charges for sending mail by the several conveyances they used, but they unknowingly contributed to economic history of the New England publishing industry in the 1830s by detailing the costs of paper, printing, and the hand-coloring of maps.¹¹⁰ In 1831, 600 copies of sixty-four pages printed in New Haven cost \$139.20. Paper of good quality then cost \$4 per ream, and of medium quality, \$3. Costs are given for paper per sheet, for lithographic stones, for printing and for coloring per page. In New Haven, Sarah Doolittle, daughter of the printer Amos Doolittle, charged \$5 per hundred for coloring Hitchcock's map by hand in 1832. Hitchcock worried that this was inadequate, especially since Sarah had just lost her father. "As to the price of coloring I have only to say as I have said that I must leave that for you to fix upon. I have only to say let no injustice be done to an orphan child & that child too a female." (May 4, 1832). All these costs varied between New Haven, Amherst, and Boston, reflecting those cities' different standards of living, and explaining why Hitchcock preferred Amherst: its charges were the least.

Silliman in 1833

Silliman's letters and the *American journal of science* in the early 1830s give abundant evidence of his familiarity with the latest writings of European geologists and paleontologists, including Robert Bakewell, Aimé Boué, the Brongniarts (father and son), Buckland, De la Beche, Beudant, Conybeare, Léonce Elie de Beaumont, Daubeny, Lyell, Mantell, John Phillips, and Adam Sedgwick. He edited American editions of Bakewell and Mantell, and exchanged specimens with the Brongniarts and Mantell. In the 1820s, although he reported on his European colleagues' work, he seldom incorporated their most recent findings in his own geology. However, as the 1830s progressed, he began to absorb lessons from them, and gradually shed some of the Wernerian ideas that had characterized his appendix to Bakewell's *Introduction to geology* (New Haven 1829). There he had resisted adopting Cordier's theory of the earth's hot interior and its "appalling conclusions," and he continued to believe that the Noachian deluge, though not the first such "universal flood," produced many of the features of the earth's surface.

Silliman found comfort for his belated Wernerianism in John Phillips's *Illustrations of the geology of Yorkshire* (London 1829), which he reviewed favorably in his journal in 1832.¹¹¹ The Noachian deluge still had great power, but it occurred after earlier deluges and "after stratification of earth was completed." Before Noah, parts of earth were dry and inhabited by land animals, as proven by fossils. Indeed fossils loomed larger in this account than Silliman had granted in his appendix to Bakewell three years earlier, for Phillips and he were now aware of the profound implications of paleontological discoveries. Silliman agreed with Phillips that granite hadn't been precipitated from the primeval ocean, as Werner taught and as Silliman had stated in 1829. He admitted that granite was of igneous origin, although he continued to believe that some "primitive rocks" had been

¹⁰⁹ See letters the two men exchanged from June 17, 1831 to August 6, 1835. In the latter letter, Silliman objected to Featherstonhaugh's styling himself (thanks to a government commission) as a "United States geologist" by saying that he himself might be "entitled to strut as *U. States Saccharist*" because he had published a report on the sugar industry (Silliman 1833).

¹¹⁰ See Silliman to Hitchcock, 1.23.31, 2. 24.32, 5.7.32, and 11.13. 35, and Hitchcock to Silliman, 1.31.32, 5.4.32 and 7.16.32.

¹¹¹ AJS 21, 1 (Jan. 1832): 1-26.

subjected to “the dissolving agencies” of the “incumbent ocean.”¹¹² He nonetheless backed away from Werner by giving up the idea that water was the principal agent in volcanic eruptions. Still resistant to the concepts promulgated by Werner’s Huttonian opponents, both he and Phillips objected to Lyell’s theory that posited cumulative effects of causes over vast times rather than the sudden and violent effects of “diluvial” and volcanic action. Silliman ended the piece by a phrase invoking “the immeasurable works of God!”

At the end of 1833, Silliman published Bakewell’s fourth London edition of his *Introduction to geology*, to which he added a revised and extended appendix. Bakewell himself had revised his 1829 edition, incorporating lessons from recent discoveries of fossils by Mantell and others. He disavowed Werner’s system, but to Hutton’s he preferred the ideas of the late James Hall about the formation of valleys because Hall allowed for irregular upheavals of the crust as well as for the actions of rivers and floods. Lyell’s theory wasn’t mentioned. At one point Bakewell wrote that “electric currents are passing through the earth and are important agents in many subterranean phenomena. Perhaps the different beds of rock which environ the globe may act like a series of plates in the voltaic pile, and produce effects commensurate with their vast magnitude.”¹¹³ However, he limited himself to this bit of speculation, and didn’t give electrical energy the vast importance accorded it by Silliman.

Silliman entitled his revised appendix to Bakewell “Consistency of geology with sacred history.” God loomed much larger here than in Bakewell’s own text. The British geologist wrote that the days of Genesis were successive epochs “of indefinite duration,” but he paid no attention to the Mosaic deluge and only made perfunctory mentions of the Creator. In his appendix, as its title suggests, Silliman devoted many pages to the Mosaic controversy. After the initial creation, when the state of the planet’s materials can’t be known, the present crust of the earth was formed before the onset of the epoch of Genesis. The “days” of Genesis were periods of great length that correctly gave the sequence of the earth’s changes that modern geology has proved. Biblical Hebrew can be interpreted in such a way that geology is reconciled with Moses despite the seeming contradictions of biblical language. The ancient Hebrews were certainly adults in religion but “children” in learning and science, so their language isn’t commensurate with scientific findings after the era of Moses. Although modern Christians therefore need not see conflict between Genesis and geology, Silliman thought that ordinary church-goers were not adequately informed.

In the pulpit . . . geology can be but very imperfectly explained, even by him who understands it; for it’s impossible that he should here, intelligibly and adequately exhibit his proofs; they rest on a multitude of facts unknown to a common audience. . . . it’s therefore wise . . . not to disturb the early and habitual impressions of the common people, or even of the enlightened, who are ignorant of geology. Any discussions before such audiences, and in such circumstances, will be misunderstood, or not understood at all, and will only prejudice the reputation of the speaker, without benefiting the hearer.¹¹⁴

Why did Silliman interject at great length his religious concerns? No doubt he was reacting to the strong current of revivalism that surged in the early 1830s in New England. He was typical of Americans who, unlike the British, felt called upon to assert their religious convictions. Religious fervor was markedly on the rise at Yale, as Silliman informed Hitchcock (3.20.31), and this was true also in Amherst. Given Hitchcock’s preoccupation with the Mosaic controversy, Silliman would have anticipated his friend’s pleasure upon reading his new appendix. He might even have had him in mind when he warned against teaching modern geology from the pulpit. Hitchcock regularly sermonized on the apparent conflict of geology with the Bible, and wrote articles about it in the Christian press, carefully defending science while vindicating Genesis because its sequence of events was the same that geology had now proved, albeit over whole eons of time. Two years earlier (1.30.31), Hitchcock had written his Yale mentor about the Mosaic dispute, asking him for helpful readings. “I feel the need of taking safe ground on this subject: since at the best I suppose you & I are considered rather heretical & it’s a wonder if I do not get myself into a controversy but it’s time that the subject should be agitated among us I think.” “Safe ground” meant scientific support of Genesis that Christians needed to take into account. It was with relief that he wrote Silliman just after receiving the new edition of Bakewell (12.30.33): “I am glad you have so boldly thrown the gauntlet as to the Mosaic history. I shall now hope to get somewhat shelter behind your arguments & authority when attacked for certain heresies which I have disclosed in my Report.”

Hitchcock, 1831-1833

¹¹² He found confirmation for these views in the recent work of the elder Brongniart. See Silliman to Hitchcock, 6.14.32.

¹¹³ Bakewell 1833, p. 292.

¹¹⁴ Silliman’s appendix to Bakewell 1833, p. 465.

In his Final report issued in late 1833, about the same time as Silliman's Bakewell had appeared, Hitchcock found plenty of shelter among European writers, many lent him by Silliman. He foretold that he would be attacked by traditional Christians for the "heresies" in his report because there he wrote that the latest geological theories were not opposed to Genesis but, on the contrary, supported it. He repeated Silliman's reasoning, and extended it by drawing upon European writers and a greater range of evidence that the gap between the initial creation and the first day of Genesis allowed for the changes in the earth's crust and for its prehistoric creatures. Divine benevolence during this "semi-chaotic condition of the globe" provided humans with coal derived from vegetal matter, limestone from bones, and valuable metals from volcanic upheavals. There were several mass extinctions, each followed by deity's miraculous interventions that created new forms. This leap-frogging disproved the idea of a gradual metamorphosis over time. Biblical literalists would have counted among Hitchcock's heresies his belief that the current state of the world wasn't permanent. God interfered with the supposed operations of natural laws by recreating life, so that

the presumption is that he may interfere again, whenever the good of his universe demands. Thus do we get rid of a host of atheistical objections . . . It would have been well, if some, who can see nothing but atheistical tendencies in the principles of geology, had recollected before filling their pages with uncandid vituperation of this science and its cultivators, that it's the only science whose principles could furnish such a refutation.¹¹⁵

Hitchcock's purpose in writing his Final report wasn't the same as Bakewell's. The British scientist wrote a detailed account of world-wide geology that incorporated recent findings and theories, whereas Hitchcock's study was dedicated to the geology of Massachusetts. (It's true that the fourth portion of his report included zoology and botany, but this consisted largely of lists of native animals and plants, and had little claim to originality.) In his private journal he noted the many excursions he took all across Massachusetts and into adjacent states, from 1830 onward. These typically took four or five days at a time, traveling by horse about thirty-five miles a day.¹¹⁶ He made only superficial excavations, relying instead upon quarries, mines, and rocks exposed naturally or by road and canal cuts. For the future state collection, he occasionally bought mineral specimens for a dollar or less apiece.

Silliman's letters, beginning in January 1831, show how eager he was to publish portions of Hitchcock's future report and the colored map that was to accompany it. The letters expose protracted negotiations with the government and the printers so that Silliman could print the first portion, "Economic geology," in his journal, in mid-July 1832.¹¹⁷ The state had special interest in this first portion of Hitchcock's survey because there Hitchcock described and located rocks, minerals, and soils, together with their actual or potential uses. By the end of 1833, he had collected 1200 specimens of minerals and rocks, the nucleus of the state's collection which numbered over 2800 by the time he published his final report in 1841.

In the longest portion of the 1833 report, "Scientific geology," the Amherst professor took advantage of the most recent publications by leading European geologists. He wrote that they were in advance of Americans, and that he would inquire into how Massachusetts' rocks corresponded with theirs. He also believed that these analogies could "prove an identity of causes that produced them"¹¹⁸ and so place American rocks into worldwide formations. As he went about the state he constantly compared rocks and their strata with British and Continental

¹¹⁵ Hitchcock 1833, p. 248.

¹¹⁶ EOH, box 11, folder 10, miscellaneous notebook pages on travel for the reports of 1833, 1835, and 1841. On one of these trips of seven days (177 miles) in 1833, he spent a total of \$9.79 for toll gates, lodging, stabling his horse, and oats ("horse dinner"); on a typical day he had "supper, breakfast, lodging" for 65 cents.

¹¹⁷ AJS 22, 1 (July 1832): 1-70. "Report on the Geology of Massachusetts; examined under the direction of the Government . . . during the years 1830 and 1831; by Edward Hitchcock, Prof. of Chemistry and Natural History in Amherst College. Part I. The Economical Geology of the State, with a Geological Map." The hand-colored folded map, opened out, is 30 inches wide. An attached footnote reads: "Published in this Journal by consent of the government of Massachusetts, and intended to appear also in a separate form, and to be distributed among the members of the Legislature of the same State, about the time of its appearance in this work. It's, we believe, the first example in this country, of the geological survey of an entire state." In fact, in 1824 and 1825 Denison Olmsted had published in pamphlet form a survey of North Carolina's geology, but it wasn't financed by the state. See Anon. [Hitchcock], "Notice of the report on the geology of North Carolina, conducted under the direction of the Board of Agriculture; by Denison Olmstead [Olmsted], Professor of Chemistry and Mineralogy in the University of North Carolina," AJS 14, 2 (1828): 230-51.

¹¹⁸ Hitchcock 1841, *Final report*, p. 111.

findings, deducing their types, stratifications, and ages. He was ahead of Silliman because by analogy with British stratigraphy, he correctly deduced that the Connecticut River valley had strata of the “new red” sandstone not the “old red” that the Yale professor insisted upon.¹¹⁹ He paid attention to the routes that scattered boulders followed, generally moving from the north towards the southeast. He felt unable to explain the causes of this ancient “diluvial” flow, which he traced across grooves and scratches on rocks in the highest elevations. Unknowingly, he hovered on the edge of the explanation by Louis Agassiz that a gigantic ice cap once lay over the entire northern hemisphere.¹²⁰ He likened New England’s rocky furrows and erratic boulders to the evidence in Great Britain of a similar southeast drift of rocks from a “center of disturbance” to the north.¹²¹ De la Beche favorably referred to Hitchcock’s reasoning, so his report had some currency across the Atlantic. Mantell and Bakewell also complimented the report.¹²²

More than any other native geologist, Hitchcock took a leading role in lifting American geology out of its partial isolation, in contrast to the chauvinistic stance of Amos Eaton.¹²³ After each section describing the major types of rocks, he added “Theoretical considerations” that pointed to the latest, mainly European theories. He had abandoned Werner completely, unlike Silliman who still clung to some Neptunian ideas in 1833. Hitchcock reported that Brongniart and Beudant, formerly Wernerians, now agreed with Elie de Beaumont who had demolished Werner’s theories.¹²⁴ Hitchcock summarized Charles Lyell’s powerful new theory that the changes in the earth’s crust resulted from causes still in action and gradually deployed, that didn’t depend solely upon dramatic catastrophes like volcanoes or deluges. Although he credited Lyell with explaining a great deal, he nonetheless agreed with those who supposed that those “uniformitarian” causes “have acted with far greater intensity formerly than at present.”¹²⁵ In writing this, he took up the majority view, for only a very few geologists wholly accepted Lyell in the 1830s. One of Hitchcock’s most original conclusions was that the Allegheny mountains, part of an extensive eastern “system of elevation,” were far older than the western mountains, although this correct view was opposed by Elie de Beaumont.¹²⁶

For the modern reader of Hitchcock’s report, its most fascinating portion, “Topographical geology,” offers no new geological facts or theories. Nonetheless, it’s Hitchcock at his most original. He was the only major American geologist who treated landscape scenery as a vital feature of the science.

The most striking objects in the scenery of a country, where they exist, are high and precipitous mountains; especially if extensive plains, traversed by rivers, stretch away from their bases. I shall therefore, in the first place, describe, those conspicuous peaks and ridges in the State, whose summits afford wide and interesting prospects. . . . But mountain scenery is not particularly interesting, if the slopes are gentle, and the outlines of the hills are much rounded. It needs the sharp towering peak, the craggy and overhanging cliff, and the roaring torrent beneath, to arrest the attention, and excite strong emotions.¹²⁷

As these words indicate, he was a votary of romantic naturalism. A thoroughgoing Wordsworthian, he deeply loved the valleys and hills of his native region which he described in terms of the romantic picturesque and sublime. In public ceremonies, he renamed many of the high hills and salient features of his native region as contributions to his “nation’s poetry.”¹²⁸ Despite the fact that western Massachusetts had a well settled landscape, he urged his fellow citizen to “turn aside from the beaten track, urge his way through the tangled thicket, and climb the craggy cliff. There is a peculiar pleasure, which such a man only can experience, in feeling that he has reached a point perhaps never trodden by human foot, and is the first of the rational creation that ever feasted on

¹¹⁹ See my note for Silliman to Hitchcock, 7.18.33.

¹²⁰ Agassiz 1840.

¹²¹ For these parallels in Great Britain, he drew upon current publications by Phillips, De la Beche, and Roderick Murchison: Hitchcock 1833, pp. 166-68 and passim.

¹²² Silliman drew attention to De la Beche’s reference to Hitchcock, and mentioned Mantell’s and Bakewell’s good opinions: AJS 27, 2 (1835): 383.

¹²³ For example, Eaton on the coal beds of Pennsylvania, in the AJS 23, 2 (1833): 399-400.

¹²⁴ Hitchcock 1833, p. 515.

¹²⁵ Hitchcock 1833, pp. 518ff, in a section devoted to Lyell’s theory.

¹²⁶ Hitchcock 1833, pp. 533-37.

¹²⁷ Hitchcock 1833, p. 74.

¹²⁸ See Herbert 2010 and Halttunen 2002, 166-77. Hitchcock supplanted “uncouth and vulgar names” like Rattle Snake Hill or Saddle Mountain, with names of more suitable historic interest, like Mount Norwottuck and Mount Nonotuck

the landscape before him.”¹²⁹ Although he preached the gospel of Romanticism’s “first discoverer,” he also was devoted to the state’s pastoral landscapes. Indeed, he got his talented wife Orra White Hitchcock to make drawings for several lithographs that formed an album to accompany his report.¹³⁰ For each of White Hitchcock’s eight lithographs of the Connecticut River Valley, he included in the report a paragraph of evocative picturesque description.

Hitchcock and Silliman 1833-1835

Beginning in 1833, Silliman paid increasing attention to the growing discoveries in paleontology. In the first issue of his journal that year, he commented extensively on Mantell’s paleontological collections and his writings.¹³¹ From Philadelphia colleagues, Mantell had received specimens of American fossils and minerals, and remarked on their identity with those of England. Silliman also exchanged specimens with the Sussex paleontologist, receiving bones of the spectacular iguanodon and the megalosaurus. In the same and subsequent issues, he referred to the recent work on fossils of Cuvier, Brongniart, Gérard-Paul Deshayes, Buckland, and the American Timothy A. Conrad. No longer doing original work in geology, Silliman’s major role was editing his journal in which he kept his readers current with European science. There he also published a major statement on the Mosaic controversy, repeating the ideas of his appendix to Bakewell that year.¹³² In 1834 he began reaching out to a broader audience than readers of his journal by lecturing on geology in Hartford. Over the next two years he gave several series of lectures on geology in Boston, Salem, Lowell, and Nantucket, often to more than 1000 attendees.¹³³ He enlivened them by manipulating his voltaic apparatus and blowpipe, and by pointing to huge drawings on the walls. Adding to his outside commitments, he served as paid consultant to the federal government, completing a report on the sugar industry in May, 1833 (Silliman 1833). He further cemented his credentials as industrial consultant with a glowing account of the Lehigh Coal and Navigation Company.

In 1835 Hitchcock matched Silliman’s contributions to the Mosaic controversy in a sequence of three articles in the *Biblical repository*, a leading Christian journal.¹³⁴ He repeated Silliman’s reasoning (and quoted him) but he called more often upon recent geological publications. In more than 100 pages he laid out the recent theories and findings of European and American geologists, showing how these ideas supported Genesis as long as it wasn’t interpreted in a literal fashion. At the end of the year (12.25.35) Silliman alerted him to a current article in the *Biblical repository* by Moses Stuart (1780-1854), who attacked Hitchcock personally because his new geology conflicted with Genesis. In April 1836, Hitchcock replied in the same magazine, saying that in his ignorance, Stuart perpetuated earlier ideas now discarded by geologists. They teach us “that the earth was in existence a long period before the creation of man and the existing races of animals, and that this opinion is not inconsistent with the Mosaic history.”¹³⁵ We could consider Hitchcock to be Janus-faced, for he chastised geologists for the secular tone of their writings which made them seem like atheists, and frequently told biblical literalists that they needed to respect the “religion of geology.” The interpretation of Genesis, he wrote, will require further thought as geology presents new evidence.¹³⁶

Meantime, his work in the sciences continued apace. In an article for Silliman’s journal he wrote about a memorable northeast meteor shower on November 13, 1833.¹³⁷ He proposed that by analogy with the aurora

¹²⁹ Hitchcock 1833, p. 79.

¹³⁰ For Hitchcock 1833, she made drawings for other lithographs and for dozens of woodcuts. For these and samples of White Hitchcock’s formidable production, see Herbert and D’Arienzo 2011.

¹³¹ Silliman, “Museum of Gideon Mantell, Esq. of Lewes, in Sussex, England,” *AJS* 23, 1 (Jan. 1833): 163-79.

¹³² Silliman, “Remarks on the connection between the Mosaic history of the creation and the discoveries of geology occasioned by the lectures of Baron Cuvier on the history of the natural sciences, and published in Prof. Jameson’s *Edinburgh New Philosophical Journal* in 1832,” *American journal of science* 25, 1 (July 1834): 26-41.

¹³³ In his letters to Hitchcock from January 9, 1835, onward, Silliman writes about these lectures, sometimes with engaging details. For a biographical account of the lectures, see Fulton and Thomson,

¹³⁴ Hitchcock 1835, “The connection.”

¹³⁵ Hitchcock, “Remarks on Professor Stuart’s examination of Gen. I. in reference to geology,” *Biblical repository* 7, 22 (April 1836): 448-87. See John H. Gilner, “Genesis and geology: the Stuart-Silliman-Hitchcock debate,” *Journal of religious thought* 23, 1 (1996-1967): 3-13.

¹³⁶ Silliman’s Yale colleague James L. Kingsley (1776-1854), professor of Latin, Greek, and Hebrew languages, defended Hitchcock from Stuart’s assault: “Remarks on a ‘Critical examination of some passages in Gen. I.; with remarks on difficulties that attend some of the present modes of geological reasoning. By M. Stuart, Prof. Sacred Lit. Theol. Sem. Andover,’” *AJS* 30, 1 (July 1836): 114-30.

¹³⁷ Hitchcock, “On the meteors of Nov. 13, 1833,” *AJS* 25, 2 (1834): 354-63. In an addendum to this article, Hitchcock pointed out that a supposed meteorite fallen on the ground fourteen years earlier was in fact a gelatinous fungus.

borealis, the direction of the shower followed the plane of the earth's magnetic meridian. His gaze was normally down to the earth, however, because he continued uninterruptedly his diligent studies of Massachusetts and New England formations of rock and soil. Following numerous short investigative trips in Massachusetts, he spent a few weeks in Portland, Maine, in May, 1835. He gave several lectures on geology there to a small audience, which increased as the series continued. It was apparently his first series of public lectures and the first time he charged a fee.¹³⁸ In Maine he found that the "diluvial" drift moved from the northeast to the southwest, linking it the Allegheny Mountains and thereby to an extensive eastern range à la Elie de Beaumont.¹³⁹ Lyell rejected the term "diluvial," he wrote, but he nonetheless believed that the directional grooves in the rocks could only be explained in terms of forceful floods.

Elsewhere in his article on Portland, Hitchcock reflected Lyell more positively, because in that region's land slips, peat bogs, and coastal erosion he found evidence of causes of geological changes still in existence. Before leaving for Portland, he had prepared an article that repeated the Lyellian portions of his recent Report (see above), adding further thoughts about prehistoric petrified forests off the coast of Massachusetts, like those already described in European locations.¹⁴⁰ He pointed to layers of traprock split apart by frost, gravity, and rain; successive freezings of lake water that shifted rocks; and seashore erosion, all of these confirming Lyell's point that such causes acting over time could explain the phenomena of changes in the earth's crust. Here and in his Report he was adopting the majority view of Lyell: causes now in operation explained much, but one needed also to posit a significantly higher activity of massive floods, earthquakes, and volcanic eruptions in earlier times. This combined Lyell's Uniformitarianism with features of the Catastrophism that Lyell disallowed.

Also in 1835, Hitchcock published the second edition of his report, authorized by the state, accompanied again by a separate album of his wife's lithographs, three of which she had redrawn. Hitchcock reprinted the first edition but added a few paragraphs here and there to take account of the new ground he had been exploring in Massachusetts and adjacent states. Recently discovered fossils of arborescent ferns in the Boston area was proof that New England had once had a tropical climate. Having recently read European studies of the implications of fossil vegetation,¹⁴¹ he was again eager to relate America to other areas of the globe. He now listed Lyell and Mantell as two of his principal authorities, adding their names to Brongniart and De la Beche whom he had cited in 1833. For the first time, as he described Massachusetts serpentine rock, he used Lyell's term "metamorphic."¹⁴² After the revised report was distributed, he separately republished its lists of the state's animals and plants, which had been done with the collaboration of eight colleagues; he added many new entries.¹⁴³ (For his Final Report in 1841, he would limit himself to geology.)

1836: Hitchcock's "Sandstone bird"

In January 1836, Hitchcock published in Silliman's journal an article that announced a remarkable discovery, prehistoric fossil foot tracks.¹⁴⁴ In many ways it was his most important piece of writing to date, eclipsing his reports on the state's geology because it drew the attention of the whole world of geology and paleontology. He wasn't the first to discover these tracks, for it was Dr. James Deane (1801-1858) who told him about them, but he was the first to publish a learned account of them. Eight years later Deane and he had a public dispute over who was the first "discoverer," so it's worthwhile to document their stories in the Hitchcock-Silliman correspondence and in other sources (see below, Hitchcock's controversy with James Deane, 1842-1845). The preparation of "Ornithichnology" shows the workaholic Amherst professor determined to put himself forward.

In early 1835, Dexter Marsh (1806-1853) of Greenfield spotted animal tracks in slabs of slaty sandstone taken from a quarry to be used for flagstones, and drew Deane's attention to them. Deane purchased two of the pieces and wrote Hitchcock about them on March 7th, noting their resemblance to turkey tracks. In his reply eight days later, Hitchcock told Deane to be wary of confusing random impressions on the stones with those of living beings. Deane responded on March 20th that he had seen more tracks, certainly made by "some bird probably of

¹³⁸ See Hitchcock to Silliman, 5.31.35.

¹³⁹ "Sketch of the geology of Portland and its vicinity," *Boston journal of natural history*, 1, 3 (1836): 306-47.

¹⁴⁰ Hitchcock, "On certain causes of geological change now in operation in Massachusetts," *Boston journal of natural history*, vol 1, 2 (May 1835): 69-81.

¹⁴¹ Including two works by Henry T. Witham (see Silliman to Hitchcock, 7.18.33), and Augustin de Candolle's *Organographie végétale* (Paris 1827). On these two authors, and on the global temperature, see Hitchcock 1835, *Report*, pp. 241 and 286.

¹⁴² Hitchcock 1835, *Report*, p. 369.

¹⁴³ Hitchcock, ed., *Catalogues of the animals and plants of Massachusetts, with a copious index* (Amherst 1835).

¹⁴⁴ Hitchcock 1836: 307-40.

the turkey species,¹⁴⁵ and in April sent Hitchcock illustrations and casts. At some point shortly afterwards Hitchcock, convinced, went to Montague and bought several of the sandstone impressions and examined others in nearby quarries. Then in July he got a letter from Silliman (7.22.35) who wrote that he had received from Deane a plaster cast of the tracks and a description that he would like to publish. He wanted Hitchcock's opinion because if they weren't genuine, he would then "be laughed at as Fs-h [Featherstonhaugh] was for his rhinoceros jaw." In his reply (7.30.35), Hitchcock said he had found stony tracks of at least five species of birds whose foot impressions most closely resembled the Grallae, wading birds. He would prepare a paper for Silliman's journal and would give Deane "the credit of having put me upon the track after these relics: but I hope if consistent you will delay his description until you receive mine as I am sure I shall be able to present a more full & satisfactory view of the case than he can do."

Before December, when he sent Silliman his draft, Hitchcock examined still more tracks in quarries and exposures north of Greenfield and southeast of Northampton on both sides of the Connecticut; some he found used as flagstones in Northampton and Deerfield. Silliman was obviously eager to publish an account of the tracks because no fossils of birds had ever been discovered as deep as new red sandstone, so it would be an epochal publication. He assured Hitchcock (8.6.35) that he would give him priority, expecting him "to do justice to Dr. Deane." That autumn he went out of his way to arrange engraved plates for the article; he debated lithography but changed to engraving on copper because it was cheaper.¹⁴⁶ A dedicated editor, he went carefully over Hitchcock's drafts, adding a few footnotes to the published text; he corrected the spelling of Ornithichnology (stony bird tracks) after consulting Yale's "learned Grecians." (12. 25.35).

On the first page of "Ornithichnology," Hitchcock wrote that "My attention was first called to the subject by Dr. James Deane of Greenfield . . . Through the liberality of the same gentleman, I soon after obtained the specimens themselves . . ." A paragraph later, he added: "Not long afterwards, Col. John Wilson of Deerfield, pointed out to me similar impressions on the flagging stones of that village." Years later, as we've seen, Deane felt aggrieved because Hitchcock hadn't written that he, Deane, from the first had said the tracks were made by birds, and that this initial identification was denied him. Doubtless Hitchcock, having found impressions of wading birds, not the turkeys that Deane analogized, and having laboriously examined and described them in scientific terms, felt that he was far ahead of the Greenfield doctor and paired him with Col. Wilson as having merely pointed to the tracks. Arrogance may be too harsh a characterization, but he believed Deane to be a less qualified interpreter and, in his rush to take credit for the phenomenon, he exposed the flinthearted ambition that underlay the heady pace of his work.

Hitchcock's long article is an example of careful reasoning, with extensive detailed descriptions of the bipedal tracks and their locations, leading to the conclusion that they were formed by birds wading in shallow water whose muddy or sandy soil was subsequently turned to slate. This stone corresponded to European new red sandstone (which since then has been placed in the Jurassic era). He described the impressions with precision, down to the length and thickness of toes, the presence or absence of claws, the length of the feet, and the distances between footmarks when they are aligned as if walking. These he compared with the tracks of several kinds of living birds, which he also illustrated. He expressed his deductions with undogmatic caution. It seemed to him, he wrote, "that the exigencies of the case require us to suppose them [the tracks] produced by birds, whose habits were those of the Grallae."¹⁴⁷ He keyed his textual descriptions to the illustrations so that others could see his evidence and make up their own minds. Because no birds had ever been found at that great depth, he felt justified in coining "Ornithichnology" (stony bird tracks) as a new branch of knowledge. He subdivided the "Ornithichnites" into two classes, thick- and thin-toed, and each of these into several species, giving each its own binomial. The footmark of "O. giganteus" is sixteen inches long (excluding claws), far larger than the biggest extant bird, the ostrich. Silliman was suitably astonished and decided to have Hitchcock's drawing of this specimen engraved in actual dimensions. This large fold-out print was accompanied by two other large plates. One bears 24 impressions of many of the fossil footmarks and those of living birds for comparison; the other shows them in proportional size.

In the weeks following publication of "Ornithichnology," Hitchcock sent offprints to several British and French geologists. His letters make it clear that he expected a negative reaction to his article and he wasn't

¹⁴⁵ From Hitchcock's copy of Dean's letter, in EOH, box OS1, folder 12.

¹⁴⁶ See Silliman to Hitchcock: 11.23.35, 12.4.35, 12.11.35 and 12.18.35.

¹⁴⁷ Hitchcock 1836, p. 336.

mistaken. In June 1836 an anonymous attack on it was published.¹⁴⁸ (Silliman identified the author as one of his contributors, A. B. Chapin.)¹⁴⁹ Chapin wrote that Hitchcock's bird tracks were mistaken readings of impressions rising from his "prolific fancy." Hitchcock was quickly consoled, however, for that summer Silliman wrote him (8.19.36) that William Buckland had "communicated to the Ashmolean Society at Oxford a notice of your discoveries."¹⁵⁰ In his "Bridgewater treatise," published at the end of the year, Buckland gave prominence to Hitchcock's discovery. He copied two of the plates from "Ornithichnology," giving them lengthy descriptions and concluding that "these footsteps . . . are of the highest interest to the Palaeontologist, as they establish the new fact of the existence of Birds at the early epoch of the New Red sandstone formation; and further shew that some of the most ancient forms of this class attained a size, far exceeding that of the largest among the feathered inhabitants of the present world, and were adapted for wading and running, rather than for flight."¹⁵¹ Daubeny was so impressed by the footmarks that he gave them prominence in his study of North American geology published in 1839, an accolade welcome to Hitchcock because Daubeny also drew significantly upon his analysis of New England geology from his 1833 report.¹⁵² He had visited Hitchcock in Amherst in November, 1837, when he accompanied him up Mount Holyoke and along the nearby shores of the Connecticut River. He saw fossil footmarks in situ and in Amherst's collections, and described them himself in detail. "I went away, fully impressed with the belief, that they could have been produced in no other way than by the treading of birds of various sizes upon a soft and plastic material."¹⁵³

In the spring or summer of 1836, Hitchcock sent sent casts of the tracks to the London Geological Society, where they attracted a lot of attention. Brongniart saw them there and was much impressed; he volunteered to pay for copies for Paris's Musée d'histoire naturelle.¹⁵⁴ Most leading British geologists were also struck by the footmarks. Mantell agreed with Buckland and Daubeny by reporting favorably on them, but with his habitual caution said that until bones were found, the interpretations had to remain problematic.¹⁵⁵ In 1839, when Richard Owen published news of the "Dinornis," the giant extinct bird of New Zealand (the Moa), Hitchcock's ascription of the marks to birds was given a boost. Even in 1843, when bipedal dinosaurs were known ("Dinosaur" was coined by Owen in 1842), Mantell, Owen, and Murchison still agreed with Hitchcock's birds. Murchison hoped for the discovery of the bones "of some fossil Dinornis," but that "in the meantime, let us honor the great moral courage of Professor Hitchcock in throwing down his opinions before an incredulous public."¹⁵⁶

Despite teaching duties and the preparation of an article defending himself against accusations of impiety (see below), he found time to compose an epic poem on the fossil footmarks while the ink was barely dry on his article. On March 1, 1836, he mailed "The Sandstone Bird" to Silliman. It has 125 verses, followed by fourteen footnotes (it's given in its entirety with the letter). A solitary geologist is examining the footmarks of Ornithichnite giganteus. He conjures up a sorceress who, in rhyming verse (the poem otherwise is in free verse) contrasts her powers with science.

“Bird of mighty foot (Oh vain!
Ornithichnites call'd by name:
Science thus her ignorance shows,
On a footmark to impose
Name uncouth; while by my arts
Into life the biped starts:)
Bird of sandstone era, wake;
From thy deep dark prison break.”

¹⁴⁸ Anonymous [A. B. Chapin], "Ornithichnology," *Knickerbocker* 7 (June 1836): 578-82. Hitchcock's response appeared in vol. 8 (Sept. 1836): 289-95, and Chapin's rejoinder in vol. 8 (Oct. 1836): 456-58. On Chapin, see Hitchcock to Silliman 8.16.36, and Silliman to Hitchcock 7.25.36 and 8.19.36.

¹⁴⁹ Silliman to Hitchcock, 7.6.36. See my note for this letter for more on the *Knickerbocker* articles, including Hitchcock's rebuttal.

¹⁵⁰ Silliman to Hitchcock, 8.19.35.

¹⁵¹ Buckland 1836, vol. 2, pp. 39-40.

¹⁵² Daubeny 1839.

¹⁵³ Daubeny 1839, p. 20. He writes a fascinating interpretation of New England's democratic culture, pp. 18-19.

¹⁵⁴ Brongniart to Silliman, 1.6.37, quoted in Silliman to Hitchcock, 4.15.37. It wasn't until 1839 that Hitchcock sent casts to Paris (Hitchcock to Silliman, 7.20.39).

¹⁵⁵ Mantell 1839, vol. 2, pp. 478-80.

¹⁵⁶ Murchison, addressing the London Geological Society Feb. 17, 1843, cited by Silliman, "Ornithichnites of the Connecticut River sandstones and the Dinornis of New Zealand," *AJS* 45, 1 (Oct. 1843): 188.

...

The witty reference to Hitchcock's "name uncouth" stands out from the rest of the poem whose verses invoke a monstrous bird with words and phrases from the dramatic realm of the romantic sublime. The animal's enormous size and its huge fellow creatures contrast with the "puny races" the monster now sees. Disappointed at the present world's degenerate condition, whose beings "hate each other," the gigantic form returns to the void, leaving the humbled geologist to lament that he couldn't explain "the history of sandstone days." Ever the pedagogue, Hitchcock attached fourteen learned footnotes to his poem, explaining its paleontological words and also commenting on the warm, ancient climate that prevailed between the initial creation and the advent of man. In the last footnote, one hears the voice of the Calvinist who was thinking of the lugubrious passage of time and "approaching ruin."

Hitchcock's poem reflects his disappointment that he couldn't identify with any certainty the bird whose tracks he had been studying, yet he was so excited at finding what he believed to be traces of the earliest birds, that he was able to imagine himself transported back to the Jurassic shallows. In his scholarly "Ornithichnology" he encouraged the reader to reach out and feel the engraved rocks on which the animals had walked by adducing their original muddy state, as though present when the steps were formed.

Sometimes these ternate depressions run into one another, as the toes approach the point of convergence: but they also sometimes stop short of that point, as if the animal had not sunk deep enough to allow the heel to make an impression. Nay, at that point the stone is in some cases irregularly raised, as if the weight of the animal had caused the sand or mud to crowd upwards in the rear of the step. In a few instances, also, behind this slight elevation, there is a depression as if a knobbed heel had sunk slightly into the yielding mass.¹⁵⁷

This is writing that is deeply resonant of the romantic naturalist, so it's no wonder that Hitchcock wanted to publish a poem that would allow his voice to be heard. He let Silliman decide whether or not he would print the poem. Silliman declined (7.6.36), so Hitchcock that autumn sent his poem to the *Knickerbocker* in New York. Over the summer and fall, that journal had published his duel with Chapin about the footmarks, so both author and editor found it circumspect to print the poem in December as the work of a "poetaster," Hitchcock because it constituted a defiance of Chapin, and the editor because it continued the subject's notoriety.¹⁵⁸ The pseudonymous author wrote that upon reading Hitchcock's January article "it occurred to me that there was at least probability enough in the theory advanced in that work, to make it lawful to use in verse . . ."¹⁵⁹ Besides his family and Silliman, would anyone else have been aware that Hitchcock was writing about himself in the third person?

The Mosaic controversy, 1837-1839

Hitchcock paid no attention to religion in "Ornithichnology." He mentioned scripture only on passing, as he had in his 1833 Report. From early days, as we've seen, he had regularly separated his writings on science from those on religion. Both formed a whole in his mind and in his teaching, but their separation in the public realm was an unwitting confession of conflict between the two. At the beginning of his three articles for the Biblical repository in 1835 (see above) he lamented the fact that "The principles of geology have long been regarded not only as hostile to revealed truth, but as favourable to atheism." Geologists, intentionally or unintentionally "give a quite atheistical aspect to some of their most famous theories." Neglect of religion leads to conclusion that "geology must be the favorite resort of irreligion." It's not enough to deny irreligion: geologists "must show positively" the "perfections and plans" of God."¹⁶⁰ Hitchcock feared that if fellow theologians read his scientific work, they might conclude that he was "hostile to revealed truth" because he hadn't there made clear

¹⁵⁷ Hitchcock 1836, pp. 309-10.

¹⁵⁸ Anonymous (Hitchcock), untitled poem, *Knickerbocker* 8 (Dec. 1836): 750-52.

¹⁵⁹ Compared with the original manuscript of the poem, the *Knickerbocker* publication was a bit less scholarly. It omitted the first six lines and the verses about the "name uncouth" quoted above, and reduced the footnotes to four (numbers 5, 9 10, and 14). The original manuscript hasn't been known, so it's the truncated version in the *Knickerbocker* that has been the source of the occasional republications, including Jordan Marché, "Edward Hitchcock's poem, The Sandstone bird (1836)," *Earth sciences history* 10 (1991): 5-8.

¹⁶⁰ Hitchcock 1835, "The connection," Jan. 1835, 113.

his beliefs. He had to defend himself to scriptural believers by showing how he brought science and religion together.

In 1837, Hitchcock duplicated his tripartite article of 1835 by another sequence of three essays on the Mosaic controversy in the same journal.¹⁶¹ He again deployed his “religion of geology” with an even longer account (134 pages) of recent geological writings (Lyell, Macculloch, Murchison, Sedgwick . . .) and why they could endorse scripture—but scripture so interpreted as to deny a literal reading of Genesis. He dwelt at length upon his own conviction that the north-to-south movement of boulders and surface grooves in America were the effects of a deluge, and argued against Lyell’s view that there were never universal deluges, only limited ones such as bursting lakes or flooding rivers and the consequences of earthquakes. Hitchcock therefore opposed his “diluvialism” to Lyell’s “fluvialism.”¹⁶² He drew upon recent writings by Sedgwick, Murchison, De la Beche, Daubeny, and others who used the word “diluvial.” Despite their severally different conceptions of the term, he could enlist them to counter fluvialism. He even disputed Buckland, whom he otherwise praised to the skies for his deeply religious conceptions, because in his “Bridgewater treatise” the British authority wrote that geology shows “a recent inundation of the earth” but that this wasn’t the Noachian deluge. Hitchcock fairly listed the objections to identifying the two floods, but thought that on balance the forty days of biblical rain could have flooded the earth. Hedging himself, however, he writes that the Mosaic flood wouldn’t have been one of the catastrophic deluges that geology placed in more ancient times.

If Hitchcock seems reasonable most of the time in these articles, at one point he attacked Lyell with such excess that it makes the modern reader cringe. In 1835 he had written that Lyell was guilty because he limited himself merely to admitting “proofs of a Creative Intelligence,” and because the Noachian deluge must be considered a supernatural event “far beyond the reach of philosophical inquiry.” In the first of his 1837 articles, Hitchcock raised the level of his attack. “We know nothing of Mr. Lyell’s religious creed. But there is something in such an ambiguous mode of treating scriptural subjects that reminds us of infidel cunning and duplicity.” Lyell opposed geology and scripture. “We are by no means disposed to charge infidelity upon Mr. Lyell; we have, indeed, on a former occasion, attempted to defend him from the charge of irreligious opinions. But we feel bound to say that we decidedly object to such a mode of alluding to the Scriptures; and Mr. Lyell can hardly expect that it will not excite an apprehension, in those ignorant of his religious belief, that he is skeptical, and that he has been thereby influenced in forming his opinions respecting the deluge and the age of the world.”¹⁶³ Hitchcock also attacked Macculloch and Boué, in their cases for having specifically denied any relation of Genesis to geology.

Silliman objected strongly to Hitchcock’s censure of Lyell. “I was very sorry to observe you impute ‘cunning & duplicity’ to Lyell . . . You have now sounded the note of infidelity for Lyell & so it will go on your word through all the theological world in America, while I really think you had not good cause for the accusation & it looks a little like courting favor with those who will only turn upon us the harder, since the finest geological writer of the age is confessed by an eminent geologist to be an infidel.”¹⁶⁴ For his long reply (3.12.37), Hitchcock donned his ministerial garb to defend his attack on those whose geological writings could be seen as irreligious. When Lyell mentioned the Bible, he should have openly declared his faith lest one think him an infidel. Hitchcock didn’t want his scientific writings to risk the same opprobrium (as it had in the objections of Moses Stuart).

On the contrary, if the religious community see that we are as eagle eyed as themselves to discover hostility to revealed truth & by no means disposed to defend any statements because made by a distinguished geologist, I think it will tend to diminish the odium under which we labour . . . While I mean to convince them [fellow religionists] that I am a decided friend of revelation & opposed to infidelity in every form, I mean also to show them that I am not afraid with equal boldness to vindicate geology. I believe such a course will secure their favour but if not I shall try to do without it.¹⁶⁵

Silliman regretted Hitchcock’s denunciation of Lyell, but he was on the same side of the Mosaic controversy. In a brief notice later in 1837 of the American edition of Buckland’s “Bridgewater treatise,” he praised the author in the same way that Hitchcock did. “The consistency of all these things with the Genesis is

¹⁶¹ Hitchcock 1837, “The historical.”

¹⁶² In Hitchcock’s terminology, diluvialists (Cuvier and Buckland among them) believed that a series of worldwide deluges caused successive extinctions of species and the breaks between geological formations, whereas a fluvialist thought that geological strata resulted from an orderly deposition of sediments over long periods by processes currently observable.

¹⁶³ Hitchcock 1837, “The historical,” Jan. 1837, pp. 129-30.

¹⁶⁴ Silliman to Hitchcock, 3.6.37.

¹⁶⁵ A month later (4.11.37), Hitchcock grudgingly agreed with Silliman that he had gone too far in condemning Lyell.

ably illustrated by Dr. Buckland, in a preliminary discourse, and we are fully convinced that nothing is necessary to a universal and just conviction on that subject, but a full knowledge of the facts, without which it is impossible to judge in the case. . . . This work is very appropriate to the library of clergymen . . .”¹⁶⁶ Silliman went further in 1839 when he addressed the scientific community directly on the need to reconcile geology and Genesis. Hitchcock—to repeat—kept his scientific writings largely free of this controversy, but Silliman added substantial accounts of it in his American editions of Bakewell and Mantell.¹⁶⁷

Bakewell’s text, published in London in early 1838, takes into account Murchison’s recent naming of “Silurian” strata, and his and Sedgwick’s work in Devonshire, without conceding the broader conceptions of “Silurian” and “Devonian.” His earlier Wernerian concepts have disappeared—Cordier’s findings of internal heat are firmly endorsed—and he reports on recent paleontological findings by Buckland, Mantell, and others. It’s necessary to invoke the Creator occasionally because “secondary causes” can’t explain all known phenomena. He quoted approvingly from Sedgwick’s reconciliation of science and religion, and added that he also believes “too firmly in the immutable attributes of that Being, in whom all truth, of whatever kind, finds its proper resting place, to think that the principles of physical and moral truth can ever be in lasting collision.”¹⁶⁸

Silliman, thinking of his American audience as more conservative in religious matters than the British, didn’t let Bakewell’s Christian assurances stand alone. The title of his substantial appendix (110 pages) shows his intentions: “Suggestions relative to the philosophy of geology, as deduced from the facts and to the consistency of both the facts and theory of this science with sacred history.”¹⁶⁹ He returned several times to the accommodation of science and Genesis that he had explained in his appendix to Bakewell in 1833, and duplicated its “table of coincidences between the order of events in Genesis and geological discoveries.” He now added supporting evidence deduced from recent paleontological discoveries of ancient fossils. Again, as in 1833, he warned that one shouldn’t try to explain modern geology from the pulpit. This could have given Hitchcock the excuse to separate the two, but of course the Amherst professor’s sermonizing in print concentrated on showing how and why geology was no enemy of religion.

Silliman’s 1839 appendix is one of his most fascinating writings. He gives a resumé of modern American geology, with homely references to New England, including a recapitulation of the White Mountain flood that killed the Willey family in 1826. From a similar parochial vantage point, he writes that geological structure influences society. New England’s “bleak hills and long winters” discourage agriculture, but its rivers and indented seacoast encourage “an impulse towards the ocean” and maritime prowess, while abundant water power encourages mechanical ingenuity. More cautious than Hitchcock, he mentions erratic boulders and “rocks of transport,” but doesn’t refer to his friend’s evidence of a north-to-south movement of “diluvium.” Instead he says that “We are precluded, by our limits, from discussing the causes of their transportation, whether by floods, ice floes, or other motive power.”¹⁷⁰

He looks back on his appendices to Bakewell in 1829 and 1833, acknowledging the need to align himself more fully with the new geology. He admits that the strong influence of Werner was still evident in 1833, and that he hadn’t granted igneous action sufficient place: “perhaps my own admissions of its agency were not commensurate with the proofs that existed in 1833.”¹⁷¹ In 1839 his conception of igneous action still retained a Wernerian tinge because he grants water a primordial role. He still believes that galvanic action was a cause of internal heat which reacted with water to produce volcanoes and earthquakes. He included himself among those “who have been among the last to retreat from” Werner, but he urged retention of Wernerian terms (discarding their relation to a theory of origins) because the new terms introduced by Lyell, Conybeare, Brongniart and others were inconvenient and might imply “theoretical views.”

Silliman’s introduction to Mantell’s *Wonders of geology* appeared a few months after his Bakewell edition. It repeats much of what he wrote in that appendix, including the sections devoted to “Influence of geological structure on society” and “Consistency of geology with the scriptures.” Mantell’s own text has a three-page section on “Harmony between Revelation and geology.” He was more conversant with very recent geology than Bakewell, and deployed the new classifications Cambrian, Silurian, and Devonian that Silliman was keeping

¹⁶⁶ Silliman, bibliographical notice, *AJS* 37, 2 (1837): 397-98.

¹⁶⁷ Bakewell 1839, and Mantell 1839. Silliman had corresponded with both men over previous years; Bakewell’s son Robert emigrated to New Haven and made drawings for Silliman.

¹⁶⁸ Bakewell 1839, p. 437.

¹⁶⁹ For an excellent analysis of Silliman’s views of the mosaic controversy, see John C. Greene, “Protestantism, science and American enterprise: Benjamin Silliman’s moral universe,” in *Benjamin Silliman and his circle: studies on the influence of Benjamin Silliman on science in America*, ed. by Leonard G. Wilson (New York 1979).

¹⁷⁰ Bakewell 1839, p. 487. For the influence on society of geological structures, see pp. 483ff.

¹⁷¹ Bakewell 1839, p. 462.

at distance. Silliman had corresponded and exchanged specimens with Mantell for years, so he regretted his need to announce that for lack of funds, the British savant had been obliged to turn over his great paleontological collection to the British Museum instead of founding his own museum.

Hitchcock's geology, 1836-1839

In the spring of 1836, when he mailed "The Sandstone Bird" to Silliman, Hitchcock received an offer from the governor of New York to direct a geological survey of the eastern region of the state.¹⁷² He wrote Silliman for advice, worried that the pay would be poor, and that politics might have entered the selection of geologists for his and three other regions of the state. Silliman thought he should decline because the stipend wouldn't be honorable, but Hitchcock chose to accept for a reason only a compulsive worker would give: "The hope of recruiting my exhausted energies is the principal object that influenced me to accept." He equipped his horse-drawn wagon "à la mode géologique," and set out for the Hudson with an assistant. However, after a few weeks of work, he withdrew from the survey on grounds of ill health (and despondency). "The present season has been a very barren one for me as to intellectual effort." (8.16.36).

After his return from eastern New York, Hitchcock continued to seek out fossil footmarks along the Connecticut. He also pursued his ideas about the effects of diluvial action. On nearby Mount Holyoke, he discovered nearly 100 "diluvial vallies" that he attributed to the "mighty rush of waters from the north of which there are so many traces in our country."¹⁷³ These narrow ravines (which we now know to be the result of glacial action) were confirmation that this great southward flow would be found throughout the country. This would favor the "diluvialists" over the "fluvialists," that is, those who believed in catastrophic floods over those, like Lyell, who thought the action of rivers and floods over vast time sufficed to create such effects. "The Lyell dynasty may rule for a time: but truth will outlive Lyell & Boué & Macculloch for it is deeply engraved upon our everlasting mountains." In other words, Hitchcock couldn't give up the idea of floods of biblical proportions.

A year after "Ornithichnology" appeared in Silliman's journal, the editor published a short account of Hitchcock's continued researches into the footmarks.¹⁷⁴ An Amherst student had told Hitchcock about stone steps in Wethersfield, Connecticut, that bore tracks resembling those described in his article, and more tracks at a quarry in nearby Rocky Hill. He gave their dimensions and keyed them to the species of Ornithichnites listed by Hitchcock. In the same issue of his journal, Silliman published an anonymous note (by Dr. Joseph Barratt) about bird tracks at Middletown, Connecticut. "I have discovered the tracks of birds similar to those described by Prof. Hitchcock: I have some well marked slabs, with tracks."¹⁷⁵ This finding followed upon the discovery in Hildburghausen, Germany, of animal impressions on a stratum of sandstone corresponding to Hitchcock's,¹⁷⁶ so he must have been greatly encouraged that his work was being extended.

He was able to add to his count by the summer of 1837, when he published with Silliman a paper listing more tracks he found up and down the Connecticut, and on flagstones in Manhattan and Brooklyn.¹⁷⁷ He revised his nomenclature to take account of double the number of species listed in "Ornithichnology." These included "Sauroidichnites," lizard-like creatures; some of them he thought were marsupial-like quadrupeds. While the draft was in his hands, Silliman wrote (3.6.37) "Would it not be well to abstain from coining learned names for things that are still so uncertain as the sauroid birds, or birds with sauroid feet?" Hitchcock stubbornly retained his terminology, unwilling to draw back from the differentiation of the tracks required by their greater number and types.

¹⁷² For Hitchcock's negotiations with Governor William Marcy, see letters he wrote the governor in April and May, 1836 (Simon Gratz Collection, Historical Society of Pennsylvania, and copies in EOH Box 5, folder 1). He named as assistant on the survey Charles B. Adams (1814-1853), young Andover chemist and geologist, and itemized in great detail the expenses he anticipated that would total \$1500 for five months. See also the letters from Hitchcock to Silliman of 6.4.36, 6.20.36, and 8.16.36, and from Silliman, 6.7.36 and 7.6.36.

¹⁷³ Hitchcock to Silliman, 8.16.36.

¹⁷⁴ "Ornithichnites in Connecticut.—Extract of a letter from Prof. E. Hitchcock, dated June 28th, 1836," AJS 31, 1 (Jan. 1837): 174-75.

¹⁷⁵ "Bird tracks at Middletown, Conn., in the new red sandstone, Extract of a letter to the editor dated Aug. 18, 1836," AJS 31, 1 (Jan. 1837): 165. In a letter to Hitchcock (8.19.36), Silliman identified the author as D. J. Barratt

¹⁷⁶ Silliman wrote that it was Mantell who told him of this discovery in a letter of Aug. 24, 1835: AJS 30, 1 (July 1836): 191-92.

¹⁷⁷ Hitchcock 1837, "Fossil footsteps," pp. 173-75. He had drafted a lengthy article but shortened it to await further researches; these appeared in Hitchcock 1841, *Final report*.

Continuing research and classification of the fossil footmarks wasn't Hitchcock's only preoccupation in 1837. He had a translation made of the text by Fourier that he considered the fundamental argument for the earth's internal heat and a convincing account (surprisingly modern!) of the effects on surface and atmosphere of solar radiation and of the "common temperature of the planetary spaces."¹⁷⁸ More important for his recent thinking was the treatise by De la Beche (borrowed, as usual, from Silliman) that he edited and made a textbook for his students. It had "the most satisfactory theoretic views of geological phenomena to be found in any work extant."¹⁷⁹ He had corresponded with De la Beche and sent him his 1833 Report soon after its publication. In his book the geologist made flattering references to Hitchcock's interpretations of the northern origins of erratic blocks and detritus in New England. Agreeably to Hitchcock, De la Beche also opposed Lyell's central idea that causes now observable had produced all the earth's geological changes.

Hitchcock's preface and notes, some several pages long, converted De la Beche's book to a manifesto of his current thinking. "The notes which I have added, are in very few cases intended to controvert the opinions of the author. But for the most part, they contain facts respecting American Geology, that may modify the conclusions drawn from European rocks; or they consist of new facts which I have recently observed, and which I have thought might prove of interest to geologists."¹⁸⁰ Hitchcock summarized his work on New England geology, and drew attention to the fossil footmarks that entered importantly into current researches in paleontology. These include the sauroid tracks, and he stressed the importance of having found fossils of living creatures in the New Red sandstone. In his continuing effort to correlate American and European geological strata, he pointed out that the fossil fish along the Connecticut river are found also in Germany.

De la Beche, he found, was guilty of several errors. Fourier's "masterful" exposition shows with mathematical assurance that intense central heat doesn't reach the surface of globe but is unwaveringly manifested at "a moderate depth." This, he felt, conflicted with De la Beche's idea that the earth's climate is headed toward gradual refrigeration supposedly resulting from "a gradually diminished surface temperature arising from interior causes."¹⁸¹ He thought De la Beche mistaken to believe internal heat alone can explain crystalline formation of rocks. His own examination of New England rocks (he cites types and locations) convinced him of the dual action of igneous and aqueous forces. For him, the worst mistake of the British writer is that he failed to address the links between geology and religion. For that reason, Hitchcock added an appendix of extracts from the views of other geologists like Buckland who favored those connections. In a particularly Hitchcockian fashion, he ended his preface with extensive quotations from a recent book by Claude-Antoine Rozet, whom he commended for placing geology at the service of the Deity.¹⁸² He quotes Rozet to echo his own romantic sublime. The geologist's dwelling place "is not in cities—the centre of luxury and effeminacy—but on the mountains; in the fissures of those gigantic masses, whose tops shoot up above the clouds . . ."

Hitchcock was often out among the hills and valleys of Massachusetts in 1837 because he continued to survey the state's minerals, soils, and rocks. In early December, 1836, he sent to the state senate an appeal for authorization to carry out researches not yet completed when the second edition of his report was published.¹⁸³ He would make more analyses of soils, collect rocks and minerals for the state's collections, incorporate evidence of fossil footmarks of birds, and provide a larger colored geological map of the state. Other states, he wrote, had recently made maps "superior" to his of 1833. He was his own best lobbyist and not shy about political cultivation of both legislature and governor. He gave Governor Edward Everett specimens of minerals for his private collection, although Everett offered reimbursement. The legislature authorized his new survey on April 12, 1837, with an eye on the economic value of the state's resources.¹⁸⁴ He began steady work on the project in the fall, and his supplemental survey was duly published by the state printers in April 1838: Report on a re-examination of the economical geology of Massachusetts.

At the beginning of his interim report (139 pages), Hitchcock summarized his charge from the state. He would provide a detailed account of soils, marls, limestone, clay, vegetable nutrients, coal, metallic ores, etc.,

¹⁷⁸ Fourier 1837. Hitchcock's introductory note said he got Ebenezer Burgess, tutor at Amherst College, to translate it from the *Annales de chimie et de physique*, vol. 27 (Paris, 1824).

¹⁷⁹ Hitchcock 1837, De la Beche. Hitchcock's preface is signed March 1, 1837; he does not mention a translator.

¹⁸⁰ Hitchcock 1837, De la Beche, preface, pp. iv-v.

¹⁸¹ Hitchcock 1837, De la Beche, footnote, p. 325. He announced his translation of Fourier for a forthcoming issue of the *AJS*.

¹⁸² Claude-Antoine Rozet, *Traité élémentaire de géologie* (Paris 1835).

¹⁸³ Hitchcock, "Letter on the geological survey of Massachusetts," Boston, *Senate document no. 9* (Jan. 1837). The letter is signed Dec. 3, 1836.

¹⁸⁴ For the state commission and the continual negotiations over its costs and scope, and for the gift of minerals, see letters Hitchcock received from Governor Edward Everett from 5.6.37 to 3.16.38, in EOH Box 3, folder 12. For the new survey Hitchcock received a per diem of \$6 for himself and \$2 for an assistant.

with attention to their uses in agriculture and commerce, telling where and how they were collected and analyzed. Soils would be analyzed “with a view to their improvement on chemical principles.” He also proposed to report on fossil footmarks, to redefine the exact locations of rock formations and to gather new specimens of rocks and minerals for the state collections, but he had to abandon those three goals for lack of time.¹⁸⁵ By promising “further investigations into our scientific geology, both with a view to advance the science, and to make a practical application of any new discoveries,” he gave more than a hint of his ambition, but these investigations also had to be postponed if he was to meet his deadline.

Chemical analyses of soils and minerals took up all Hitchcock’s allotted time for the reexamination. He was using a new method of analyzing soils developed by Samuel L. Dana (1795-1868), a Lowell specialist in manures and compost. His description of the method shows its time-consuming process in fascinating detail. He devised an apparatus that allowed the simultaneous analysis of ten different samples by using an oven, filters, evaporating dishes, thermometers, sand baths, and more. He openly declared his aim wasn’t just to analyze and describe economic resources, but also to have the state encourage the use of chemistry to improve agriculture. Two valuable substances in his report, beryl and marl, appear also in his correspondence with Silliman. From early December 1837 through mid-April 1838 they exchanged letters about marl and a valuable crystal of beryl that Hitchcock had found in Royalston, not far from the Vermont border. He hoped for a monopoly of the beryl site (Silliman encouraged him), probably less for pecuniary reasons than for the privilege of being the one who made it known. Depending upon its color, transparency, and size, a hexagonal crystal of beryl is sometimes a gemstone. Marl, on the other hand, has value in its bulk. It’s a lime-rich mudstone or soil that is useful in agriculture because it’s a soil conditioner that neutralizes acid. Massachusetts soil, Hitchcock found, was generally deficient in lime, so he was glad to learn from Silliman that Farmington, Connecticut, had rich deposits of marl that could be a nearby source.¹⁸⁶

By January 1839, the Amherst geologist was committed to a major reworking of his state survey of 1833 and 1835. His Report on a re-examination of the economical geology of Massachusetts, after further revisions, would become the first part of his Final report which was published in 1841, much delayed by despondency and constantly evolving researches. Meanwhile, Charles U. Shepard published a friendly review of Hitchcock’s Re-examination in Silliman’s journal.¹⁸⁷ He recapitulated Hitchcock’s findings in some detail, folding in lengthy excerpts, and regarded favorably his former teacher’s adoption of Dana’s methods.¹⁸⁸

Hitchcock’s growing renown, 1840 and 1841

In several ways, Hitchcock reached the summit of his career in 1840 and 1841. Two books and national honors in that pair of years brought him enduring renown. In April 1840, he was elected chair of the Association of American Geologists at the first of its annual meetings (in 1848 it morphed into the American Association for the Advancement of Science.) In August that year he published a best-selling college textbook on geology,¹⁸⁹ and a year later appeared his Final report, the rewritten and much expanded successor to his 1833 report on the state’s geology. Meanwhile, in April 1841 he delivered an address in Philadelphia that was a veritable history of American geology; it was published that summer and again on the following January (“First anniversary address”). Before I look at these publications, I need to summarize the state of Hitchcock’s activities in the late 1830s that prepared the way for them.

With the birth of daughter Emily in November 1838, the Hitchcock family was complete: six children ranging from Mary, aged fourteen, to the newborn.¹⁹⁰ They all appear in a tiny lithograph of 1839, Orra’s

¹⁸⁵ Hitchcock composed a lengthy “Catalogue of paintings executed in 1838 for the government” (EOH, box 12, folder 1), listing more than 200 fossil impressions of all kinds. Silliman was interested in these drawings (12.5.37) but apparently they were never done.

¹⁸⁶ Both men had an interest in this marl, which Hitchcock separately analyzed and published a year later: Hitchcock, “Analysis of marl from Farmington, Conn.,” *AJS* 36, 1 (July 1839): 176.

¹⁸⁷ Shepard, “Notice of a Report on a re-examination of the economical geology of Massachusetts, by Edward Hitchcock,” *AJS* 376, 2 (July 1839): 363-78. “Communicated by Professor C. U. Shepard, at the request of the Editors.” Shepard (1804-1886), first a student and then a teaching colleague of both Silliman and Hitchcock, had published *A report on the geological survey of Connecticut* (New Haven 1837), a study commissioned by the state.

¹⁸⁸ Shepard made the caveat that Dana’s simple salt was probably a family of salts. In his estimation, recognition of this would reduce slightly the ratio of phosphate of lime that Hitchcock attributed to Massachusetts soils.

¹⁸⁹ Hitchcock 1840.

¹⁹⁰ Mary (1824--1899), Catherine (1826-105), Edward Jr. (1829-1911), Jane Elizabeth (1833-1894), Charles Henry (1836-1919), and Emily (1838-1921).

frontispiece for Edward's *A wreath for the tomb*.¹⁹¹ Mournful though it sounds to modern ears, the title is given perspective by the happy frontispiece, "The return," that shows Hitchcock, descended from a stagecoach, being greeted by his family in front of their handsome house. Orra had loosely copied an oil painting commissioned by the proud father in 1838, Professor Edward Hitchcock returning from a journey.¹⁹² For the evangelical Hitchcocks, the contemplation of death and the moral triumphs over illness were everyday thoughts that didn't preclude awareness of life's pleasures. For Edward, the little book made evident the religious convictions that were vital to his science, although often expressed only in reticent terms in his mainly secular geology.

By the late 1830s the Hitchcocks had become one of the most prominent couples in Amherst and its neighboring villages. Orra was remarkably productive in her own right. She had taught the sciences and decorative arts in her early years, and was a professional botanical illustrator. She had the care of six children, took in boarders to boost family finances, managed the family farm, occasionally taught art to local residents, provided Edward with drawings and large classroom charts, and generally was the indispensable helpmeet to her often despondent husband.¹⁹³ She and Edward were principal supporters of Mary Lyon's successful efforts to found the Mount Holyoke Female Seminary—later Mount Holyoke College—in 1836; she lived with the Hitchcocks for a time and taught their children. Edward's writings and teachings were central to the seminary's curriculum, and Orra provided a sketch for its diploma vignette that inspired the institution's seal.¹⁹⁴ In Amherst and in nearby parishes, Edward regularly gave sermons, and the couple were eager leaders in the local temperance movement. Edward's growing collection of fossil footmarks, the largest in the country, drew eminent visitors, including Charles Daubeny, as we have seen. He was also adding hundreds of specimens of rocks and minerals, many he was collecting himself in Massachusetts, others he purchased from abroad.¹⁹⁵

Hitchcock's gatherings of geological specimens served two purposes, the expansion of his college's "cabinet," and the establishment of a collection for the state. His correspondence with Silliman documents his intention of furthering his 1833 and 1835 reports with new researches in geological formations and soil analysis that would lead to a definitive publication, his Final report. It went through many drafts from 1839 to the summer of 1841, borne along by the constant anxieties revealed in his letters. Already in early 1838 he was committed to a complete overhaul of his earlier reports when he published his Report on a re-examination of the economical geology of Massachusetts. He had no authorization then for a final report, but he must have felt certain that the reexamination would convince the governor to authorize a broad renewal of the survey, as indeed he did in April 1839.¹⁹⁶ Silliman gave him moral support and often lent important books, not only out of friendship but also because he was convinced of the importance of the survey, portions of which he hoped to publish in his journal. He responded well to Hitchcock's wish to broaden the reach of Massachusetts geology, and sent him samples of rocks and soils from New Jersey and Maryland.¹⁹⁷

Always keeping in mind his renewed survey of the state's geology, Hitchcock intended to incorporate his 1838 Re-examination into the final publication. This he did eventually, although he added more analyses of soils and made other changes before the 1841 report was ready. More surprisingly, he also aimed to include in it a comprehensive summary of geology, a pedagogical component that was a bit too much for the governor. In mid-June 1839, Everett told him that he lacked authority to allocate funds for printing "the elementary introduction" of some 200 quarto pages.¹⁹⁸ Hitchcock was certainly not going to allow his substantial manuscript to fade away, so he published it at his own cost in August 1840 as *Elementary geology*. When Silliman thanked him for a copy of the book, he wrote back (12.12.40) "I thank you for your favorable opinion of my little work on geology. I should not have written it had I not wanted an abstract of it for my Report; & now behold, I shall not find room in the space allowed to my report by the Government for a single page!" He nonetheless found room in the Final report for an "abstract" of nearly 100 pages. He had disarmed the governor by treating it not as an introduction, but as Part IV of the two-volume treatise.

¹⁹¹ More fully: *A wreath for the tomb, or extracts from eminent writers on death and eternity, with an introductory essay and a sermon on the lessons taught by sickness* (Amherst 1839-1840).

¹⁹² Oil on canvas, 25 x 26 1/4 in., Mead Art Museum, Amherst College. Unsigned, but almost certainly painted by Robert Peckham (1785-1877), an itinerant painter of the region. Cat. 44 in Herbert and D'Arienzo 2011.

¹⁹³ See Daria d'Arienzo, "The 'Union of the beautiful and the useful': through the eyes of Orra White Hitchcock," *The Massachusetts review* 51, II (2010): 294-344.

¹⁹⁴ For the sketch, see cat. 42 in Herbert and D'Arienzo 2011.

¹⁹⁵ See Hitchcock, "Specimens of minerals and rocks," *AJS* 39, 1 (Oct. 1840): 199-200.

¹⁹⁶ Everett to Hitchcock, 4.12.39, in EOH, box 3, folder 12.

¹⁹⁷ See letters exchanged by the two men from 12.5.37 to 4.14.38.

¹⁹⁸ Everett to Hitchcock, 6.5.39, in EOH, box 3, folder 12.

He tailored his manuscript so that as a separate volume it could become a basic college textbook. In that he was successful. Elementary geology went through an astonishing thirty-one editions over the next twenty years! Constantly revising it by keeping abreast of the latest scientific publications and, presumably, by lending an ear to student responses, he created a best seller. It was adopted by many of his American colleagues whom he listed in prefaces to subsequent editions. At 329 pages in small octavo, the book was a handy volume to carry about. Orra provided it with many dozens of small wood engravings of geological sections and phenomena, some of them based on Massachusetts sites. They were closely keyed to the text, whose simple—but not simplistic—presentation made it much more accessible than Silliman's edition of Bakewell.

Hitchcock made a historical summary of modern geology, characterizing each of the major concepts and outlining their findings. He drew again on De la Beche (see above), borrowing from Silliman (4.26.40) the latest edition of that author's A geological manual. He only reluctantly endorsed the new classifications "Silurian" and "Cambrian" which had recently been put forward by Sedgwick and Murchison. He used the two terms, but also the older ones "transitional" and "graywacke." He wrote that De la Beche "objects to these substitutes for Graywacke, except as mere local designations, on the grounds that it is unwise to change old terms until we can be sure that the new terms will answer for the whole earth."¹⁹⁹ In so many words, he used De la Beche, who was openly opposed to Sedgwick and Murchison, to voice his own reluctance to accept new theories without reservations.²⁰⁰

New England "diluvium" continued to be one of Hitchcock's special interests, so he took twenty pages to describe his own investigations of boulders and striations atop the region's highest mountains, and the prevailing southern movement of the diluvial drift. He felt that glaciers were too local to account for the vast sweep of the drift, found elsewhere in the eastern states flowing southward, but he could offer no theory that explained this "diluvial agency," especially because it flowed up over such heights. Modern readers can't resist crying out for Agassiz—diluvium is glacial till—but his crucial theory had to await one more year for Hitchcock to broach it in his Final report. The most unusual feature of Elementary geology, and its most forward-looking, is its frontispiece, a fold-out colored "Paleontological chart" in the form of two branching trees, one for plants and one for animals. A modern agronomist called it the first known "tree of life" that records both paleontological and geological information.²⁰¹ Along one branch, Hitchcock traces birds back to his Connecticut Valley footmarks, but like other animals and the plants on his chart, birds are laid out in a chronological sequence up to the present, without suggesting a proto-Darwinian evolution.

In a book addressed to students, Hitchcock gave prominence to the reconciliation of science and religion which was often the subject of his college sermons.²⁰² He went over the ground made familiar from his earliest publications but reinforced the view that would most offend fellow Calvinists: Geology shows "that violent and painful death was in the world before the fall of man," and therefore not a consequence of man's sin. (p. 274). To earlier rehearsals of his views, he added the findings of John Pye-Smith, a British dissenting theologian who was also a Fellow of the Geological Society. Pye-Smith formulated an ingenious if strangely literal reading of Genesis that could make it compatible with the latest geology.²⁰³ He didn't believe with Hitchcock and Silliman that the "days" of Genesis were long eras because it and its flood referred only to a discreet region in the Near East (and Noah's animals were only a selected few), while the rest of the globe was undergoing all the effects that modern geology had revealed. Pye-Smith incorporated the work of recent authors, including Murchison, Sedgwick, and their Silurian and Cambrian classifications. In an exchange of letters in 1840 and 1841, Hitchcock and Silliman express their admiration of Pye-Smith despite disagreeing with his interpretation of Genesis.²⁰⁴ They valued him because of his detailed quotations and exegeses that gave geology and paleontology more credit in discussions of religion than in any other theologians's publication. Hitchcock invited him to introduce the second edition of Elementary geology (see below).

Through 1839 and 1841 Hitchcock juggled work on his college textbook with a massive reworking of his report of 1833. At some point in 1839 he completed the geological map that would appear, with some

¹⁹⁹ Hitchcock 1840, p. 36. He refers to De la Beche's "*Report on the geology of Cornwall and Devon*, p. 38. London, 1839."

²⁰⁰ See Martin J.S. Rudwick, *The great Devonian controversy* (Chicago 1985).

²⁰¹ J. David Archibald, "Edward Hitchcock's Pre-Darwinian (1840) 'Tree of Life,'" *Journal of the history of biology* 41, 3 (Fall 2009): 561-92. Hitchcock himself wrote (*Elementary geology*, p. iii): "When first prepared I had supposed this method of illustration entirely new: but I find it has recently appeared in Germany." The German publication hasn't yet been identified, nor has the artist who drew Hitchcock's frontispiece.

²⁰² See in EOH, boxes 6 to 9.

²⁰³ Pye-Smith 1839.

²⁰⁴ Hitchcock to Silliman, 1.12.40, 4.26.40, and 12.12.40, and Silliman's replies, 4.29.40, 1.12.41, and 6.28.41.

revisions, in the Final report. Such maps that accompanied geological treatises were of great importance and sometimes circulated independently of a published book. At the end of 1839 Hitchcock sent a copy of it to the Geological Society of London.²⁰⁵ When published with the Final report, the map shows rock formations in six colors applied by hand “which, with the exception perhaps of the blue, are so strongly marked, that they can be readily distinguished by candle light.”²⁰⁶ The map has been regarded as the first soil map ever published because it allows one to calculate fourteen varieties of soil in relation to the rocks they derived from.²⁰⁷ It was based on many months of probing the state’s quarries, mines, road and canal cuts, and exposed rocks. Hitchcock didn’t have time or money for deep geological soundings, but he had an acute observational ability. Another proof of this: He correctly described impressions of raindrops on Connecticut Valley jurassic stone, the first to do so in the US.²⁰⁸

In early April 1841, Hitchcock was doubly honored at the second meeting of the Association of American Geologists. A committee appointed the previous year reported very favorably on his work on the footmarks,²⁰⁹ and he had been asked to deliver the “First anniversary address.” In this lengthy speech he brought native geology up to the current day. He went beyond the limited acknowledgment of Silurian and Cambrian that he had made in Elementary geology to a full embrace of the concepts. Fellow geologists, he wrote, have identified strata in Pennsylvania, New York and further west that matched Murchison’s Silurian rocks, and have now called the old red sandstone in America the “Devonian system.” This means that “we have found, if I mistake not, so full a development of the European formations on this side of the Atlantic, that it would not be strange, if at no distant period, this country should become classic ground for their study.”²¹⁰ Hitchcock summarized other recent work by American geologists, including the discoveries of fossil siliceous infusoria by Jacob W. Bailey and W. B. Rogers. These deposits, many feet thick, gave new impetus to microscopic paleontology. Close to his own interests were the applications of organic and analytical chemistry to agriculture, especially to the analysis of soil and the composition of organic humus. Faithful to his romantic naturalism, he ended his address with a moving paragraph on sublime landscape.

At the time of his address, Hitchcock hadn’t yet read Agassiz. In late May 1841, Silliman sent him *Etudes sur les glaciers* (1840). It struck him with the force of revelation as, indeed, it had many others.²¹¹ While reading Agassiz’s book and abstracts of papers by him, Buckland, and Lyell, on ancient glaciers in Scotland and England, “I seemed to be acquiring a new geological sense.”²¹² In his “Address” in early April and concurrently in his draft of the Final report, Hitchcock had mentioned Agassiz’s theory based on indirect knowledge; he said it was justified for the Alps and its downward slopes, but not otherwise. However, as soon as he had Agassiz’s book in his hands, he saw that his diluvial phenomena were actually the results of masses of ice moving southward over New England. Immediately he began revising his April address for publication. He added a summary of the Swiss scientist’s theory which, he wrote, explained everything he had been calling “diluvial.” In mid June Silliman

²⁰⁵ The Society sent a receipt dated January 6, 1840, for “your topographical & geological maps of Massachusetts made by order of the Legislature, mounted on roller, with the ‘Explanation.’” (EOH box 3, folder 13).

²⁰⁶ Hitchcock 1841, *Final report*, vol. 2, p. 305.

²⁰⁷ A. B. Beaumont, “Note: The Oldest Soil Map,” *Journal of the American Society of Agronomy*, 23 (March 1931): 241-42. “The present writer is of the opinion that this map of Hitchcock’s is the first map on which any one attempted to show the classification of soils over any considerable area.”

²⁰⁸ In reporting on recently found stony impressions of raindrops in Great Britain, Silliman wrote that “Prof. Hitchcock of Amherst, Mass., is also disposed to believe that he has found similar appearances in the sandstone of the Connecticut river valley, and we understand from him that a specimen of the stone has been taken to England by Prof. Shepard for the purpose of comparison.” (AJS 37, 1 [Oct. 1839]: 371). Ever the diligent investigator, Hitchcock countered Shepard’s negative report by successful experiments with raindrops on clay (Hitchcock to Silliman, 1.12.40).

²⁰⁹ Silliman reprinted the committee’s report, AJS 41, 1 (Oct. 1841): 165-68. This endorsement was important because among the doubters had been the esteemed geologist T. A. Conrad (see Hitchcock to Silliman, 1.12.40).

²¹⁰ Hitchcock 1841-42, “First anniversary address,” p. 246. Here Hitchcock took a more forward position than some of the geologists charged with state surveys. Charles T. Jackson, for example, in his survey of Rhode Island published in 1840, not only cast doubt on paleontological evidence for establishing the relative age of rocks but, according to Benjamin Silliman Jr., “He prefers also the Wernerian division of transition rocks to the ‘names Cambrian and Salurian, proposed for certain groups in England,’ which he thinks ‘will never be regarded in this country as appropriate terms for our rocks.’” Benjamin Silliman Jr., “Report on the geological and agricultural survey of the state of Rhode Island in 1839,” by Charles T. Jackson (Providence 1840), AJS 40, 1 (April 1841): 182-94, p. 183. The review is dated Jan. 1, 1841.

²¹¹ In June Silliman told Hitchcock about the excitement in Great Britain as geologists reevaluated northern glaciers in light of the Swiss scientist’s theory. (6.15.41).

²¹² Hitchcock 1841, “First anniversary address,” p. 253.

printed the revised address.²¹³ At about the same time, Hitchcock inserted an extensive “Postscript” to the Final report that reprinted the section on Agassiz from his address. The rest of the book was already set in type, so the postscript was tucked in at the beginning of the volume. At last in September the constantly revised report was published and dispatched to Silliman.²¹⁴

Hitchcock’s postscript was the first major adoption and explanation of Agassiz in America. He found there a vindication of his own work on southerly flowing diluvial drift that many colleagues had objected to. First he recapitulated the evidence he had uncovered of these gravelly and rocky accumulations, then applied Agassiz to them. He printed copies of several plates from *Etudes sur les glaciers*, and added prints of glacially scoured and smoothed rocks from New England.²¹⁵ To his map, already in press, he added the word “moraine” to many places where he had already identified streaks of “detritus,” and in his text identified them as “terminal” or “lateral” moraines; he had one plate (no. 53) redrawn, a “Map showing strike an dip of the strata [and] the course of the diluvial furrows . . .” Although he accepted Agassiz’s central findings, he wrote that it would need modification when applied to America. “Glacial theory” wasn’t fully expressive of the phenomena, he wrote, so he preferred “glacio-aqueous” action because it spoke better for the effects of water flowing from glaciers and later when ground water cut across or dispersed moraines. He also couldn’t envision the northern ice cap as thick as Agassiz’s theory would require, although he posited it to have been 2000 or 3000 feet thick—already a staggering conception. Because he had observed sets of glacial furrows that crossed one another, he very presciently concluded that there had been more than one massive layer of ice, and that these had advanced and then retreated.

Hitchcock had signed Final report “Dec. 1, 1839,” but that was only its initial stage; it didn’t leave the press until September 1841.²¹⁶ He arranged for its publication in Amherst and Northampton, spending the government’s allocation there rather than use the state’s own press which would have cost more.²¹⁷ The governor attempted to limit the number of lithographs, then more costly than wood engravings, but Hitchcock prevailed so there were fifty in the two volumes.²¹⁸ The faithful Orra made drawings for seven of these: three landscapes, two of fossil impressions, and two of the tracks of living animals for comparison. Edward credited her also with twelve of the wood engravings in the first volume, and she supplied many of the unattributed engravings in the second.²¹⁹ Their intimate collaboration gave Hitchcock’s report a particular distinction. Taken together, the lithographs and the dozens of engravings are a far more abundant visual resource than any of the contemporary reports of other states’ geologies.

The Scenographical Geology embraces a description of the most remarkable natural scenery of the State, accompanied by drawings of the most interesting spots. These drawings I have succeeded in obtaining through the liberality of several artists, who have gratuitously accompanied me in my tours; and though they should be engraved in plain style, they may aid in calling the attention of our citizens to striking features in our scenery, that are now generally passed unnoticed. This is the chief object of this part of my Report: and if I succeed in it, I shall feel as if an important point were gained. (vol. 1, p. iii).

Unlike Henry D. Rogers, Charles T. Jackson, and other state geologists, Hitchcock was so much the romantic naturalist that he gave one-fourth of his report to “scenographical geology.”²²⁰ In the 1833 report it was “topographical geology,” but by 1841 he was even more engaged in promoting the state’s scenery. He urged readers to escape summertime heat by going to the Berkshires, avoiding “the beaten track to places of fashionable resort, where more is often lost in morals than is gained in health.” (p. 228). From a Berkshire summit, he exclaimed as though standing there, “O what a glorious display of mountains all around you! and how does one in such a spot turn round and round, and drink in new glories, and feel his heart swelling more and more with

²¹³ Silliman printed it on behalf of the Association, looking forward to republishing it his journal: *AJS* 41, 2 (Jan. 1842). See Silliman to Hitchcock, 6.15.41, and Hitchcock to Silliman, 9.16.41.

²¹⁴ Hitchcock to Silliman, 9.16.41.

²¹⁵ The copies after Agassiz’s plates were probably made by Orra; one of them she copied very roughly as a lecture chart (cat. 92, in Herbert and D’Arienzo 2011).

²¹⁶ See Hitchcock to Silliman, 9.16.41.

²¹⁷ See Everett to Hitchcock, 11.25.39, in EOH, box 3, folder 12.

²¹⁸ For the governor’s wish to limit illustrations, see his letters to Hitchcock on 6.5.39 and 11.25.39 (EOH, box 3, folder 12).

²¹⁹ She also might have been responsible for the “tree of life” in Hitchcock 1840, and perhaps aided in the preparation of maps

²²⁰ Rogers, *Description of the geology of the State of New Jersey being a final report* (Philadelphia 1840). Except for a frontispiece, there are no illustrations; the text is limited to descriptions of rocks and formations, and analyses of clays and marls, without regard to geological history or theory. Jackson’s surveys of Maine and Rhode Island are nearly as devoid of landscape enthusiasm, except for an occasional “picturesque” and “beautiful.”

emotions of sublimity, until the tired optic nerve shrinks from its office.” (p. 239) He quoted from Wordsworth’s “The Excursion” to exalt the power of such a view on one’s sensory and poetic expressions.²²¹ In order to enjoy such a view, obscuring trees must be removed, “the axe should do its office, until the summit is cleared.” (p. 235). He was glad to report that similar advice he gave in 1833 when describing Mount Greylock had been followed, and a roadway was progressing up the slope. In these early days of native tourism, Hitchcock was merging his nature worship with the “Economical geology” of his mandate. For that matter, his more prosaic and detailed descriptions of particular roads and localities, which take up seventy pages of the report, served several practical purposes and at times can read like modern “roadside geologies.”

Hitchcock’s 1841 report wasn’t like studies of particular regions by contemporary British geologists such as De la Beche, Sedgwick, and Murchison. They were writing for fellow scientists and wholly engaged in formulating new concepts and classifications. Instead, facing a public of laymen, Hitchcock wished to instruct them sufficiently in geology to make sense of his professional findings, but he didn’t expect them to have more than a rudimentary acquaintance with his science. Much as he had in *Elementary geology*, he maintained the old classification of Graywacke and subdivided it into the new concepts of Silurian and Cambrian. In his crucial “Tabular view” of geological sequences (pp. 303-4), both the old and the new terminology are placed side by side.

In *Final report* the lengthy discussion of the Mosaic controversy in *Elementary geology* was reduced to three pages, an abbreviated attempt to disarm religious objections to modern geology. He had been regularly attacked by conservative theologians for his refusal to accept Genesis literally, and he had to face both religious and secular doubts about identifying fossil impressions of pre-biblical age. He was also alert to politics in the most ordinary sense of that term, for he knew about opposition to the state’s expenditure on a geological survey. In fact, the governor had to go to bat for him:

So long as the scientific surveys were kept out of the vortex of party spirit, they presented little to embarrass the government; but as the demagogues have thought proper to make them the subject of attack, it is absolutely necessary to avoid their being . . . abruptly cut off, that great discretion & prudence should be exercised in reference to every question connected with them. It required all the influence I could bring into action to prevent the operations on the State map from being abruptly terminated the last spring.²²²

Both the governor and he had a stake in the importance of his survey and the degree to which it could redound to the state’s glory. The governor, to whom he had sent sample footmarks, was probably as proud as Hitchcock of Massachusetts’ unique fossil remains that were causing such a stir in paleontological circles; the new report trumpeted new terms for the much larger number of stony footmarks Hitchcock had uncovered. Legislative approval of the report in April 1839 stipulated that copies were to be distributed to many libraries in the state (individually named), all state representatives and high government officials, each lyceum, atheneum and academy, one to several historical societies (named), one “to the Executive of each State in the Union,” and two to “the library of the United States.”²²³

Hitchcock’s *Final report* made 1841 a banner year for him. It was truly a year of astonishing productivity that few others could have matched. His report was first completed in the spring, and then rewritten in early summer. At the same time, he rewrote his address to the Association of American Geologists, and he considerably revised his *Elementary Geology*, with an introduction by Pye-Smith. In all three publications he excitedly summarized Agassiz’s glacial theory, and in the first and third of these he inserted several plates, some copied from *Etudes sur les glaciers*. He was as advanced as any other American geologist and more so, than most. He insisted upon the transatlantic continuity of rock formations despite the doubts of some colleagues, and he deployed the new classification of Silurian, Cambrian, and Devonian. While doing all this, he taught a full schedule of classes. Orra had the principal role in family life, but he taught his children music and botany and took an active role in Amherst cultural life. Silliman also kept busy in 1841 as teacher, sought-after lecturer, and editor of the *American journal of science*. However, fifteen years older than his Amherst colleague, he no longer had the energy for original research and settled well into the life of a doyen.

²²¹ Wordsworth, “Ah that such beauty, varying in the light / Of living nature, cannot be portrayed / By words, nor by the pencil’s silent skill, / But is the property of him alone / Who hath beheld it, noted it with care / And in his mind recorded it with love.” From “Discourse of the Wanderer, and an Evening Visit to the Lake,” 1814.

²²² Everett to Hitchcock, 6.22.39, in EOH, box 3, folder 12.

²²³ Hitchcock 1841, *Final report*, vol. 1, p. vii. The distribution also included “one copy to the State Lunatic Hospital at Worcester.”

Part three, the final decades, 1842-1863

After 1841, Hitchcock innovated less in geology, although he kept abreast of changing concepts and discoveries by constantly revising *Elementary geology*. However, he established himself as one of America's foremost paleontologists by constant revisions of his work on fossil footmarks; his nomenclature has entered into the historical record. From 1841 to 1863 he published twenty-five articles on geology, mineralogy, and paleontology in Silliman's journal. In 1845 he was named president of Amherst College, a post he kept for nine years. Despite his new role, he maintained his teaching, frequent sermonizing, and a steady pace of publication. The Mosaic controversy continued to be central to his thinking. He brought together several of his articles for *Religion of geology* in 1851, a book that was republished five times before 1860. While he and Orra were in Europe in 1850, he was commissioned by the state to look into agricultural instruction, a logical assignment because for years he had been making public appeals for scientific agriculture, including passages in his Final report. In January 1851 he deposited with the state a report that laid out the curriculum of the future Massachusetts Agricultural College (later the University of Massachusetts).²²⁴ He continued to revise and add to his studies of the fossil footmarks, gradually acknowledging them to be the steps of dinosaurs except for a few he retained as the imprints of birds. His *Ichnology of New England* of 1858 was the summa of his contributions to paleontology; some of its classifications of animals are still used today. His last major work on geology is the *Report on the geology of Vermont*, 1861, for which he was the chief investigator and author.

The letters exchanged between Edward Hitchcock and Benjamin Silliman, so abundant in the early years, diminished considerably after 1841. From 1842 to 1863 only forty-five letters between them have survived, although internal evidence makes it clear that another fifteen or twenty (mostly Hitchcock's) have disappeared. Silliman was now less involved in editing the *American journal of science*, which had prompted much of their earlier correspondence. His son Benjamin Jr. (1816-1875) had taken on some of the burden beginning in 1838; he occasionally wrote Hitchcock and some of his letters (often postscripts to his father's) are included here.²²⁵ More significantly, James Dwight Dana (1813-1895) became co-editor in 1846. These changes allowed Silliman to expand his parallel career as public lecturer throughout New England and the country east of the Mississippi. Hitchcock, for his part, as president of Amherst College from 1845 to 1854, had to devote his time to new duties that included writing several hundred business letters each year, which left him with less time for communicating with his Yale colleague.

Silliman was always far better known than Hitchcock, being one of Yale University's most distinguished professors, a sought-after public speaker, a prominent mining consultant, and editor of the *American journal of science*. His journal was the clearing house for the sciences in America, so he knew all its chief practitioners and had close friendships with more than a few. He corresponded with European scientists in all fields, among them William Buckland, Charles Daubeny, Charles Lyell, Gideon Mantell, Roderick Murchison, Adam Sedgwick, and Richard Owen. He was host to several of them when they visited the US. Hitchcock couldn't match the extent of Silliman's professional acquaintance. He welcomed visits in Amherst from Daubeny and Lyell, and occasionally corresponded with Buckland, Mantell, and Owen, but his professional relations were largely limited to American colleagues. In the US he was well known for his reports on the geology of Massachusetts, his publications on the fossil footmarks, his presidency of Amherst College, and his prominent roles in the Association of American Geologists and its successor, the American Association for the Advancement of Science. His theological lectures, sermons, and articles gave him fame (and notoriety!) in religious circles. In Europe his geological reports on Massachusetts were admired, but across the Atlantic his only claim to serious attention was for his work on the fossil footmarks. Nonetheless, he continued to do original research in geology and paleontology until his final years.

The letters from their later years principally engage issues of geology and paleontology. Even more than their earlier correspondence, their exchange discloses the striking differences between them. Hitchcock, always aware of his limitations compared to his colleague's eminence, filled his letters with emotional outbursts which Silliman then had to soothe thanks to his deep reservoir of patience and tact. One of the attractions of this correspondence is to see how skilled he was in bringing Hitchcock around to reason, an example of his superlative

²²⁴ For the 1850 visit to Europe, see Herbert 2012.

²²⁵ See his letter of 8.12.42 to Hitchcock in which he copied the delightful satire by an Amherst tutor (Dana wrote the music) of Hitchcock's poem "The Sandstone Bird." He frequently sent Hitchcock books and laboratory materials: see Hitchcock's letter to father and son, 1.29.44.

editorial talents. Because Silliman has been better studied,²²⁶ I shall summarize his activities after 1841 in a few paragraphs, followed by a lengthier treatment of Hitchcock, who has suffered from neglect despite his high place in mid-nineteenth-century science. As I have in earlier portions of this introduction, I shall write only briefly of Hitchcock's biography, concentrating instead on his publications, particularly on paleontology. I'll gather my observations in four interpretive sections: Science and the Bible, 1842-1863; Rocky strata and drifting boulders, 1842-1863; Hitchcock's controversy with James Deane, 1842-1845, and Fossil sandstone impressions, 1844-1863.

Silliman, 1842-1864

In 1843, when he gave the sixth annual Lowell lecture in Boston, Silliman was America's best known public speaker in the sciences. By then he had more time for outside activities because his son had become an assistant editor of the American journal of science, and Dana had signed on as co-editor in 1846. Silliman attracted many hundreds to each of his lectures in the natural sciences, usually a series of three or four in successive days. They were engaging performances enhanced by huge drawings and charts as well as by striking demonstrations on his electrical apparatus, specially built to accompany him. He lectured in New York, Baltimore, Pittsburgh, New Orleans and other major cities, declaring that his last lectures were those he delivered in St. Louis in 1855, at age seventy-five (see his letters to Hitchcock of November 1855). Even so, he relented in 1857, when he gave his final public talks in Buffalo. He had continued his occasional work as mining consultant to industry, sometimes aided by his son. He examined whole regions on horse and foot, from forays through Illinois and Missouri in 1844 to look for coal and minerals, until a final campaign to survey copper in the Blue Ridge Mountains in Virginia in 1855.

Silliman's renown across the country sprang from his prominence as Yale's most famous scientist and editor. His impact on the New Haven campus was felt well beyond his classrooms. He was instrumental in setting up a curriculum for scientific agriculture in 1846, and the following year he was the key figure in establishing the Department of Philosophy and the Arts (later the Graduate School), with his son and John P. Norton as professors. Further, exploiting his fame and his special interests, he was behind the founding of the School of Applied Chemistry in 1847, followed by the School of Engineering in 1853; the latter two were consolidated as the Yale Scientific School (later the Sheffield Scientific School). He finally retired in 1853 at age seventy-four (Hitchcock was then sixty). His professorship was in effect divided in two. Benjamin Jr. was professor of chemistry and Dana, professor of geology; both had distinguished careers of their own.

Silliman's home, an elegant town house on the edge of the university, was open to his colleagues, including Hitchcock who visited more than once, with his wife. The two couples knew one another well, and their children met occasionally.²²⁷ The Sillimans lost four children in infancy, but in addition to son Benjamin, they had three daughters who "married well" in the parlance of the day; Henrietta was the wife of Dana who therefore became Silliman's son-in-law as well as his co-editor and successor. In January 1850, Silliman's wife Harriet Trumbull Silliman died after a long illness. Silliman thought seriously of retiring then, but was prevailed upon to continue for two more years, perhaps to palliate the loss of his wife.

In March, 1851, Silliman took leave of absence and went to Europe for six months, accompanied by Benjamin Jr. and several family members. He traveled in England, France, Italy, Germany, and Switzerland, visiting many scientists with whom he had long corresponded, and many collections and institutions he had publicized in his journal. In the preceding year, Hitchcock and his wife had made their own extended tour of Western Europe, but on a contrastingly modest budget (see below, when I compare the two tours). Silliman was already known as a cosmopolitan traveler, for in 1810 he had published his tour of 1805-1806 in England, Scotland, and Holland, and in 1822, A tour to Quebec in the autumn of 1819. He memorialized his mid-century tour in 1853 in two volumes, A visit to Europe in 1851.²²⁸ The first two travel books have the appeal of a neophyte venturing beyond his home territory, but in his new account he shows his familiarity with decades of more sophisticated travel literature. He must have planned the book when he set out, because it often has the tone of a vade mecum in which autobiography mingles with tourist itineraries.

²²⁶ I draw my account from Fisher 1866, John F. Fulton and Elizabeth H. Thomson, *Benjamin Silliman 1779-1864, pathfinder in American science* (New York 1947), and Leonard G. Wilson, ed., *Benjamin Silliman and his circle: studies on the influence of Benjamin Silliman on science in America* (New York 1979).

²²⁷ For example, see Silliman to Hitchcock, 9.13.43 and 10.27.52.

²²⁸ Hitchcock praised Silliman's travel account for its "attractive elegance & clearness," in a letter of 11.3.53.

Shortly after his return from Europe in the fall of 1851, Silliman married Sara Isabella Webb, with whom he shared his tranquil last decade. His exchange of letters with Hitchcock dried up in 1850 and 1851, partly because of the travels they undertook, but partly because of a frost in their relationship because Silliman was disappointed at Hitchcock's failure to acknowledge his views in his *Religion of Geology* (1851). Indeed, Silliman was as persistent as his colleague in declaring the harmony of modern science and the bible, usually concluding his lectures with such an assertion although he didn't publish separate articles on the subject. Hitchcock's apology (Oct. 16, 1852) restored good feelings, and the two resumed their former relationship. Their paths crossed occasionally in Amherst and New Haven and at professional meetings. The common theme of most of their letters was Hitchcock's continued study of the sandstone tracks and Silliman's reactions. Letters became less frequent, with small flurries in 1855 and 1858.

Two letters of February 1858 are the only ones that involve national politics. In 1856 Silliman, who had always been staunchly against slavery, paid for the first rifle that Connecticut men would take to Kansas to defend anti-slavery settlers against the invasive slaveholders of Missouri. He was among those who in 1857 addressed a protest to President Buchanan for his proslavery actions; his protests gave him national notoriety. In February 1858, he was defended in the Senate by Connecticut's James Dixon in a speech opposing Buchanan in which he singled out Silliman as one of the country's most distinguished scientists. Hitchcock wrote his friend on February 28 that he had read Dixon's remarks "& think he couldn't in justice have said less. But whether you will consider his eulogy more creditable than the vituperation of President Buchanan & others, I am in doubt: For in respect to the abuse we receive from some men, we may say with Milton

'By whom to be disprais'd
Were no small praise.'²²⁹

Hitchcock was against slavery, but passively, and limited himself to joining three thousand ministers in signing a protest. Otherwise, as earlier, Hitchcock's letters express his self-centered interests, while Silliman's expose his more mundane and worldly-wise outlook. The former's soberness contrasts with the latter's wit. When new evidence threatened to displace Hitchcock's birds with four-legged marine animals, Silliman wrote "Should our early conclusions be subverted and should we be driven from an aviary into a frog pond, we must even submit and agree to croak, if necessary, not cackle or crow. Fiat veritas!" (Oct. 13, 1855). In February 1860, in his last surviving letter to Hitchcock, Silliman reveals the calm tenor of his final years. "I sit down with my good wife generally about 9, able to read aloud some interesting and instructive work. An hour & a half and more rarely two hours thus redeemed enables us to master miscellaneous works which otherwise might wait a long time on our table."

Hitchcock's life, 1842-1864

Hitchcock's life, both professional and private, was utterly different from Silliman's, not least because of his often frantic pace of work. Silliman published hardly anything of scientific interest after 1841, whereas the Amherst professor — fifteen years younger, we remember — was astonishingly productive. From 1842 to 1850, seventeen of his articles appeared in Silliman's journal (and two others involving his dispute with James Deane). In that same span he also published fourteen scientific articles in other journals, twelve secular papers read before scientific groups, eight pieces on Massachusetts scenery, five addresses that mixed science and religion, and more than a dozen sermons. Of those scientific publications, eleven articles and one book were devoted to paleontology (mostly fossil footmarks), fifteen articles to other aspects of geology, and two to agriculture. He also made a new edition each year of his *Elementary geology*, with corrections and additions.

Not listed among those publications are two others that give very different insights into his interests and his character. In 1845 he published an article about hallucinatory dreams he had in 1842.²³⁰ Suffering from fever, "I took morphine only once or twice, but think it rather increased the tendency to these hallucinations. Opium was not admitted in any of its forms, except occasionally as it exists in Dover's powders." [mixture of ipecac and opium]. He asked Orra, his children, and once an undergraduate to sit by his bed to record his dreams the instant he awoke, before they could fade. He believed these would be "a contribution to mental science." His dreams are quite wonderful! He saw living prehistoric monsters and—most fascinating to a post-Freudian observer—he once

²²⁹ Correctly "Of whom", from *Paradise regained*, book III, line 56.

²³⁰ "Case of optical illusion in sickness, with an attempt to explain its psychology," *New Englander* 3, 10 (April 1845): 192-215. In this article, Hitchcock recounted samples of his dreams and included an analysis of them by his colleague Nathan W. Fiske who taught intellectual and moral philosophy at Amherst. Fiske sensibly told his colleague that the feverish or nervous mind triggers perceptions and imaginations that blend together to give the illusion of reality.

dreamed he had left terra firma when “a party of us in a barouche seemed to come in sudden proximity with a barouche of ladies dressed in white, whom I understood to be from Saturn, and my impression is that we met somewhere near the orbit of Jupiter. In making our mutual salam we came near overturning our barouches, and the alarm of seeing the ladies from that distant planet, who were very large, about being tossed into our vehicle, awakened me.”

Another publication is a reminder that he preached for the temperance movement, to which he offered numerous lectures and this book: *History of a Zoological Convention held in Central Africa in 1847* (Northampton 1850). It’s a witty fable that, he wrote, “may excite more interest than a method more didactic.” Illustrated with amusing caricatures by Richard Hinsdale, the tale has animals take turns to address the African convention. Among the speeches: “The alligator’s speech against capital punishment, and in favor of moral suasion;” “Reply to the alligator’s speech, by an American deer;” “The rufescent ant proposes to introduce and extend slavery;” “Speech of the great ant-eater.” Also distant from his professional work, it would seem, was his interest in “animal magnetism” or “Mesmerism,” and a veritable enthusiasm for phrenology.²³¹ He encouraged the exploration of phrenology by two Amherst students of the class of 1834, Henry Ward Beecher and Orson Squire Fowler, who together demonstrated the “science” on campus and in neighboring towns.²³² In New York in 1847, Hitchcock was examined in the Fowler method by having his head minutely measured and analyzed; the results were entered in manuscript in Fowler’s book, *Synopsis of phrenology* (New York 1846) in blank spaces left for the analyst.²³³ It’s no surprise that these results were predictable: High marks for power of concentration, large self-esteem, decisiveness, veneration of supreme being and for being “resolute, courageous, spirited and efficient as an opponent.” He was given low marks for “ability to render one’s self agreeable;” and for “cognizance and recollection of succession, the lapse of time, dates, how long ago things occurred.” Phrenology had a great vogue in the first half of the nineteenth century, and those who believed in this pseudo-science were many, including Silliman.

Other glimpses of Hitchcock’s mostly hidden ideas and emotional life are found in a private journal that he kept until mid-century.²³⁴ It’s rather sad to read, but illuminating. It consists mostly of rather mawkish and rambling worries about poor health, dieting, premonitions of imminent death, and fears that he might not be worthy to be accepted in the “Mercy seat” of his Calvinist God. Even when in good health he worries: “perhaps my present comfortable state of health is only a short respite from the grave.” He details the hours and days spent working on his publications, always fretting over their reception and his reputation. Most revealing is the frequency with which he troubles over the competition between his scientific work and his devotion to God. His “most prominent unfavorable symptom,” he writes, is “inordinate worldly ambition or more definitely love of scientific distinction. I say scientific distinction: for I am not conscious of having sought after political or ecclesiastical distinction or to attract attention by showy equipage or extravagant & conspicuous living. But I have had a strong love of science and devoted to it my most vigorous days certainly since I became connected with a College. And I have reason to fear that the hope of distinction among scientific men has been with me a most powerful motive of action.” Hitchcock hoped he resolved this conflict in his sermons and tracts in which he continued the rest of his life to assert that science, properly conceived, supported the Bible.

The journal has surprising little about daily life and family, although there are frequent paeans in honor of Orra’s devotion and her salutary influence on him. His busy life is unimaginable without all that she gave him until her death in 1863. He was very much involved with their children, but it was she who managed the family garden, dairy, and animals, the boarders they often had, the welcoming of college colleagues and guests, and relations with townspeople. She did all this while being the principal illustrator of his lectures and publications: many dozens of classroom charts and drawings — some of them gigantic — and more than a thousand lithographs and wood engravings.²³⁵ She also accompanied him on some field trips; the captions of her prints for him show how far and how often they traveled together.

The Hitchcock children grew up in a house of educators who home-schooled them in addition to sending them to nearby schools. Orra taught the decorative arts and botany to her children (Emily Hitchcock Terry became a professional botanical illustrator), and probably biology. Edward taught them music and the several sciences. Edward Jr. became professor of hygiene and physical education at Amherst, and the other son Charles, professor of geology and mineralogy at Dartmouth. Mary Lyon, on the eve of founding the Mount Holyoke Female

²³¹ Tyler 1873, p. 33.

²³² See Claude Moore Fuess, *Amherst, the Story of a New England College* (Boston 1935), p. 113.

²³³ The copy of Fowler’s book, with manuscript notations by L. N. Fowler, is in EOH, File BF870.F8 1846.

²³⁴ Two volumes of this journal, written from 1829 to 1854 (mostly undated entries) are in EOH, box 19, folders 3 and 4.

²³⁵ See Herbert and D’Arienzo 2011.

Seminary (later College) in 1836, lived with the Hitchcocks for a year. She took a serious hand in the girls' education, and continued a close tutorial relationship with Mary, Catherine, and Jane for several years after opening the Mount Holyoke Female Seminary in 1837. All four girls attended the Seminary, two graduating, and two part-time. Orra gave a drawing for the Seminary's diploma vignette in 1838, and from the beginning, Edward not only frequently lectured there but also took a hand in the school's science curriculum.²³⁶

Only a few family letters survive, so there is little detail about daily life among the Hitchcocks. Edward's professional letters and publications show the public man and something of his temperament, but his inner self remains mostly veiled. There are a few aspects of his public life that give a hint of his complexity. Although one might expect him to match his admonitory sermons with a stern discipline of students, the opposite was true. His first biographer (really his only one!) William S. Tyler, thought that he was too indulgent a teacher, too paternal. "He never relished the traditional system of college pains and penalties. Like too many other hereditary notions and practices which prevail among the students, they seemed to him to savor too much of the dark ages. . . . He strove to rule in the hearts of the students. . . . Unwillingness to grieve their father restrained them from many an act of disobedience"²³⁷

The Hitchcock's lives became more charged in 1845, when he became president of the college. For several years enrollment had suffered and bankruptcy threatened. Hitchcock's colleagues gave an ultimatum to the trustees: the faculty would accept the declining income in lieu of salary, and Hitchcock would be made president. They were right to choose him. By 1847 the college was back in the black and enrollment restored. (The interim year 1846 is the only one of the decade in which Hitchcock published nothing.) Conscious of his workaholic activity, his colleagues urged a vacation. In the spring of 1847, he and Orra spent several weeks in Richmond, Virginia. Orra kept a detailed diary that shows her gifts as observer, and Edward sent five letters to the Amherst newspaper.²³⁸ They were disconcerted by encountering slavery at first and. Edward thought slavery was retarding Richmond's economy, but Orra and he nonetheless praised paternalistic slave owners. They attended black as well as white churches, and looked into schooling of young blacks. Edward described in detail the sweaty and pungent realities of slaves at work in a tobacco factory and a coal mine.

Three years later the Hitchcocks spent five months in Western Europe.²³⁹ As in 1847, this trip had been urged upon Edward by his colleagues at Amherst College, where he was in his sixth year as president; they hoped that travel would appease his hypochondria and pervasive despondency. It was the Hitchcocks' sole trip abroad and only their second extended vacation together away from home. Edward was commissioned by the state to report on advanced agricultural instruction in Europe (he was well known for advocating scientific agricultural education),²⁴⁰ so this dictated some of their itinerary although they mostly followed a classical tourist route. Edward met leading scientists in England with whom he had corresponded, including Daubeny, Lyell, Mantell, Murchison, Owen, and Sedgwick, and he and Orra visited many municipal museums and scientific institutions. (It's both curious and enlightening to compare today's museum installations with Edward's descriptions of displays in British and European institutions.) Edward also attended the meetings in Edinburgh of the British Association for the Advancement of Science, where he delivered two papers on ancient river terraces in the Connecticut River Valley. From late May to late September, the Hitchcocks journeyed through Ireland, Scotland, Germany, Switzerland, and France. In late summer, they attended the Third International Peace Congress in Frankfurt, Germany, where Edward served as a delegate from Massachusetts. (Since the mid-1830s he had sympathized with the New England antiwar cause, but wasn't a militant.)

Their love of landscape and geology led the Hitchcocks to major geological sites, including often adventurous climbs by foot and horse through the mountainous regions of northern Wales and Scotland, and the Swiss Alps. In the Alps, Edward visited the sites he had read about in Agassiz's famous study of glaciers that had so influenced him in 1841. Agassiz had initiated his theory of a massive prehistoric ice cap by studying his native mountains, and Edward was eager to test his own ideas about glacial movement. Only schematic notes survive

²³⁶ For Mary Lyon (1797-1849), see Hitchcock's biography, *The power of Christian benevolence illustrated in the life and labors of Mary Lyon* (Northampton MA, 1851).

²³⁷ Tyler 1873, pp. 28-29.

²³⁸ Herbert 2008. The account of the 1847 vacation in Virginia gives details of both Orra's and Edward's preoccupations. Edward's letters, dated from April 7 to April 29, were printed in the *Hampshire and Franklin Express* (copies in EOH, Box OS3).

²³⁹ Described by Orra in engaging detail in Herbert 2008 and by Edward in several business-like letters mailed to the *New York Observer*. For Edward's partial diary and notes on the tour, see *Hitchcock in Europe*.

²⁴⁰ See, for example, two lecture brochures, "Scientific agriculture, an address delivered before the Hampshire, Franklin, & Hampden Agricultural Society . . ." (Amherst 1827), and "The mutual dependence between agriculture and other pursuits, an address delivered before the Agricultural Societies of Hampshire and Hampden Counties in Massachusetts . . ." (Boston 1846).

about the Alps (the field notes he took have disappeared), but a year later he couched the spectacular Swiss views in the language of a romantic naturalist. He couldn't get enough of the high peaks "covered with snow and glaciers, and seeming too pure to belong to earth. Indeed, the whole scene seemed to me to be unearthly; the fittest emblem that my eyes ever rested upon of celestial scenes; and one cannot repress the desire, when looking upon it, to be borne away on wings over the glorious scene, and to repose for a time upon the gorgeous bed, forgetful of the lower world."²⁴¹ His ecstatic language contrasts with the more circumspect descriptions of the Alps by Silliman, who made his own tour a year later.²⁴² The contrast extends to their different modes of travel. Silliman and his entourage stayed in the best hotels, dined in well-reputed restaurants, and traveled in covered carriages, whereas the Hitchcocks took the least expensive choices, from rooms in boarding houses to moving about in the most ordinary public conveyances, sometimes in open carts.

Upon the Hitchcock's return to Amherst late in September, Edward began assembling his notes on European agricultural schools for a report to the state that he delivered in January 1851. It consisted of first-hand accounts of the curricula of a number of institutions in England, Ireland, Germany, and France, and summaries of dozens of others he learned about from their publications.²⁴³ He regretted everywhere the preferences given to upperclass students, but extolled the benefits of higher study in the science of agriculture that would bear fruit in democratic America. He also lectured widely on agricultural science, urging farmers to adopt its principles in order to compete "with the products of the West and South, poured in upon them through the great iron sluiceways that steam has forced open." A supporter of new rail lines in Massachusetts, Hitchcock added "The more railroads we have, the better; for they will only bring the market nearer. Instead of discouraging the farmer, they should stimulate him to seize upon and apply all the principles of science and experience to improve the cultivation of the soil."²⁴⁴

Hitchcock's science of agriculture didn't compete with his romantic view of his native region. It was only in later generations that science was thought to be in conflict with a poetic and emotional attachment to nature. Hitchcock had a Wordsworthian devotion to the hills and valleys of Western Massachusetts, and embraced it in his teaching. He took classes out to nearby hilltops, having the students clear pathways to their tops so as to provide untrammelled views. Local names like Hilliard's Knob or Snake Hill lacked resonance and needed terms whose historical and literary associations gave them poetic grace. From the mid 1840s onward he renamed several of them in elaborate ceremonies, including Mounts Pocumtuck, Norwottock, Castor, and Pollux. When naming Mount Nonotuck in 1856, he tossed into the air several small rocks from around the world so as to receive Nonotuck "into fellowship with all the other mountains."²⁴⁵

Anxious to rid himself of everything but teaching, publishing, lecturing and sermonizing, Hitchcock resigned the presidency of Amherst College in 1854 after nine years in office. Despite his complaints, he had been outstandingly productive from 1851 through 1854: eleven scientific articles (of which three in Silliman's journal), two religious books and three major published sermons plus several others. Released from the presidency, he was even more productive. From 1855 to 1863, he wrote thirteen scientific papers (of which four in Silliman's journal), four scientific books, and five major religious tracts. In one remarkable pair of years, 1857-1858, he published two significant books. Illustrations of surface geology appeared in 1857 in Washington as the ninth volume of the Smithsonian contributions to knowledge, and in 1858, he published in Boston his magnum opus on fossil impressions, *Ichnology of New England* (see below, "Fossil sandstone impressions"). Appointed in 1856 as state geologist of Vermont, Hitchcock published a pair of preliminary survey reports in 1857 and 1858.

In his last five years of life, Hitchcock was hardly less productive. Until 1861 he made annual revisions of *Elementary geology*, keeping his students abreast of European as well as American geology. He continued geological explorations in Massachusetts and Vermont, publishing several articles and in 1861, *Report of the Geology of Vermont*. He was the chief investigator and editor, aided by his sons Edward Jr. and Charles. He also remained active in the American Association for the Advancement of Science and published three geological papers in its *Proceedings* in 1861. Two years later appeared his last two articles, suitably divided between his religious and his geological audiences. "New facts and conclusions respecting the fossil footmarks of the

²⁴¹ Hitchcock 1851, pp. 192-93.

²⁴² Silliman, *A visit to Europe in 1851*. New York, 2 vols., 1853.

²⁴³ Edward Hitchcock et al. *Report of Commissioners concerning an agricultural school*. Commonwealth of Massachusetts, House – No. 13, January 1851. Except for a few paragraphs by other commissioners, Hitchcock was the sole author of the report. See also *Hitchcock in Europe* and detailed notes on the tour in EOH, box 19, folder 7.

²⁴⁴ Hitchcock, "Sciences Applicable to Farming, from an Address before the Hampshire Agricultural Society, Oct. 10, 1856," in *Abstract of returns of the Agricultural Societies of Massachusetts, 1856*, ed. Charles L. Flint (Boston 1857): 47-56.

²⁴⁵ Hitchcock 1863, *Reminiscences*, pp. 247-48. See Halttunen 2002, pp. 166-77, and Herbert 2010. In EOH, box 9, folder 9, there are undated notes on the procedure of naming mountains, and the symbolism of the ceremonies.

Connecticut Valley,” was in the American journal of science in November 1863, his last piece for Silliman, and that summer had appeared “The law of nature’s constancy subordinate to the higher law of change” marking the end of his many contributions to *Biblioteca sacra*. These two articles are not mere recapitulations of prior writings—the latter is a serious grappling with Darwin’s *Origins of species*—and they will be considered in the sections “Science and the Bible” and “Fossil sandstone impressions.”

His wife and partner Orra died in April that year aged sixty-seven. He memorialized her warmly in his autobiographical *Reminiscences* that came out the following September. By then his illnesses had made him a hundred-pound wraith, but he attended the first meeting of the newly founded American Academy of Sciences. (He was one of its fifty charter members, as was Silliman.) He continued to refine his ideas on fossil footmarks, preparing a supplement to his 1858 *Ichnology of New England* that he presented in draft form to the meeting of the AAAS in 1862. It was published posthumously by his son Charles in 1865.²⁴⁶ When Hitchcock died in February 1864, three months shy of his seventy-first birthday, he was no longer in the forefront of science but he left behind abundant evidence of one of the most productive scientific careers in the middle third of the century. Nine months later his mentor and friend Silliman died at age eighty-five.

Science and the Bible, 1842-1863

Hitchcock’s crusade to reconcile modern geology with religion, begun in the early 1820s, continued and expanded after 1841. His views about science and religion have been studied in superb articles by Stanley M. Guralnick and Conrad Wright.²⁴⁷ Wright takes Hitchcock’s *Religion of geology* (1851) as the sole text for his discussion of the Amherst man’s views, and he includes insightful summaries of Silliman’s parallel conceptions. Guralnick focuses more closely on several of Hitchcock’s publications, and comments with more subtlety than Wright on his refusal to accept Darwinism. What I write in following paragraphs here does not dispute any of the two authors’ findings—indeed, I build upon them—but I shall add comments on the contexts of Hitchcock’s several publications, especially on the role he gave sublime landscape.

The views of the Mosaic controversy by Silliman and Hitchcock were very close, with differences that are minor but telling for the younger man’s outlook. Silliman regularly summarized his natural theology in his lectures and books, and seemed at ease in joining science and religion under the shelter of intelligent design. He had nothing of Hitchcock’s anguish over the need to reconcile the two, and was slower to align contemporary geology with biblical interpretation. Unlike Silliman, Hitchcock kept science and religion in separate realms when he addressed the scientific community. Major works like his *Final report* were free of religion except for perfunctory mentions of the deity, the exception being his *Elementary geology* in whose every edition he summarized natural theology because the book was aimed at students. Unlike his Yale mentor, he was an active theologian who poured out a steady volume of sermons and articles in which he argued that geology wasn’t in competition with religion. He worried that practitioners of science, because they too seldom declared their faith, could appear to be irreligious. His private journals reveal his worries that his own passion for science threatened his religion. The two were at odds in his innermost being, yet he didn’t want to reveal this, so he was at great pains to bring the two together in the public eye.

In 1839, Silliman once again wrote that one shouldn’t teach geology from the pulpit, because it would go over the heads of parishioners and interfere with their faith.²⁴⁸ Of course Hitchcock couldn’t agree. As professor and minister, he taught geology from his pulpit because modern science added to the power of Christian belief. He introduced the latest geology into his college sermons and religious tracts, putting it at the very center of his preaching. Far more extensively than Silliman, when writing of religion he entered into details about the stratification of rocks, inorganic and organic fossils, the processes that formed them, the earth’s internal heat, and the succession of geological ages. Religious men must learn science in order to refute the false conviction that it’s atheistic, so whole sections of his religious texts read like expositions of the latest geological disclosures. He deployed the scientific study of nature’s workings to reason about religion, not the reverse. In his inaugural address as president of Amherst College, Hitchcock said that gifted scientists like Herschel, Sedgwick, Owen and others he admired didn’t impose faith on nature but, using Bacon’s inductive principle, they “derive the principles of science from facts in nature [which] carries them irresistibly backward to a First Cause.”²⁴⁹ In other words,

²⁴⁶ Hitchcock 1865.

²⁴⁷ Guralnick 1972, and Wright, “The religion of geology,” *New England Quarterly* 14 (1941): 335-58.

²⁴⁸ In his introduction to Bakewell 1839. See above, “The Mosaic controversy.”

²⁴⁹ Hitchcock 1845, pp. 21-22.

science is the study of god-given laws of nature that reveal Divinity's "first causes." Deduction from the objective study of nature is for Hitchcock a rational process that belied the opinions of literal interpreters of the Bible who feared Baconian reasoning (and who steadily attacked Hitchcock, alarmed by his evocation of Bacon).

In his inaugural address in 1845, Hitchcock spoke as both secular and religious educator. Both fields came together in his natural theology, for which he deployed minute scientific reasoning while also giving a wide-ranging account of his philosophy. He paid attention to poetry, "the natural handmaiden of pure religion," and cited verses from Milton, Pope, and the fourteenth century Persian Hafiz. At the same time, he spoke occasionally like a strict Protestant minister. He felt compelled to warn his collegiate audience against poetry and fiction that exalted immorality and supplanted nature; equally reprehensible were transcendentalism and German philosophy. Nonetheless, his students and colleagues were aware of his own romantic naturalism and that he defended phrenology and mesmerism. In his address, he justified both because they dealt with things of the mind and didn't lead to materialism. Mesmerism offered the Christian "most interesting glimpses of the mode in which the mind may act when freed from flesh and blood, and clothed with a spiritual body."²⁵⁰

Aided no doubt by his prestige as president, Hitchcock was frequently invited to give lectures on religion to learned societies, religious groups, and once to the state legislature.²⁵¹ In 1851 he published *Religion of geology*, a loose gathering of sermons and lectures given over the preceding several years, "though additions and alterations have been made, from time to time, to adapt them to the progress of science." (p. v). Guralnick points out that even when discussing divine miracles, Hitchcock deploys his conviction in the rational operation of laws, for he posits that God followed His own law of miracles, although this law can never be known.²⁵² He repeatedly describes the state of current sciences, particularly geology, to show that they're compatible with religion. Fossil-bearing rocks reveal natural, not miraculous causes, and prove a vast extent of time before biblical Genesis. Breaking with orthodox Calvinism in another way, he writes that the occurrence of death long before the existence of man, proven by fossils, argues with the scriptural account of death as a consequence of man's sin. His break with Calvinism wasn't wide, however, because he believed that God made a world of frequent catastrophic upheavals. "It was benevolence on the part of God to allow evil to abound in a world which was to be the residence of a sinful creature; for the discipline of such a state was the only chance of his being rescued from the power of sin, and restored to the divine favor."²⁵³

Catastrophes like volcanic eruptions and earthquakes upheaved the earth but these were features of "divine benevolence" because they exposed valuable layers of coal and minerals that would otherwise have remained hidden. Who could doubt "that it was the hand of benevolence that drove the ploughshare of ruin through the earth's crust, and ridged up its surface into a thousand fantastic forms? It will more deeply impress us with the benevolence to remember that most of the sublime and the beautiful in the scenery of a country depends upon this disturbing agency. Beautiful as vegetable nature is, how tame is a landscape where only a dead level is covered with it, and no swelling hills, or jutting rocks, or murmuring waters, relieve the monotonous scene! And how does the interest increase with the wildness and ruggedness of the surface, and reach its maximum only where the disturbance and dislocation have been most violent!" (pp. 182-83).

These words show us how Hitchcock's religion and his geology made him a romantic naturalist for whom the sublime in nature was God's great gift. God so adorned earth "to gratify a taste for fine scenery." (p. 183). Scenery was so central to Hitchcock that his expiations on its beneficial effects distinguish him from all contemporary American geologists. He is the only author of a state geology to grant "scenery" a major sub-section (one-fourth of the whole). Silliman, it's true, was sensitive to natural beauty in his travel writings, but he favored the pastoral and only occasionally invoked the sublime, limiting its expression to high mountains in northern New England, Scotland, and the Alps. Hitchcock instead treated the hilltops around Amherst as veritable mountains, and renamed them in ceremonies that resounded with the sublime. Thrown up by the "ploughshare of ruin," these hills of western Massachusetts embodied religion and geology in equal proportions. Yes, his absorption by landscape had a powerful precedent in Humboldt's life and work, but the Prussian genius treated nature as all sufficient, without the need to appeal to religion. Matched against him, the Amherst professor was a parochial

²⁵⁰ Hitchcock 1845, p. 28.

²⁵¹ Hitchcock, *The inseparable trio: a sermon delivered before his excellency George N. Briggs, governor . . . and the legislature of Massachusetts, at the annual election, Wednesday, January 2d, 1850* (Boston 1850).

²⁵² Guralnick 1972, pp. 535-37.

²⁵³ It's from this Calvinist viewpoint that Hitchcock offered Silliman some doubtful consolation upon the death of his wife: "After all, in such calamities, I also feel that the afflicted need special support from Divine Grace, such support as nothing but fervent prayer will bring. And my sincere desire is that such grace may be given you in rich abundance, so that you may be able to say, *it is good for me that I have been afflicted.*" (1.20.50).

New England Protestant. He was, to his credit, an observational geologist who drew many of his lessons from the rocks and land forms of his native territory which he studied with a passion he couldn't extract from those reproduced in European publications.

When Hitchcock went to Europe in 1850, he finally saw the heights of Wales, Scotland, and the Alps which had sponsored the expressions of sublimity that had resonated with him in New England. In *Religion of geology*, he wrote thirteen consecutive pages steeped in the romantic sublime (pp. 183-97). He described the summit of Mount Snowdon, the Welsh site favored by British Romantic painters, as “shooting up in ragged peaks and edges, as if they formed the teeth of mother earth; although, in fact, it was the tooth of time that has gnawed them into their present forms.” (p. 187). From the heights of Mount Rigi in the Alps, he felt close to God. “Indeed, the whole scene seemed to me to be unearthly; the fittest emblem that my eyes every rested upon of celestial scenes; and one cannot repress the desire, when looking upon it, to be borne away on wings over the glorious scene, and to repose for a time upon the gorgeous bed, forgetful of the lower world.”²⁵⁴

Over the course of the 1850s Hitchcock continued to lecture and publish on natural theology, frequently evoking the sublime. In 1855 he gave dozens of lectures, often in a suite of four on successive days, on “Bearings of geology upon religion” to the YMCA in Buffalo, Cleveland, Columbus, Indianapolis, and to literary associations in Chicago and Milwaukee.²⁵⁵ Later that year he repeated these lectures in St. Louis where he met Silliman who had been lecturing there.²⁵⁶ Guralnick has shown that over the course of the decade, Hitchcock gradually gave up the idea that scientific truth was directly parallel to the truths of revelation; he set geological studies on an even more independent track than heretofore. In 1857, for example, he summarized his views of the geology of New England in a major pamphlet, without a single mention of god or religion.²⁵⁷ Then, in 1859, in the second edition of *Religion of geology*, he relinquished his longstanding belief that the six days of Genesis paralleled the great geological ages. He introduced a veritable mea culpa: “If one can only be satisfied with general principles . . . without attempting to find something in Scriptures corresponding to all the details of science, or something in nature corresponding to every particular in revelation, we shall find harmony and mutual corroboration where an unwise and unauthorized attempt to extend the parallelism to details might leave us in doubt and perplexity.”²⁵⁸ This change means that Hitchcock now joined a large number of theological and secular writers who could navigate freely in both science and biblical belief without need to treat them as substantially intertwined. Even so, geology was essential to religion because by sifting natural laws it dealt with the evidence of divine benevolence and intelligent design.

In 1863, a year before his death, Hitchcock's very frail body still supported a vigorous mind. In a long article he repeated his Calvinist belief in human depravity and divine redemption, and stated his opposition to Darwinian evolution.²⁵⁹ He had been against pre-Darwinian evolution because there was no evidence of fossils linking the great extinctions, and therefore these were miraculous acts of God (benevolent! as we've seen). He opposed Darwin for the same reason which means, as Guralnick points out, that “that his skepticism grew from scientific rather than religious grounds.”²⁶⁰ The tone of his rejection of Darwin is skeptical, well-reasoned, not dogmatic. It need hardly be said that few scientists gave immediate acceptance to Darwin. Owen was publicly in opposition because he was unwilling to give up divine intervention, and Agassiz, one of Hitchcock's heroes, was even more outspokenly against Darwin. He didn't take Hitchcock's careful steps to refute him. Despite his Calvinism, Hitchcock stands, Guralnick writes, “as an interesting example of the highest level of intellectual development possible for the skeptical scientist of the pre-Darwinian age. . . . Anti-Darwinians in 1860, therefore, ought not to be dismissed as simple-minded fundamentalists or religious apologists, for those scientists—Hitchcock among them—had left no room in their debates over the previous decades for the arbitration of scientific theory by faith alone.”²⁶¹

Rocky strata and drifting boulders, 1842-1863

²⁵⁴ See Herbert 2012, chs. 1 and 6.

²⁵⁵ For this lecture tour, see EOH, box OS-3, folder 6.

²⁵⁶ See letters exchanged between the two that fall, especially Hitchcock to Silliman, 11.23.55. Guralnick 1972, p. 540, mistakenly dates Silliman's St. Louis lectures to 1853.

²⁵⁷ Hitchcock 1857.

²⁵⁸ Hitchcock 1851, ed. 1859, p. 526, Cited by Guralnick 1872, p. 541.

²⁵⁹ Hitchcock, “The law of nature's constancy subordinate to the higher law of change,” *Biblioteca sacra* 20, 79 (July 1863): 489-561.

²⁶⁰ Guralnick 1972, p. 542.

²⁶¹ Guralnick 1892, pp. 542-23.

Religion loomed large in Hitchcock's life, but when he faced the scientific community, he appeared as a prominent American geologist by dint of his publications, his lectures, and his participation in secular meetings of learned societies. From 1842 to 1861, he read twenty-three papers before the Association of American Geologists and Naturalists, the American Association for the Advancement of Science, and the Boston Society of Natural History, and in 1850, two papers at the meetings in Edinburgh of the British Association for the Advancement of Science. All of these were published, and several were reprinted in the American journal of science. They are among his twenty-five articles that appeared in Silliman's journal after 1841. In addition to all these papers and articles he published three geological books, re-edited *Elementary geology* nearly every year, and was editor and chief investigator for the survey of the geology of Vermont from 1856 to 1861 (see below). Over the same span of time Silliman's lectures and editing gave him more prominence than his Amherst colleague but, as I've mentioned, he had ceased geological researches. As for Hitchcock, his role as initiator of ichnology is regularly credited, so he has a distinct place in the history of paleontology. However, his other geological work has been demoted to a stratum that is only occasionally probed by writers. In following paragraphs I'll point to his work in geology, including glacial "drift," and then treat paleontology in a separate section, "Fossil sandstone impressions, 1844-1863"

Hitchcock was far and away the leading geologist in the state of Massachusetts. Notable are his succession of maps of the state which punctuate his whole career. To those he had published in 1823, 1833, and 1841, he added one in 1844, commissioned by the state, that deserves special notice.²⁶² Engraved and colored by hand, it was laid down on twenty-four sections of canvas on a scale of five miles to the inch. The map responded to calls from the state to report on geological resources, including minerals, stones and other assets of value: the pragmatic pursuit of "economic geology." An enthusiast for railway construction, he was asked in 1853 to report to the state legislature on the geology of Hoosac Mountain when a rail proposal was being considered.²⁶³ In the same year, he issued a report on several geological findings that included large hints that the government should subsidize explorations of potential coal fields in the Berkshires and in Bristol County.²⁶⁴ Meanwhile, in the wake of his commissioned study of agricultural instruction in Europe (see above) delivered to the legislature in January 1851, he was named to the state Board of Agriculture and took part in the campaign that ultimately led to the founding of the Massachusetts Agricultural College.

Through the last two decades of his life, Hitchcock continued to explore New England minerals and rocks. Although he didn't undertake deep geological soundings, he excelled in spotting unusual substances and formations. In Silliman's journal in 1844 he reported on the discovery of copper and on the fluoride yttracrite in western Massachusetts,²⁶⁵ and he was apparently the first to look into magnetic polarity in New England basalt.²⁶⁶ In 1847 he speculated convincingly on the role of uplifted basalt in determining the strata of sandstone, and made the prescient suggestion that lateral movements of the basalt ridges accounted for some of the shifted strata.²⁶⁷ However, he was still far from a thorough understanding of sedimentation, for he wondered if the slightly dipped strata could have resulted from upheaval or else had been deposited on an incline. Before long, the impossibility of the latter became apparent. He persevered with his examination of the lower and upper banks of the Connecticut river, from which he had earlier deduced the great prehistoric lake posthumously named "Lake Hitchcock." From 1849 to 1851 he gave four overlapping papers to learned societies that described the beaches

²⁶² Hitchcock, *Topographical map of Massachusetts compiled from astronomical, trigonometrical and various local surveys, made by the order of the legislature . . .* (Boston 1844). Engraved by George G. Smith, Boston.

²⁶³ Hitchcock, *The Hoosac tunnel, a brief report of the hearing of the Troy and Greenfield Railroad Company, petitioners for a loan of two millions, before a joint special committee of the legislature of Massachusetts* (Boston 1853). Hitchcock took gratuitous pleasure in pointing out that scattered granite boulders atop the mountain had originated in Vermont's Saddle Mountain range.

²⁶⁴ Hitchcock, "Report on certain points in the geology of Massachusetts," *Commonwealth of Massachusetts, House Document* no. 39 (March 1853). This was his first report following his commission in 1852 to study the state's surface geology.

²⁶⁵ Hitchcock, "Discovery of more native copper in the town of Whately in Massachusetts, in the valley of Connecticut River, with remarks upon its origin," *AJS* 47, 2 (Oct. 1844): 322-23, and "Discovery of the yttracrite in Massachusetts," *ibid.*: 351-53. He had presented both findings the previous year to the AAGN.

²⁶⁶ Hitchcock, "Remarkable facts respecting the magnetic polarity of trap rocks in New England," *Proceedings of the Association of American Geologists and Naturalists*, 1845: 32.

²⁶⁷ Hitchcock, "On the trap tuff, or volcanic grit of the Connecticut valley, with the bearings of its history upon the age of the trap rock and sandstone generally in that valley," *AJS* 2d series 4, 11 (Sept. 1847): 199-207. See Merrill 1924, p. 244 and *passim*.

and terraces formed by the river/lake over time.²⁶⁸ Two decades later, American geologists proved that these terraces instead represented successive stages of erosion,²⁶⁹ but Hitchcock's descriptions of these moraines and levels entered importantly into geologists' study of the effects of shifting riverbeds and seas.

"Drift," the boulders and gravels moved by glacial action, was one of Hitchcock's lifelong preoccupations. In his Final report of 1841 he had adapted Agassiz's *Etudes sur les glaciers* to his own study of linear streams of boulders in Massachusetts but, like most geologists then, he couldn't accept the idea of a massive ice cap over Canada and the northern United States. The fact that he repeatedly traced drift that moved from north to south makes the modern reader cry out for Agassiz's explanation, but Hitchcock resisted it. He conceived instead of localized glaciers, icebergs, and water as the forces that pushed rocks far from their original sites: his "glacio-aqueous" theory. He puzzled over the implications of miles of boulders carried southeasterly from Canaan, New York, across the Berkshires, right over its highest peaks.²⁷⁰ This excluded water and floating icebergs as agencies but, unable to conceive of Agassiz's solution, he frankly admitted that the explanation awaited future work. Other geologists were exploring water and ice as the engines of drift, but with rather different ideas about rising or falling levels of land and sea. Some, like the brothers H. D. and W. B. Rogers, refused to consider ice at all as an active force in forming drift.²⁷¹

Hitchcock was sufficiently sharp-eyed to speculate on the dynamic actions of moving rocks. In several articles and reports he described parallel grooves on rocks that he attributed to glacial scouring, as well as striations in two different directions on the same rock, therefore involving separate glacial actions. He repeated this observation in 1856 in *Illustrations of surface geology*, deducing that there must have been two separate periods of glacial action. Merrill wrote that he believed this to be "the first suggestion . . . of a possible recurrence of glacial periods," and therefore a deduction of great significance.²⁷² Nonetheless, in his 1856 book Hitchcock denied the possibility of Agassiz's enormous thickness of ice because he could only imagine the movements of separate glaciers. Further, he still had something of the Neptunist in him, for he wrongly thought that some rocky striations were caused by materials embedded in icebergs that floated along on the ancient seas that flooded the land. Icebergs could also drop boulders as they moved along, so here was an explanation, he believed, for some of the trains of rocks that would otherwise be attributed to glacial deposits. He also credited rushing waters for moving boulders.

Hitchcock repeated these flawed explanations of drift in his survey of Vermont's geology that appeared in 1861. Today this seems retardataire but hardly any American geologists could then envision ice more than 2,000 feet thick rising over New England's highest peaks. Despite this, Hitchcock's exacting details of the types and locations of the stony evidence of drift are a valuable compendium of topographical value. From his Vermont survey, Hitchcock extracted for Silliman's journal one particularly important feature.²⁷³ He and his son Charles had found more evidence of metamorphic alterations of pebbles that he had adduced in his Massachusetts surveys in 1833 and 1841. Metamorphism was a comparatively new subfield made prominent by Lyell in the early 1830s. Hitchcock and his son reexamined flattened and distorted pebbles in conglomerate rock near Newport, RI, and found many more along the western slopes of the Green Mountains. Hitchcock concluded that metamorphism had changed quartz into schists and gneisses. He was ahead of most of his contemporaries, including Charles T. Jackson and William B. Rogers, who disputed his metamorphism. Some of his explanations for this metamorphism are no longer accepted, but Merrill regarded Hitchcock's work as a major step comparable then to the latest work in Europe.²⁷⁴

Hitchcock's controversy with James Deane, 1842-1845

²⁶⁸ Hitchcock, "On the river terraces of the Connecticut valley, and on the erosions of the earth's surface," *Proceedings of the American Association for the Advancement of Science, second meeting*, 1849; "On terraces and ancient sea beaches, especially those on the Connecticut River, and its tributaries in New England," and "On the erosions of the earth's surface, especially by rivers," *Report of the twentieth meeting of the British Association for the Advancement of Science, 1850*, and "On the terrace and sea beaches that have been formed since the drift period, especially those along the Connecticut River," *Proceedings of the American Association for the Advancement of Science, sixth meeting*, 1851.

²⁶⁹ Merrill 1924, p. 547.

²⁷⁰ Hitchcock, "Description of a singular case of the dispersion of blocks of stone connected with drift, in Berkshire County, Massachusetts," *AJS* 49, 2 (Oct. 1845): 258-65.

²⁷¹ See Merrill 1924, pp. 623-34.

²⁷² Merrill 1924, p. 639.

²⁷³ Hitchcock, "On the conversion of certain conglomerates into talcose and micaceous schists and gneiss, by the elongation, flattening and metamorphosis of the pebbles and the cement," *AJS* ns 31, 91 (May 1861): 372-92.

²⁷⁴ Merrill 1924, p. 403.

From 1842 through 1845, Hitchcock suffered the worst trauma of his professional life, a public controversy with Dr. James Deane of Greenfield over which was the “discoverer” of the fossil footmarks in Connecticut River valley sandstone. The dispute ended when Hitchcock reluctantly conceded the title of “discoverer” to Deane and accepted the role of leading interpreter for himself. Seven letters from Silliman to Hitchcock and one reply from Hitchcock (several of his letters are missing),²⁷⁵ show just how deeply this dispute wracked the Amherst man. To these letters should be added several from Deane to Hitchcock,²⁷⁶ and eleven articles involving the controversy from 1843 through 1845 by Hitchcock, Silliman, or Deane (mostly in Silliman’s journal). Rivalry and conflicting claims of priority were common in this era, including the one that pitted Henry De la Beche against Roderick Murchison over the identification and naming of Devonian strata. That argument of the 1830s was of prime importance, whereas the Hitchcock-Deane dispute was significant only to its participants, and wouldn’t deserve much consideration were it not so central to the Hitchcock-Silliman correspondence. Their letters are worth reading in sequence to sense the depth of Hitchcock’s despair as well as to examine Silliman’s extraordinary efforts of placate him while also defending his own role in the dispute.

This rivalry began in July 1835, when Deane sent Silliman a cast of some footmarks and a description of them. Notified of this by Silliman, Hitchcock begged him to publish his article on the tracks before Deane’s, promising to give credit to the Greenfield doctor.²⁷⁷ In his article in 1836, and again in his Final report of 1841, Hitchcock wrote that Deane had first called his attention to the marks, but he didn’t mention that Deane had identified them as tracks of a bird, “probably of the Turkey species.” (Silliman didn’t publish the paper Deane had volunteered.) By 1842 Deane was determined to assert his priority as discoverer of the tracks. He notified both Hitchcock and Silliman of his discoveries of new tracks which he attributed to birds. Silliman, probably feeling guilty for putting Deane aside in 1835, gave him prominence in his address at the Boston meeting of the American Geologists and Naturalists in April 1842, by referring to “the trifold tracks and impressions on the new red sandstone of the valley of the Connecticut, so zealously explored by Dr. James Dean [sic] of Greenfield, and both explored and figured and described by Prof. Hitchcock, leave no reasonable doubt, that they are, at least in part, due to the feet of birds, some of them of colossal dimensions.”

To Hitchcock, this remark gave priority to Deane, and so did an article Silliman published the next year.²⁷⁸ It disclosed that in the fall of 1842, Silliman sent to Gideon Mantell in London a box of sample tracks that Deane provided, accompanied by Deane’s letter dated September 20, 1842. In his article, Silliman reproduced Deane’s letter, the reply from Mantell (February 13, 1843), and remarks by Richard Owen, Roderick Murchison, and Charles Lyell. Deane’s letter described the accompanying specimens in objective terms without speculating on their age or relation to geological strata. He pointed to one large specimen of Hitchcock’s *Ornithoidichnites tuberosus* that was more perfect than any that the Amherst professor had illustrated. In their statements, Mantell, Owen, Murchison, and Lyell agreed that the stony impressions were those of birds.²⁷⁹ Owen’s recent identification of the giant extinct moa (“*Dinornis*”) helped overcome the British men’s reluctance to accept Hitchcock’s reasoning in the absence of avian bones among the footmarks. In his introduction to these documents, Silliman cited “Dr. James Deane, the original observer of the *Ornithichnites*, (so well and boldly described by Prof. Hitchcock).” In following pages, Mantell and Owen named Deane as the “original discoverer” and “first observer,” and Hitchcock “the successful investigator.”

The controversy with Deane was therefore provoked by the arrival in London of Deane’s specimens. Already in 1836 the London Geological Society had received samples from Hitchcock. They were then seen by many, including Adolf Brongniart and William Buckland. Buckland immediately endorsed Hitchcock’s findings, but Brongniart, Mantell and the other geologists were skeptical because they needed fossil bones of the track makers to be convinced that they were made by birds. Deane’s specimens of 1842 were more crisp and detailed than those that Hitchcock had earlier sent to London, and Owen’s recent identification of the *Dinornis* (the extinct Moa), proved the existence of colossal extinct birds that gave credence to the American tracks. By 1843 the British geologists finally came round to Hitchcock’s view, but he was dismayed to learn that it was Deane’s specimens which brought conviction, not his.

²⁷⁵ Silliman to Hitchcock: 9.13.43, 10.30.43, 8.2.44, 9.12.44, 9.19.44, 11.1.44, and 12.9.44; Hitchcock reply: 9.16.43.

²⁷⁶ In EOH, box 3, folder 9, letters from 3.20.42 to 9.10.46.

²⁷⁷ Letters exchanged in July 1835, leading to the publication of Hitchcock 1836.

²⁷⁸ Silliman, “*Ornithichnites of the Connecticut River Sandstones and the *Dinornis* of New Zealand*,” *AJS* 45, 1 (Oct. 1843): pp. 177-88.

²⁷⁹ Lyell examined the Massachusetts footmarks in situ, while visiting Hitchcock in April, 1842. See Charles Lyell. *Travels in North America in the years 1841-42* (New York, 2 vols., 1845), vol. 1, pp. 200-01.

To minimize Deane's role, Hitchcock undertook a campaign to assert his own claim as the foremost specialist on the Connecticut valley footmarks. That fall he wrote Lyell to that effect, saying that Deane had first brought his attention to the marks but wasn't a geologist and therefore couldn't treat them in depth.²⁸⁰ On his part, Silliman went to great pains to bring Deane and Hitchcock together, and initiated a trip with them to Greenfield and the river valley quarries in September 1843. Hitchcock wasn't mollified, and opened out a dispute with the Yale scientist that threatened a permanent rupture. He proposed to Silliman an article giving his side of the controversy, but Silliman urged its postponement and regretted Hitchcock's stance (9.13.43). In May 1844, in a paper given at the annual meeting of the Association of American Geologists and Naturalists, Hitchcock went over the controversy in great detail.²⁸¹ He showed just how disturbed he was by citing the exact pages in Silliman's article that listed Deane as the first or original discoverer. In his view, his erstwhile mentor was among those who gave the erroneous impression that Deane had preceded him in the investigation of the tracks' significance. He was too absorbed by his troubles to recognize that Silliman was being extremely patient with him, remarkably so because he must have been exasperated by Hitchcock's tender nerves. In several letters Silliman apologized for lending himself in any way to Hitchcock's perception that he had been demoted, and he repeatedly said that he placed Deane first only in a chronological sense, as the person who originally called attention to the tracks. He nonetheless was willing to criticize Hitchcock who, he wrote, depressed Deane "lower than an active & intelligent observer ought to be placed" in his May address (8.10.44). He reminded Hitchcock that in 1835 he had promised to give full credit to Deane.

In his May address, Hitchcock pointed out that from 1835 onward, he had worked alone on the footmarks, identifying and classifying them. Deane had only described them without reference to geological age and besides, he wasn't the first to point them out because already in 1802, Pliny Moody of South Hadley had turned up a huge stone of "turkey tracks;" further, in 1835, W. W. Draper and William Wilson of Greenfield had shown tracks to Deane, who therefore wasn't literally the first to notice them. "If to prove by long and laborious investigations, what is the true nature of these impressions, may properly be regarded as their discovery, in the sense in which that term is understood by scientific men, then I may lay claim to it . . . In a popular sense, indeed, he who first finds a specimen in natural history, may be called the original discoverer; and in this sense I have always spoken of Dr. Deane, Mr. Moody, and Mr. Wilson, as original discoverers." Much higher credit, he added, was due to Dr. Deane, who drew them to the attention "of those whose professional business it was to examine such objects, and even took casts of them." Here it should be said that Deane was guilty of the same lack of generosity he attributed to Hitchcock, for he secured many of his tracks from Dexter Marsh, a Greenfield farmer, carpenter and jack-of-all-trades who was then amassing a huge collection of the fossil tracks. Marsh quarried these himself, analyzed them with astuteness, and sold many to Deane, Hitchcock, and others. By 1848 his own collection was widely known and visited, and rivaled Amherst's in quantity and quality. Hitchcock, who had frequently consulted Marsh, was one of the principal purchasers when Marsh's collection was auctioned in 1853 after his death.²⁸²

The whole controversy gained public notice in the pages of the American journal of science in October 1844.²⁸³ Silliman encouraged both men to state their claims. They did so, with steely politeness. In the wake of this dialogue, it became common to designate Deane as the "first" or "original" discoverer, and Hitchcock as the prime interpreter and the founder of the new science of ichnolithology. Even so, the Amherst professor wasn't

²⁸⁰ Hitchcock to Lyell, Dec. 17, 1843 (Edinburgh University Library, Special Collections). "I am much obliged to you, Mr. Owen, & Mr. Murchison for your compliment to my moral courage in respect to the tracks. I can only say that the phrenologists have always given me a large organ of obstinacy (I forget their name [sic]) & probably this had quite as much to do with the course I took as moral courage."

²⁸¹ Hitchcock, "Report on ichnolithology, or fossil footmarks, with a description of several new species, and the coprolites of birds, from the valley of Connecticut River, and of a supposed footmark from the valley of Hudson River," *AJS* 47, 2 (Oct. 1844): 292-322. ("Read before the Association of American Geologists and Naturalists, at Washington, May 11, 1844"). He cites pages 179 and 185 in Silliman's "Ornithichnites."

²⁸² For Marsh, who deserves separate study, see his article in Silliman's journal, "Fossil footprints," *AJS* ns 6 (November 1848): 272-74. See also the various witness accounts and letters concerning Marsh edited by his son George E. Marsh in *Proceedings of the Pocumtuck Valley Memorial Association*, vol. 5, 1912 [from the Annual Meeting of 1908]: 258-84. See also Hitchcock 1863, *Reminiscences*, pp. 81-84. Sarah Doyle posted online an excellent short biography "Dexter Marsh," on the website "Jurassic Roadshow," on July 15, 2011. After Marsh's death in 1853, it was Roswell Field of Greenfield who became Hitchcock's chief supplier of sandstone prints.

²⁸³ "On the discovery of fossil footmarks; by James Deane, M.D.," *AJS* 47, 2 (Oct. 1844): 381-90; "Rejoinder to the preceding article of Dr. Deane; by Prof. Edward Hitchcock," *Ibid.*: 390-99 (signed Sept. 16, 1844); "Answer to the 'Rejoinder' of Prof. Hitchcock; by James Deane, M.D.," *Ibid.*: 399-401 (signed Sept. 24, 1844).

mollified, for he suffered another blow that autumn. Shortly after the confrontation in the AJS, he learned of Gideon Mantell's new book, *The medals of creation*. Mantell was convinced by Deane's specimens and letter that the tracks were made by birds. He gave pride of place to Deane, quoting extensively from his letter and reproducing one of Deane's drawings. He also praised "Professor G. Hitchcock," for his "splendid work," but Deane loomed far larger in his account. Mantell had been one of Hitchcock's heroes, so this perceived slight was deeply unnerving. Aware of Hitchcock's pain, Silliman told him to send a reclamation to Mantell and to comment also on a note Silliman would include in his forthcoming review of Mantell's book.²⁸⁴ His note did justice to both men, placing Deane's discovery first in chronological order, and praising Hitchcock for "establishing the philosophy of this subject." Moreover, he told his aggrieved colleague (12.19.44), he had written Mantell to correct his "erroneous" views in the second edition of his book.

It's not hard to see why Hitchcock felt so deeply wounded by Deane's rise to prominence. "I find that just as I was lifting the cup of success to my life, wormwood & gall have been infused into it, not by enemies but by professed friends and that too in a case where I did not suppose such a result possible."²⁸⁵ For, much as he had gained prominence in his reports on the geology of Massachusetts, he hadn't made original geological discoveries. His disclosure of the stony footmarks in 1836, and his expansion upon this revelation in his Final report, gave him international distinction. He joined the small but growing number of those who were founding the new field of paleontology, and he alone established the sub-field of ichnolithology. His classifications of the species of footmarks were used by others, and his name was permanently attached to many of them. Nonetheless, he could no longer stand alone on the pedestal of discovery. Deane continued to publish newly uncovered footmarks (most passed on to him by his neighbor Dexter Marsh), but he limited himself to factual descriptions of the impressions and speculations on the animals that made them; he regularly used Hitchcock's nomenclature.²⁸⁶ Hitchcock reluctantly made peace with him, but never overcame his feeling of being unjustly served by the controversy. In 1858 he still felt the wounds because he summarized the whole affair in his magnum opus on footmarks, *Ichnology of New England*.

Fossil sandstone impressions, 1844-1863

Although several British scientists agreed that Hitchcock's tracks were made by birds, they did so reluctantly, and many couldn't endorse his claim because no bones had been found. Darwin wrote Hitchcock to praise him for his work, but withheld full endorsement for this reason.²⁸⁷ Hitchcock himself was cautious in his deductions. In his Final report, he attributed some tracks to Ornithoidichnites, resembling those of birds, and others to Sauroidichnites, resembling those of lizards. In "Report on ichnolithology" in 1844, he added more species and revised his former lists to include a total of twenty-one bird-like tracks and eleven saurians ("dinosaur" was coined by Owen in 1842). Four years later, constantly borrowing or acquiring new tracks, he summarized his findings (Hitchcock 1848), dividing the trackmakers into forty-nine species, twelve described as quadrupeds (lizards, tortoises, frogs or toads), and thirty-two as bipeds, of which twenty-two were birds. In addition to meticulous descriptions of the impressions (often requiring several paragraphs for one track), he provided illustrations made by placing sheets of mica over the impressions and then tracing them on paper. He keyed his plates to measurements and ratios (width of toes to length of foot), number and positions of phalanges and toe bones, the length of stride, and exact location where the track was found. By then he was able to distinguish tracks of young from mature species and to separate superimposed impressions made at different times.

Having identified many impressions made by animals other than birds (he frequently published newly found sandstone tracks), Hitchcock was increasingly under pressure to question his ascriptions to birds, because no corroborating bones had yet been unearthed. In 1855 he identified a new track of "an enormous biped with a

²⁸⁴ Silliman to Hitchcock, 12.9.44 and 12.19.44. Silliman's review of Mantell 1844, with his long footnote on the controversy, appeared in the AJS 48, 1 (April 1845): 105-36.

²⁸⁵ To Silliman, 9.16.44. In his reply three days later, the long-suffering Silliman reproached him for being listed among "professed friends" whereas he had always been Hitchcock's stalwart defender.

²⁸⁶ Silliman published several articles by Deane on the footmarks, in addition to the two in the tripartite dialogue with Hitchcock (AJS 47, 2 (Oct. 1844). See issues of vol. 46, 1 (April 1844); 48, 1 (April 1845); 49, 1 (Oct. 1845); ns 3, 7 (May 1847), and ns 5, 13 (May 1848).

²⁸⁷ Darwin to Hitchcock, Nov. 5, 1845 (EOH, box 3, folder 8). "In my opinion these footsteps (with which subject your name is certain to go down to long future posterity) make one of the most curious discoveries of the present century. . . . How sincerely I wish that you may live to discover some of the bones belonging to these gigantic birds"

very long tail” which wasn’t a bird.²⁸⁸ His name for this dinosaur is retained in scientific literature: *Gigandipus caudatus* E. Hitchcock. Hitchcock wondered if this discovery weakened his argument that the Connecticut Valley impressions were made by birds. He felt that his interpretation of phalangeal impressions still pointed to birds, but should this argument fail, “I freely confess that but little ground would remain for such an opinion to rest upon. I confess too, that the evidence is increasing for the supposition, already repeatedly hinted at by me in former descriptions of footmarks, that many of these extinct animals may have belonged to a type of animal existence intermediate between that of birds and the lower classes of vertebrates.” This was a remarkably predictive few words, because they allowed for the possible existence of animals who were the ancestors of birds!

Silliman informed Hitchcock (10.13.55) that Dana, reacting to the discovery of *Gigandipus caudatus*, said that “there is no animal without four limbs developed or rudimentary, but he agrees that our colorful tail-dragging animal may have been effectively a biped depending on enormous limbs & feet for support & progression, aided by a tail for a third supporting member & for direction while there may have been arms in advance of the legs & serving as prehensile or defensive organs, kangaroo fashion. If this view is correct, it adds a new and interesting feature to fossil herpetology & extricates us from serious difficulty as to the walking with the impress of only two feet.” Despite this correct analysis, Hitchcock held to his avian conception, and Silliman agreed with him.

In 1858, Hitchcock published *Ichnology of New England*, a volume of 220 pages with sixty quarto plates, a handsome production that is his paleontological monument and still often referred to. His outlines of the impressions, by then made by tracing over glass plates atop them, were subjected to the new photographic process “Ambrotype” as models for the lithographer. His illustrations record 128 species: worms, insects, crustaceans, fish, tortoises, lizards, toads or frogs, animals like marsupials, reptiles walking on hind feet (he avoided “dinosaurs”), and thirty-one species of birds. Hitchcock now gives up the idea, still prevailing among several colleagues, that some layers were deposited at a sloping angle. He states instead, correctly, that the inclines of sedimental strata were caused by upheavals. As for the birds, Hitchcock, the least dogmatic of observers, describes the difficulties of deciding amongst tracks that are often much alike; some might be birds, other similar ones, reptiles. He admits that recent discoveries of fossils weakens his arguments for birds, but the evidence still favors his deductions.²⁸⁹

By 1863, in his last year of life, Hitchcock had further refined his lists and conceptions of the track makers.²⁹⁰ He noted that some he had thought to be birds were now recognized as upright quadrupeds and that after all, he could no longer distinguish birds from quadrupeds on the basis of the number of phalanges. More fully than in *Ichnology* of 1858, he acknowledged the difficulties of separating the tracks into clearly defined species, but he wasn’t willing to desert birds entirely. We can sympathize: they had been at the center of his paleontological work since 1836. And he had just found new and unexpected support for bird tracks in the discovery of *Archaeopteryx*, the well-preserved feathered skeleton of a theropod dinosaur. Found in 1861, it had just been published and named by Owen. Although aged and infirm, Hitchcock still had his ear to the ground! (He might have heard that Darwin was excited by the new discovery, and called *Archaeopteryx* a “bird.”) Further, in his article Hitchcock included a letter from Dana who endorsed the idea of “reptilian birds” in ancient times. In the same months of 1863, Hitchcock was acquiring more fossil footprints²⁹¹, and preparing his *Supplement to the ichnology of New England*, published posthumously in 1865, and there he drew lessons from the *Archaeopteryx* to analyze some of the tracks he considered avian.

Today Hitchcock’s “birds” no longer seem a far-fetched deduction, because his tracks are recognized as the impressions of theropod dinosaurs, the ancestors of birds. Already in 1868 T. H. Huxley had proposed birds as descendants of dinosaurs. Martin Lockley, who has summarized Hitchcock’s place in paleontology, wrote that the new classifications “mean that Hitchcock was right all along: The tracks were indeed those of special types of

²⁸⁸ Hitchcock, “On a new Fossil Fish, and new Fossil Foot marks” *AJS* ns 21 (1856): 96-100 (p. 99). This article was drawn from Hitchcock’s presentation to the AAAS meeting in Providence in August 1855. In the same year, he examined tracks uncovered in nearby Turner’s Falls, and wrote Silliman (10.3.55): “My impression is that it will cast a good deal of light upon the footmarks & I am not without fears that it will weaken or destroy the proof that any of the tracks are those of birds.”

²⁸⁹ In 1861, hoping to reinforce his weakening belief in birds, Hitchcock wrote Owen to ask if he would identify the fossil prints with living birds (EOH, box 5, folder 8, copy of letter of 7.4.61).

²⁹⁰ Hitchcock 1863, “New Facts.” That year he also purchased a large collection of tracks from Roswell Field of Gill (the receipt is in EOH, box 2, folder 21), so he continued to regard the Amherst College collection as his enduring monument.

²⁹¹ On February 14, 1863, Hitchcock bought a number of foot tracks from Roswell Field of Gill, who signed his receipt for \$750: EOH, box 2, folder 21.

bird; not creatures identical to modern turkeys, but their ancient theropod ancestors.”²⁹² Ichnology of New England is still in print, and Hitchcock’s nomenclature is retained for more than a dozen track makers, like *Hyphepus fieldi*, *Otozoum moodii*, and *Sauropus barrattii*, each with the suffix E. Hitchcock. Paleontologists still travel to Amherst College’s museum of natural history to see Hitchcock’s sandstone tracks, the largest collection in the world, and historians of American literature, as Dennis R. Dean has shown, have given Hitchcock’s tracks a distinctive literary fortune.²⁹³ In 1839, Melville introduced fossil bird tracks into his novel *Mardi*, and in 1851 in *Moby-Dick* he likened Ahab’s peg-leg dents on the ship’s deck to geological stones. In 1845 Longfellow, in “To the driving cloud,” imagined a chief of the Omahas stalking “through the city’s / Narrow and populous streets, as once by the margin of rivers / Stalked those birds unknown, that have left us only their footprints.” In following years, the stony tracks were invoked again by Longfellow, Thoreau, Oliver Wendell Holmes, and James Russell Lowell who referred to Hitchcock’s bird traces as veritable geological monuments. Hitchcock was, wrote Dean, “the last American geologist to leave a personal mark upon our creative literature.” He is, however, something of a historical fossil himself who still awaits the fullness of archeological investigations that could restore him to public view.

²⁹² Lockley, *Tracking dinosaurs* (Cambridge and New York, 1991), p. 190. For a thorough vindication of Hitchcock, see Robert T. Bakker, “Dinosaurs acting like birds, an homage to the Reverend Edward Hitchcock . . .,” *Feathered dragons*. Ed. by Philip J. Currie et al. (Bloomington 2004), pp. 1-11.

²⁹³ Dennis R. Dean, “Hitchcock’s dinosaur tracks,” *American quarterly* 21 (1969): 639-44.

Appendix A. William Maclure (1763-1840)

Benjamin Silliman considered himself fortunate to know William Maclure, who was a generous contributor to the *American Journal of Science* from its founding in 1818.²⁹⁴ In 1809, Maclure, a wealthy naturalized American born in Scotland, published the first colored geologic map of the United States accompanied by a short treatise based on his extensive travels across the country.²⁹⁵ He used four colors to locate (rather grossly) the major rock forms east of the Mississippi. He returned to Europe, and then in 1816 he made the first geological survey of the Lesser Antilles.²⁹⁶ In 1817 he greatly enlarged his treatise of 1809 and printed a revised map, but he didn't add significant new geological findings.²⁹⁷ He continued to use Wernerian terms but not Werner's whole system, limiting himself to observed facts and deploring speculative theories. Also in 1817, he was named President of the Academy of Natural Sciences in Philadelphia. Silliman had met Maclure in 1808, and courted him ten years later when he founded his new journal. He counted on Maclure's stature and probably knew he would become a generous benefactor. Further, when Silliman established the American Geological Society in New Haven in September, 1819, he assured that Maclure was made its president.²⁹⁸ Maclure was so notable that the second decade of the century was called "The Maclurean Era" by George P. Merrill, author of the most detailed study of American geology of the nineteenth century.²⁹⁹

Given Maclure's place at the heights of American geology in 1818, one is surprised to learn how quickly he fell into arrears, a retreat documented by his contributions to the *American Journal of Science*. It's true that he frequently sent books, journals, and mineralogical specimens to Silliman for the American Geological Society, but already in his first contribution to Silliman's journal he rejected the growing evidence that some geological strata were the same on both sides of the Atlantic.³⁰⁰ Advances in geological knowledge were being made precisely because increasing knowledge and use of fossils showed that Europe and America shared some of the same strata; the limitations of localized geology were now being made evident—but not to Maclure.

From 1819 through 1825 Maclure traveled widely in Europe, but only occasionally made geological observations. In 1822, he sent Silliman an article from Spain in which he persisted in his Wernerian view that water was "the principal agent in changing the form of the earth's surface."³⁰¹ A year later, Silliman reported on several communications from Maclure who wrote that the Wernerian and Huttonian systems could be reconciled. In further letters that Silliman published from 1824 to 1826, Maclure announced more gifts of books and specimens to the American Geological Society, gossiped freely about his travels, and expanded his comparisons of European and American geology. He attacked European geologists because they depended upon theories, "fabricated in cabinets, originating more out of literature than of science." American geologists were superior and have advantages of "the simplicity, regularity, and undisturbed state of the stratification of our field of observation." He took comfort in believing that "authenticated practical facts" kept American students "out of the reach of quackery, and of imaginary theories" of the Europeans. His unwillingness to recognize recent advances in geology and theory continued through the decade. In 1829, he objected to Cordier's thesis of the heated depths of the earth, endorsed by Hitchcock and partially by Silliman,³⁰² because it's obvious, he wrote naively, that ocean water grows colder with depth!

²⁹⁴ There is no modern book on Maclure, but there are important and informative articles, including the following: I. Donnachie, "William Maclure: Science, Pestalozzianism and reform in Europe and the United States," *The encyclopedia of informal education* (online resource, www.infed.org, 2003); D. J. McLaren, "Robert Owen, William Maclure and New Harmony," *History of education* 25 (1996): 223-33; Josephine Mirabella Elliott, ed., *Partnership for prosperity: the correspondence of William Maclure and Marie Duclos Fretageot, 1820-1833* (Indianapolis, 1994), and Dennis R. Dean, "New light on William Maclure," *Annals of science* 46, 6 (Nov. 1989): 549-74. Large extracts from several of Silliman's letters to Maclure from 1822 to 1835 are given in Fisher, *Life*, pp. 41-51.

²⁹⁵ Maclure, "Observations on the geology of the United States, explanatory of a geological map," *American philosophical society transactions* 6, 2 (1809): 219-20.

²⁹⁶ Maclure, "Observations on the geology of the West Indian Islands, from Barbados to Santa Cruz, inclusive," *Journal of the academy of natural sciences of Philadelphia* 1 (1817): 311-23.

²⁹⁷ Maclure, *Observations on the geology of the United States of America* (Philadelphia, the author, 1817).

²⁹⁸ Silliman, *AJS* 2, 1 (1820): 139-44. Silliman was one of the vice presidents, and Hitchcock one of the corresponding secretaries.

²⁹⁹ Merrill 1924.

³⁰⁰ Maclure, "Hints on some of the outlines of geological arrangement, with particular reference to the system of Werner," *AJS* 1, 3 (1819): 209-13.

³⁰¹ Maclure, "Some speculative conjectures on the probable changes that may have taken place in the geology of the continent of North-America east of the Stoney Mountains," *AJS* 6, 1 (1823): 98-106. Maclure signed the article "Madrid, July 9, 1822."

³⁰² Cordier 1828.

Silliman's journal also disclosed Maclure's more forward-looking ideas. He championed the ideas for children's education of Johann Heinrich Pestalozzi (1746-1827), an influential Swiss educator whom he visited several times and whose work he subsidized in the United States. He was a cofounder with Robert Owen of the utopian community in New Harmony, Indiana. His last major work was *Opinions on Various Subjects, Dedicated to the Industrious Producers*, three volumes published in New Harmony from 1831 to 1838. There he recommended mineralogy as the first subject of children's education in clays, lime, rock, metal, and their practical applications, a fitting merger of his lifelong preoccupation with science and progressive education.

Appendix B. Amos Eaton (1776-1842)

From 1818 to 1830, Amos Eaton published twenty-six articles, short notices, and letters in the American journal of science. These writings chart the trajectory of a talented and singularly ambitious scientist. Unlike Maclure, whose geology steadily declined during that decade, Eaton's science gained in productivity and influence. Merrill called the 1820s "the Eatonian era." He was, however, a man with flaws of both professional and personal kinds, shortcomings that have been glossed over because of his rise to fame but that become very evident when looking into Silliman's journal and the Silliman-Hitchcock correspondence.

From 1802 to 1810, Eaton practiced as lawyer and land agent in Catskill, New York, and also studied the natural sciences.³⁰³ In 1810 he gave a "school" of lectures on botany in Catskill, but was convicted of forgery and sent to prison the next year. While in jail he continued to study botany and geology, and benefited from the friendship of Samuel L. Mitchill (1764-1831), scientist and state politician. Recommended by Mitchill to Silliman when he was freed, Eaton spent a year at Yale in 1816, working with Silliman and Eli Ives, professor of materia medica and botany. In 1817, he began a successful career as freelance lecturer on natural philosophy in the Hudson Valley and western New England, supported by paid tickets to his very popular "schools" of lectures.

Eaton spent two months in Northampton in 1818, lecturing and geologizing. Edward Hitchcock's colleague, Dr. David Hunt, was his host. Hitchcock renewed acquaintance with Eaton; he had attended his lectures in Amherst the previous year.³⁰⁴ Silliman published the first of many articles by Eaton in the American journal of science that year, the date also of Hitchcock's first contribution to the journal. From that time forward, the three men intersected one another in Silliman's pages. Eaton's ambition rankled with Hitchcock, as we shall see, but Silliman, ever the cautious editor, always treated Eaton with cordial deference. He was probably unaware of Eaton's low opinion of him, indeed of Eaton's callousness, revealed in the latter's letter to John Torrey of June 24, 1820. "I have now ascertained, to my full satisfaction, that I am the only person in North America, capable of judging rock strata. Silliman does not know how to distinguish the old red sandstone from the more recent (breccia), nor puddingstone from breccia, nor greywacke from greenstone trap. At least he has committed most horrible mistakes in all these cases. On the whole he is no geologist at all . . ."³⁰⁵

Ever anxious to make up for lost time (he was forty-two in 1818), Eaton published *An Index to the geology of the northern states in Albany* in 1818, reprinted in 1820. He gathered much of his information from published sources and from colleagues, to which he added the fruits of his own geological prospecting. He adhered to the Wernerian thesis of oceanic origins while he reconciled the Mosaic deluge and geology by adopting the growing consensus that the "days" of Genesis were long periods of time that accounted for the multiple layers of ancient rock. From 1819 onward, based in Troy, New York, Eaton continued to lecture widely. He soon enjoyed the financial support of Stephen Van Rensselaer (1764-1839), politician and wealthy landowner. Van Rensselaer commissioned Eaton to make geological surveys of Albany County and of the route of the Erie Canal, work that Silliman welcomed in his journal. Then in 1824, Eaton induced his patron to found the Rensselaer School (later the Rensselaer Polytechnic Institute), which became his institutional fiefdom until his death in 1842.

Eaton's first article for the American Journal of Science appeared in its second issue.³⁰⁶ Signed "Southampton, Aug. 26, 1818," it's devoted to the lead mine in Southampton that Silliman had earlier explored.³⁰⁷ In his article, Eaton stated that his Northampton host Hunt "observed that you [Silliman] had expressed an opinion, that an attentive examination of all the strata" at the mine's shaft would be welcome, and he has now completed "the labour which you had marked out." In fact, Eaton had elbowed Hunt, Hitchcock, and Stephen Williams out of the way. Earlier that year Hitchcock wrote Silliman that he and Williams would examine the mine pursuant to the Yale professor's request to them.³⁰⁸ They obviously were glad to defer to Eaton's superior

³⁰³ My references to Eaton's biography come from McAllister 1941,

³⁰⁴ "I always regarded him as the chief agent of introducing a taste for these subjects [natural history] into the Connecticut Valley." Hitchcock 1863, *Reminiscences*, p. 286. It was from Hitchcock that Silliman obtained Eaton's current address in 1818 (Silliman to Hitchcock, June 22, 1818).

³⁰⁵ Quoted in McAllister 1941, p. 285.

³⁰⁶ Eaton, "Account of the strata perforated by, and of the minerals found in, the great adit [sic] to the Southampton lead mine," *AJS* 1, 2 (1818-1819): 136-39.

³⁰⁷ Silliman, "Particulars relative to the lead-mine near Northampton (Massachusetts)," *The American mineralogical journal* 1, 2 (1810): 63-69.

³⁰⁸ Hitchcock to Silliman, April 6, 1818. In a letter of March 31, 1818, Silliman had asked Hitchcock and Williams to look into the mine, remarking that Hunt "will furnish facts but will not write."

knowledge. Eaton's article, however, didn't satisfy Silliman, and he wrote Hitchcock to encourage further research at the mine.³⁰⁹

From 1820 to 1822 Eaton contributed three minor accounts of the localities of minerals to Silliman's journal, and one of greater interest, "An outline of the geology of the highlands, on the River Hudson."³¹⁰ Dated July 3, 1822, this paper described the strata along a fourteen-mile ridge near West Point. Besides his contributions to Silliman's journal, Eaton published a pamphlet in 1821 that offers insights into his itinerant lecturing: *Chemical note-book for the country class room* (containing memoranda of principles to be illustrated by short courses of experiments in country villages), and two years later another short but ambitious publication, *Proposed geological nomenclature* (Albany 1823). This little book upset Hitchcock, who complained to Silliman about the Troy scientist's new names for rocks, and urged him to make objections to Eaton. "I presume you cannot approve of such cutting or slashing [of nomenclature] especially before the man knows whether our secondary strata do not correspond to the European rocks."³¹¹ In this remark, Hitchcock pointed to Eaton's failure to recognize that some European and American strata shared the same characteristics. He objected to Eaton's renaming a rock that Hitchcock had accurately described in his study of Connecticut Valley geology,³¹² and feared that Eaton "has an itch for being the author of a new system." He told Silliman that Eaton would continue his errant ways "unless he is plainly told to & by some one like yourself whose opinion he dare not despise. I shall regret to see his sketch of the Canal come out in the trammels of his new nomenclature."

At the end of 1823, the Yale editor announced the start of Eaton's survey of the region alongside the Erie Canal commissioned by Van Rensselaer, "the patroon of Albany."³¹³ The founding of the Rensselaer School in 1824 didn't interfere with Eaton's survey which, with its extensions, occupied him well into 1830. In an article for Silliman signed March 20, 1824, Eaton wrote that the first part of his survey was now printed, and that its geological section map included the portion from western Massachusetts to Boston duly credited: "Rev. E. Hitchcock's Section."³¹⁴ He quoted Hitchcock's letter that had accompanied his drawing in which Hitchcock said that he was most familiar with the western part of the state, but as for the east: "I have not enough facts . . . and I have, therefore, separated the several formations by perpendicular lines. In the vicinity of Boston, I do not profess to be very accurate, not having examined the rocks there with sufficient attention. I only put down such as I have noticed in travelling over the ground hastily two or three times."³¹⁵

Hitchcock was furious when he read Eaton's quotation, for it made him seem like a fool: he hadn't intended that his words be published. "I suppose you have seen Mr. Eaton's *Geology of the Erie Canal*," he wrote Silliman.

I regret that I am thrown forward into so conspicuous a place in it. You will see that my remarks were hasty & desultory. I intended them merely to be incorporated with the body of the work if they could furnish any assistance & expressly cautioned him against what he has done. Should you notice his work in the Journal I wish you could throw in some hint of this kind: for I really believe as it is I shall suffer. If I had thought myself preparing an essay for such a place or that I was to be pitted against Mr. Eaton as he seems to regard me, I should have taken more pains."³¹⁶

Silliman was aware of Hitchcock's dismay, so when he reviewed (anonymously) Eaton's *Erie Canal*, he wrote that "Mr. Hitchcock's section is accompanied by a concise description, furnished by him, not (as we understand) with a view of having it published in its present form, but merely as materials contributed towards the completion of the great design."³¹⁷

³⁰⁹ "Some further notice of the Southampton lead mine would still be acceptable should it ever be convenient to you to make it, for, Mr. Eaton's account embraces only the subsurfaces found in the level which they have carried into the hill and does not embrace any account of the present state of the concern in other respects." Silliman to Hitchcock, Dec. 11, 1818.

³¹⁰ Eaton, *AJS* 5, 2 (1822): 231-35.

³¹¹ Hitchcock to Silliman, Oct. 20, 1823.

³¹² Hitchcock 1823, "A Sketch."

³¹³ *AJS* 6, 2 (1823): 373-74.

³¹⁴ Eaton 1824, p. 158.

³¹⁵ Hitchcock's long letter to Eaton, August 12, 1824, is in the Simon Gratz Collection of autograph letters in the Historical Society of Pennsylvania.

³¹⁶ Hitchcock to Silliman, May 28, 1824.

³¹⁷ *AJS* 8, 2 (1824): 358-62.

Hitchcock had another reason to be irked. In his survey, Eaton used the term “diluvium” as explained “by Phillips and Conybear [sic], in their last work on the geology of England and Wales.”³¹⁸ Yet in a published letter to Silliman signed March 16, 1824, Eaton had written that Phillips and Conybear’s system and nomenclature couldn’t be adopted in the US because it disagreed with observations and Wernerian names for the upper strata of geological formations.³¹⁹ Did Eaton know that Hitchcock was the anonymous reviewer of Conybear and Phillips in an earlier issue of Silliman’s journal?³²⁰ Hitchcock had praised the two British geologists for willingness to lean toward Huttonian views, as he did himself, he wrote, without disavowing Werner. In his review, probably thinking of Eaton and other latter-day Wernerians, Hitchcock commented that “it is astonishing how attachment to a particular system will warp the judgment of a geologist in his observations.” In opposition to Eaton, Hitchcock explicitly applied Conybear and Phillips to the “diluvial” formations in American sites along the New England coast.

A few months later, Silliman allowed Hitchcock to dispute Eaton in an article attributed to the anonymous author of the review of Conybear and Phillips.³²¹ Hitchcock wrote that although he hadn’t recommended the adoption of Conybear’s new classification of rocks, he indeed viewed it favorably. Eaton, he wrote, maintained Wernerian views that aren’t neutral, but tied to hypotheses that had been challenged. Further, Eaton believed that the anonymous reviewer neglected American geologists and exalted Europeans. Hitchcock answered that geologists constitute “one great family” which “embraces the whole world” and whose feelings “check our national partialities. . . . We do not, however, wish to conceal the fact, that we regard Europe, rather than America, as the centre of geological science...” European geologists have been at work far longer than Americans, and have many more specialists and collections. “We make not these comparisons because we think meanly of American geologists, nor because we wish to inculcate any servile deference to Europeans. . . . But in matters of science, we wish things to be stated just as they are, and we are not willing to be warped by national particularities, or envious rivalries.” Hitchcock comes out of this exchange as a more progressive and cosmopolitan thinker than Eaton, whose chauvinism he makes apparent.

Chester Dewey, when he reviewed Eaton’s survey publication later that year, was more forgiving, but he objected to the Troy scientist’s coining of new terms. He said that the famous Buckland had complained that Eaton affected “some needless novelties in technical language.” Dewey agreed, writing that Eaton should heed Conybear and Phillips and that it would be better if “the common nomenclature of the rocks had been altered with a more sparing hand.”³²² Not at all chastened by such criticism, Eaton persisted in his new names. In a letter to Silliman signed November 23, 1826, he proposed “ultimate diluvion” for a stratum near the surface. “You may be surprised at this new name. I do not like the name; but I take it for the present. You have more than once cautioned me against new names But I have either discovered a new stratum, or I have misinterpreted the descriptions given by others. . . . From some expressions used by Buckland, and also from others employed, some by Conybear, and even by Cuvier, I was inclined to believe, that they had observed similar facts without drawing any extensive conclusions.”³²³ In other words, these other geologists had seen this stratum but had failed to recognize its unique place in the sequence of strata. Eaton undermined his case, however, because he reiterated his belief in the Mosaic deluge, saying that during the final days of the great flood, “the last and, consequently, the finest sediment was deposited upon every formation which was then uppermost.” He believed his “ultimate diluvion” covered the hardpan of the “vast area west and southwest of Catskills, and most of high ranges of NEng.” This pure Wernerian concept wasn’t accepted by others.

There are more signs of Eaton’s attempts to put himself in the forefront. In the issue incorporating his letter to Silliman, he published a short paper, “Improvement in the manufacture of Magnetic Needles.”³²⁴ His “improvement” was put down in Silliman’s next issue by an anonymous “surveyor” who wrote that Eaton wasn’t justified to suggest that the tips of needles be coated in brass, because this demonstrably weakens the magnetic effect.³²⁵ Eaton made no response to this in the American journal of science, but he remained prominent in its

³¹⁸ Eaton 1824, pp. 159-60.

³¹⁹ “Ought American geologists to adopt the changes in the science, proposed by Phillips and Conybear?”, *AJS* 8, 2 (1824): 261.

³²⁰ Anon. [Hitchcock], “Review of ‘Outlines of the geology of England and Wales’ . . . London, 1822,” *AJS* 7, 2: 204-40.

³²¹ Anon. [Hitchcock], “Remarks additional to the review of Conybear and Phillips . . . with reference to the communication of Professor Eaton in the last No. of this work,” *AJS* 9, 1 (1825): 146-54.

³²² Dewey [“C.D.”], “Notice of Prof. Eaton’s geological survey of the district adjoining the Erie Canal,” *AJS* 9, 2 (1825): 355-56. In a letter to Hitchcock (12. 27.24), Silliman said that he had written Eaton to censure him for his arrogance.

³²³ Letter published by Silliman, *AJS* 12, 1 (1827): 17-20.

³²⁴ Eaton, *AJS* 12, 1 (1827): 14-16.

³²⁵ Eaton, *AJS* 12, 2 (1827): 231-34.

pages. In mid-1828, Silliman announced the pending publication of the second part of Eaton's survey of the Erie Canal, to be bound with the first portion in one volume.³²⁶ This was never accomplished, but Eaton continued to be very productive. In 1828 he published in Albany A geological nomenclature for North America.³²⁷ In a second part of this article, he wrote: "Though I have devoted more time to American geology than any other person, and that too under the most favorable auspices," his vast work was only begun and his nomenclature wasn't yet "a perfect system."³²⁸ He defiantly continued his use of Wernerian terms for classes of rocks (primitive, transition, secondary....) "because I cannot discover any advantages in the proposed alterations." To Werner's system he added some recent terms for volcanic or basaltic rocks and his own "ultimate diluvion," saying that nothing had been published on this term since he had introduced it, although others had observed this stratum. He clung to many terms that others had discarded. "And I prefer the old general application, Detritus, to tertiary formation." He continued to boost American geology because European strata are of limited proportions that give less evidence and therefore deductions from them have less merit.

Eaton did himself few favors with two articles that Silliman published in 1829. In one, he wrote that workmen had eaten "live molluscous animals" found near Rome when they were cutting through a ridge of hard compact gravel. They took these animals from a depth of forty-two feet, "fried and ate them." Eaton examined the creatures' shells, identified as *Mya cariosa* and *Mya purpurea*. The deposit "is decidedly diluvial; consequently these animals must have lain from the time of the deluge. . . . Therefore the lives of these animals are greatly prolonged by exclusion from air and light, or their natural age is more than three thousand years."³²⁹ He revealed his credulity again in the next issue of Silliman's journal, "The number five, the most favorite number of nature."³³⁰ He went so far as to write that five even characterizes the successive stages of a sudden death he had observed. Eaton was decidedly a more credulous man than the very religious Hitchcock. In the same issue as Eaton's encomiums on the number five, Hitchcock identified a newly discovered specimen of tin in Massachusetts which he had analyzed under the "oxy-hydrogen blow pipe"—a revealing contrast between the two men's conceptions of what constituted science.³³¹

From 1830 to 1840, Eaton contributed seventeen papers to Silliman's journal, short notices on a variety of topics: chemistry, mineralogy, botany, and geography. They were mostly descriptive and didn't break new ground. However, in the decade before his death in 1842, his renown and his influence spread. Had they been asked, his contemporaries would have judged him as Silliman's equal and Hitchcock's superior. His lectures and "schools" across New England and eastern New York made him America's most famous popularizer of natural science for two decades. Eaton knew how to use Stephen Van Rensselaer's fortune to support his scientific work, and that places him among the many middle-class entrepreneurs of the nineteenth century who turned landed money into durable intellectual legacies.

The Correspondence of Edward Hitchcock and Benjamin Silliman 1817-1841: The Letters

Transcribed and annotated by Robert L. Herbert

Letters are from Orra White and Edward Hitchcock Papers, Archives and Special Collections, Amherst College except where otherwise noted.³³² Silliman's execrable hand presents difficulties because he frequently ran his sentences and paragraphs together with trailing calligraphy. For clarity I have often added periods, semicolons, or paragraph breaks to both men's letters. I have preserved their occasional idiosyncratic spellings.

³²⁶ Eaton, AJS 13, 2 (1828): 383-85.

³²⁷ Eaton, "Geological nomenclature, classes of rocks, &c.," AJS 14, 1 (1828): 145-59.

³²⁸ Eaton, AJS, 14, 2 (1828): 359-68. In a footnote he fulsomely thanked Van Rensselaer for his "most favorable auspices," the defraying of his expenses "for the last seven years, at a cost of "more than eighteen thousand dollars."

³²⁹ Eaton, "Gases, acids, and salts, of recent origin and now forming, on and near the Erie Canal, in the State of New-York; also living antediluvian animals," AJS 15, 2 (1829): 233-49.

³³⁰ Eaton, AJS 16, 1 (1829): 172-73.

³³¹ Hitchcock 1829, "Tin," pp. 188-91.

³³² Paragraphs from the Silliman-Hitchcock letters of 1819 to 1830 were published, with a few mistaken and omitted words, in Fisher *Silliman*, as follows: Hitchcock to Silliman 10.20.23, and Silliman to Hitchcock, 8.18.20, 3.20.24, 7.27.25, 6.1.27, and 3.11.30. Fisher published one paragraph of a letter from Hitchcock to Silliman of 1.29.19. The original of this letter is lost, otherwise the letters are in the Amherst archives.

= undecipherable syllable or word

= more than one undecipherable word

[?] = syllable or word probably but not certainly transcribed correctly

[torn loss] = portion of paper torn out, typically when sealing wax was pried away

AJS = *American journal of science*.

Box = File location in EOH.

BS = Benjamin Silliman.

EH = Edward Hitchcock.

EOH = Orra White and Edward Hitchcock Papers, Archives and Special Collections, Amherst College.

BS to EH, Box 3, folder 37

“New Haven, Aug 24 1817.

Dear Sir,

You will find I believe most of your questions answered in the memoranda in the box. The Garnets appear to be the Melanite – they are very fusible & then become attractable by the magnet – viz after being pulverized. The copper ores of the our Greenstone Hills are generally poor -- still some fine pieces of native copper have been found in this vicinity.

I am happy to see your are busying yourself with mineralogy and geological observations. I wish you would inform me how far above you the greenstone extends – what rock lies under it & what rocks preceed [sic] where it terminates. Should find any more of the Chabasie I should like a specimen. Send you a piece of our verd antique marble.³³³

Yours respectfully tho in haste,
B Silliman”

EH to BS, Box 5, folder 12

“Deerfield, September 1st 1817.

Honoured Sir,

I received the box of minerals I requested you to name and feel very grateful to you for bestowing so much labor on them and also for the very valuable and unexpected addition you made to them from your own cabinet. I venture to send a few more specimens for your inspection but fear I am troubling you too much. If it is not perfectly agreeable and convenient I beg you would not trouble yourself to attend to them.

I send some slaty greenstone as you requested. I should say that one third of the greenstone in this vicinity is similar to this although the laminae are not generally so thin. This slate generally has rent the columnar greenstone and then succeeds the amygdaloid -- at least I have noticed this succession in several instances. I also send a specimen of nearly all the varieties of rock I find on this range, which I beg you to keep or throw away as you please. Any other specimens in the boxes you wish for you are requested to keep and only send back as you please.

I supposed some months since that I had determined how far the greenstone extends above Deerfield and that pudding stone succeeded to it but from some circumstances I am inclined to think I have not. I have been so much engaged since you wrote that it was impossible for me to attend to it further. I have almost completed a geological map of the country for a dozen miles on each side of Connecticut river and from Northampton to Vermont on which I intended to put down the termination of the greenstone, and I had prepared an account of such geological and mineralogical facts as I have been able to obtain that have not been noticed in this section. I hope in two or three weeks to be able to complete the whole and if I suppose it would be of any service I would send it to you.

I had almost despaired of being able to send you any specimens of Chabasie worth accepting, but having penetrated farther into the greenstone this afternoon I find it more pure, though I do not know that the specimens I send are scarcely worth accepting, since I have never seen any except that which I found in Deerfield. On any of

³³³ In 1811 Silliman had discovered beds of green marble being used for tables, fireplaces, etc., which he likened to European *verd antique*: AJS 1, 1 (1818): 44.

the specimens I send you will find two forms of crystals, viz. one of them described by Cleaveland,³³⁴ a rhomb, and the other like the primitive form of the Staurolite, a right prism with rhomboidal bases. The angles of these rhombs are 60° & 120°. Are these last mentioned crystals described by mineralogists?

I am convinced that the chabasia is abundant in our greenstone, but the weather has injured the specimens near the surface.

I ought to mention that I am assisted in the collection of minerals by Dr. Stephen W. Williams of this town.³³⁵ We have to labour with many difficulties and I hope you will from this consideration excuse our many inaccuracies.

I was detained so long this afternoon in obtaining some chabasia that I have been obliged to put up the minerals in a bungling manner & to write this in great haste as Mr. Nims starts for N. Haven early tomorrow morning.

Respectfully sir your obedient obliged servant,
Edward Hitchcock”

BS to EH, Box 3, folder 37
“New Haven Octob^r 6th 1817.

Sir,

I have looked over the specimens which you lately sent me by Mr. Nims & now return those which I suppose might be interesting to you to have again.

I am gratified with the chabasia – the specimens are very pretty & as the mineral has not been found in this country before (except perhaps at Baltimore) I am interested to obtain more specimens for distribution should you hereafter succeed in obtaining abundance of it.

Your geological map I should be pleased to see & if not asking too much of you a copy of it would be very acceptable.

I am disposed to think that the slaty greenstone which you sent is accidental in its form & not a proper slate; it looks as if it was merely the result of those fractures to which greenstone is liable & which are sometimes vertical, sometimes horizontal. Probably these fragments do not uninterruptedly extend very far horizontally but are rather collections of detached pieces than possessing the genuine schistose structure; if I am wrong on this point you will inform me.

The specimen of polished Milford Marble which I send you is only partly polished; it admits of such a lustre as to make it almost a perfect mirror.

With every disposition to promote your mineralogical & geological studies, I remain respectfully your ob. servant,
B Silliman”

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania
“Deerfield October 16th 1817.

Honoured Sir

The bearer of this is Mr. Havel [?] Griswold of Greenfield who contemplates entering at Yale College as a student. He has lived in the same family with myself for a considerable time and has conducted himself so as to gain the good will of all. I think he will pass a tolerable good examination: yet he is diffident and may be too much agitated. I think his character as to correct feelings and habits to be formed and that he is calculated to make a good & useful member of society. I make these observations in consideration of my high esteem for Mr. Griswold.

After much exertion to complete things I send the geological maps &c. I must send the observations without putting a correcting hand to them. I scarcely know what to say concerning them. It was my intention after revising the observations if they appeared of sufficient value to offer them to some society. Perhaps this idea is presumptive: if it is I beg you Sir, frankly, to tell me of it and I will sincerely thank you. I have been at considerable trouble to get facts correctly and have endeavoured not to overstate them. All of them may not be minutely correct but I hope they are generally so. Perhaps I am hasty in putting down stilbite and analcime among the minerals. Yet the specimens I have found since I wrote you before (some of which I intend to send with this) I think have more decisive external characters than any I have sent you. But I refer the decision to your better

³³⁴ Parker Cleaveland (1780-1858), *An elementary treatise on mineralogy and geology...* (Boston 1816).

³³⁵ Stephen West Williams (1790-1855) was a Deerfield physician and specialist in medical botany who collaborated closely with Hitchcock from 1816 to about 1822.

judgment. It may be also that I have not found the oxide of Titanium. I send you some specimens of it. The larger geniculated specimen I should like to have returned as I have no other like it. Any of the other you may keep if you wish. I hope to get some better specimens soon as I am convinced it is in considerable quantities in Leyden. If you wish I will then send you some.

I have been much assisted in the execution of the maps by Miss White, preceptress of Deerfield Academy. Perhaps it is not strictly proper to introduce the views of Sugar Loaf & the Falls in such an essay as this. Yet they are striking features in the physical character of this section of the country.³³⁶

You will find all the facts relating to the position & termination of our greenstone that I have been able to collect. If your queries are in any measure answered I shall be gratified.

Mr. Griswold intends to return in a few weeks and would be a careful hand to bring the maps should you have done with them. I fear I shall trouble you too much in requesting you to look over the whole.

I have to acknowledge my renewed obligation to you for your attention to my queries and for the valuable additional minerals sent. Engaged as I know you must be on more important objects I must confess that so much assistance is unexpected.

I am sorry I am able to send you no better specimens of chabasie at this time. It is difficult penetrating the rock and my time has been wholly engaged. In a few weeks I hope I can forward some better specimens. I have not found any more in which the crystals were so large as in one of those I sent you. In great haste, begging pardon for errors, I am Sir, your obliged humble servant,

Edward Hitchcock

N.B. Please to accept the minerals I send except the reservation above mentioned in this letter.”

BS to EH, Box 3, folder 37

“New Haven October 27 1817.

Dear Sir

I am much obliged to you for the box of minerals. The titanium I will return as you request but should you prosecute the research & find more, some duplicate specimens would be very acceptable to me.

I am exceedingly gratified by your geological maps & dissertation. They are very credible both to your industry & discrimination & are particularly interesting to me as describing the northern termination of the greenstone range of the southern part of which I had before given a sketch.

Since you mention the idea of communicating them to some learned society will you not permit me to deposit them with the Connecticut Academy of Arts & Sciences & I will give my influence to have them appear in the first of their publications. Indeed, as their annual meeting is tomorrow evening I believe I shall presume so far on your indulgence as to lay them before the Academy simply as interesting information but without committing you as to their ultimate destination.

I would however mention to you in confidence that a project is in contemplation for the publication of a scientific journal to consist entirely of original American pieces (foreign scientific intelligence only excepted). Should this thing be matured I expect to have something to do with it & should be very happy to have your work appear in the first No. I shall take the liberty to retain your communication till I hear from you again.

Before it is published I would take the liberty to suggest a few slight emendations not affecting the body of the performance. I am gratified if any attention of mine have been acceptable to you & I am on my part pleased to have contributed any thing to encourage & mature an active & intelligent mineralogist in an interesting district of #.

In haste yours &c,
B Silliman”

BS to EH, Box 3, folder 37

“New Haven Mar 1 1818.

Dear Sir,

It has not been inattention but extreme occupation which as prevented my replying before to your favour of Nov 5th & to your & Mr. William’s joint one of December 1st. I am pleased that you find enough of the Chabasie & shall be obliged to you for more of it when you forward any thing this way. You will also please

³³⁶ Orra White’s drawing *Falls on Connecticut River, at Gill, Mass.* was published in *Port Folio* (Philadelphia) in December 1818. See Hitchcock’s letter below, Sept. 28, 1818. White (1796-1863) married Hitchcock on May 31, 1821.

accept my thanks for your last box – that for NY. was duly forwarded.³³⁷ I thank you for your permission to use your communication & shall be glad to avail myself of it for an early No. of the Journal of which I now send you some prospectus'. [sic] I am certain you will do any thing in your power to promote its objects & I request you to permit me to consider you & Mr. Williams as contributors to its pages. Be so good as to append some blank paper to the prospectus' & cause them to be placed in situations where they will be seen. As I am now much occupied about the Journal I must request your to excuse my brevity & with my regards to Mr. Williams [and] to believe me your very obliged servant, B. Silliman.

[P.S.] "Mr. Hitchcock. Pray give me your & Mr. Williams' titles correctly – are you joint Preceptors of the academy?"

BS to EH, Box 3, folder 37

"New Haven March 31, 1818.

Messrs Hitchcock & Williams. Gentlemen,

I am much obliged to your for the box of specimens by Mr. Griswold which, with that formerly sent, were very acceptable. I assure you I very much value your chabasies & agates & amethyst, titanium &c &c, & as I expect to send a good many of them away, more would be very acceptable should you abound & hence no other more interesting destination for them. It is however unreasonable for me to ask for any thing more than what you can with perfect convenience spare & if there is any thing acceptable which I can send you in return I will cheerfully do it.

Mr. Griswold mentioned that you wished my opinion as to some specimens on the floor of your last box. My impression is that they belong to the grauwacke tribe but I would not vouch for it without more examination.³³⁸

To Mr. Hitchcock. I have this evening been looking attentively at your geological account of the maps & I am of opinion they will do you honour & serve the science. I shall publish them in No. 1 which I hope to have out in May. Should I find it necessary to omit the picturesque part, viz the pictures, will you object? They would be pleasant objects but would add to the expenses without too much advancing the science of the thing.³³⁹

Is not your section of the country reversed? I think it evidently is so, viz the country on the West of the river is pictured on the East & vice versa -- viz -- taking the side of the map from one for North. Did you reverse the arrangement to suit it to the Engraver? If so he must put it upon his plate just as you have it on the paper without reversing it as is usual in engraving.

Immediately after the word chalcedony concluding a sentence you say 'The mass has been noted weighing perhaps an hundred tons.' I believe this cannot mean chalcedony but probably a mass of greenstone which is mentioned just before as occurring among the pudding stone.

I will thank you for an answer as soon as may be as it is time the plates were in hand.

If there is any thing you would add to your essay it will be in season within 2 or 3 weeks.

I remain dear Sir very truly yours with much esteem, BS.

[PS] Messrs Hitchcock & Williams: An account of the Northampton mine in its present state & with the progress made since 1810 when I described it in Bruce's Journal would be very acceptable. Dr Hunt³⁴⁰ will furnish facts but will not write."

EH to BS, Box 5, folder 12

"Deerfield April 6th 1818.

Honoured Sir,

I have this morning received your letter of March 31st and hasten to reply. And first, as to the insertion in your Journal of the pictures or views of certain objects accompanying my geological maps, I beg leave to submit it to your better judgement. I always regarded that part of the communication as of little or no consequence and

³³⁷ Destinee unknown.

³³⁸ Grauwacke or greywacke is a variety of sandstone.

³³⁹ These would be Orra White's drawings of *Sugarloaf Mountain* and *The Falls at Gill*, mentioned in Hitchcock's letter of the previous October 16th.

³⁴⁰ Archibald Bruce (1777-1818) founded the short-lived *American mineralogical journal* in 1810 in New York. David Hunt (1773-1837) was a physician and botanist of Northampton, known to Hitchcock.

never supposed it would be worth the trouble and expense of engraving. I inserted it more because there was space than from an idea that it would be of consequence.³⁴¹

You mention that the section of the country appears to be reversed. I intended that section to be distinct from the map, by whose side it is placed, and not to be governed by the same meridian; that is, bring the map so that its west side shall be towards you, and then the right hand side of the section answering to the bottom of the map will be west, or the top of Hoosack [sic] mountain. I thought the description of it would make it intelligible, but now presume something to be incorrect. Yet as I have not a copy of the map before me I fear I cannot give an explanation that will be satisfactory. I would mention, however, that the granite marked in the section is furthest west, or on Hoosack mountain: next succeeds, as you go eastward towards Connecticut river, the gneiss, then the mica slate, &c.

The 'mass' you mention as refining [?] by the constriction [?] to chalcedony -- is, as you suppose, greenstone. As the sentence originally stood the chalcedony was not mentioned, but on copying it, I thought it best to insert that fact and did not observe the ridiculous effect it had on the following sentence.

An unsound state of health has induced me to contemplate a short journey the present season and, extraordinariness excepted, I hope to be in N. Haven in eight or nine days. If it be not then too late, perhaps I may explain somewhat in regard to the section, and possibly, I may wish to add a few more facts to the essay. I do not wish however to have any thing delayed on my account.

I feel mortified that my blunders should cause you so much trouble and require for their correction so much of your time, which, I am very sensible, must be extremely engaged. I hope the circumstances under which I have written will be some apology for failures, but those you have mentioned ought not to have existed.

We fear we should be quite incompetent to give a description of the S. Hampton mine, particularly when we recollect the amount that has been already given of it in Bruce's Journal. We are ready however to do whatever lies in our power.³⁴²

We will furnish you with pleasure with more minerals of the old kinds, as soon as opportunity offers. Perhaps however we shall wait until we can get better specimens -- the snow being yet on the ground.

Be pleased, Sir, to accept my grateful acknowledgements for your generous treatment of one to whom you were under no obligations, and believe me, with great respect, your very humble servant,

Edward Hitchcock"

BS to EH, Box 3, folder 37

"New York May 22nd 1818.

My dear Sir,

I am here on Journal business and am sorry to say that I find the engraver has not yet commenced your map and now it cannot be done under a month. This with the printing and colouring would delay No. 1 till July and under these circumstances I am constrained to postpone your paper on Deerfield &c till No. 2. I assure you I do it with very great reluctance but I do not see any help for it. I am at the mercy of engravers. I hope you will pardon it. I think No. 1 may be out within 2 or 3 weeks. I remain my dear Sir yours with much esteem,

B. Silliman"

BS to EH, Box 3, folder 37

"New Haven June 22nd 1818.

My dear Sir,

I have duly received yours of the 3rd instant. The date and additions shall be duly annexed to the paper which is still in my hands. I trust we shall not be disappointed as to its appearance in the next No. I should be very sorry to have it kept back longer. I am much obliged by your notice of a second description & for your care to preserve the appearances unbroken. It is now probable that Mr. Olmsted³⁴³ & myself may postpone our excursion till after commencement that we may have the weather a little cooler. I am glad to hear that you continue to discover the chabasie &c & shall be much obliged by the box which you are good enough to promise me, especially as it will come seasonably to enable me to add your interesting minerals to a small collection which I am wishing soon to forward to some of the French Chemists &c. I have received an application through a friend

³⁴¹ Later Hitchcock gave a higher evaluation to Orra White's drawings.

³⁴² It was instead Amos Eaton (1776-1842) who studied the Southampton mine: AJS 1, 2 (1818-1819): 136-39. See above, Appendix B "Amos Eaton."

³⁴³ Denison Olmsted (1791-1859), student assistant of Silliman, subsequently conducted a survey of the geology of North Carolina and published widely on astronomy.

from M. Gay Lussac at Paris for the Scientific Journal & the promise of the annales of Chemistry etc. in exchange.³⁴⁴ This is just what I was wishing.

I am sorry to say that the Journal is detained by the faithlessness of the engraver. I trust however it will be out next week or the week after. I beg you to minute all your observations with reference to it.

I am gratified if you did not think your time misspent in New Haven & cordially invite you to come again whenever it suits your convenience & wishes.

When you write again be so good as to inform me where Mr. Eaton is & is to be for some weeks. If you forward your box of minerals to Hartford care of Dr. Wadsworth Esq it will find me.³⁴⁵

In much haste I remain my dear Sir yours with much esteem & kindness,
B Silliman”

EH to BS, Box 5, folder 12

“Deerfield. July 6th 1818.

Honoured Sir,

I should have made answer to your letter of the 22nd June sooner had I be able to answer your enquiry respecting the residence of Mr. Eaton. I have at length ascertained that he is delivering lectures in Troy and Albany N. York. How long he will continue there I do not know though I presume some time for if I mistake not he is publishing in Albany a second edition of his Botanical Manual.

We are anxious to receive the first Number of your Journal, expecting much gratification from its perusal though we surmise we shall find some of it beyond our capacity. Yet, as Cicero says, si ipsi haec neque attingere neque sensu nostro gustare possemus, tamen ea mirari deberemus, etiam cum in aliis videremus.³⁴⁶

There is little communication between this place and N. Haven that I have yet found no chance to forward a box of minerals. I hope you will pardon my promising so long beforehand. I think it probable I may send them to Mr. Wadsworth as you mentioned. I have been somewhat engaged since I came from N. Haven in collecting the plants growing in this vicinity with a view to inform myself a little on the subject of Botany. Of course I have paid little attention to mineralogy: But I cannot yet say that the former Science is so interesting to me as the latter notwithstanding all the brilliancy of the first. I suspect there are not much short of a thousand plants within the limits of this town.

Messrs. Dennis & Phelps of Greenfield in this County have nearly completed an impression of the last London edition of the Conversations on Chymistry.³⁴⁷

I return you my acknowledgements for your polite invitation to visit N. Haven again: It would be very gratifying to me to be there this summer and hear your lectures on Geology, but I am compelled to follow the dictates of necessity not my own inclination. But wherever I am be assured Sir, that your kindness and assistance to me will not soon be effaced from the mind of your very humble servant,

Edward Hitchcock”

EH to BS, Box 5, folder 12

“Deerfield August 25th 1818.

Honoured Sir,

I have taken the liberty from want of any other opportunity to put a few small specimens at one end of this box for Mr Oliver Bronson, a member of the senior class in your college. The rest you will be so good as to accept and it is probably doubtful whether he (Mr. Bronson) will ever call for the specimens. I do not wish you to be at any trouble about them since they are of little consequence.

This box has been packed nearly two months without the occurrence of any opportunity to forward it.

In haste very respectfully your humble servant,
Edward Hitchcock”

BS to EH, Box 3, folder 37

“New Haven Septr. 25, 1818.

My dear Sir,

³⁴⁴ F. L. Gay-Lussac (1778-1850), French chemist and physicist.

³⁴⁵ Daniel Wadsworth (1771-1848), a Hartford patron of the arts, was an intimate friend of Silliman.

³⁴⁶ From Cicero's *Pro A. Licino Archia Poeta*.

³⁴⁷ Jane Haldimand Marcet (1769-1858), *Conversations on chemistry* (Greenfield MA, 1820).

Your favour of July 6 was received in due time & I am just now put in possession of your note with the titanium in the box of minerals which I have just opened. It came to hand a few days since. I tender you my best thanks for it. The specimens are very good & if we have any thing which I can send you in return which would be interesting, I beg you to let me know it.

I am glad you are interesting yourself in Botany. I regret that I do not understand this science & nothing but incessant occupation prevents me from attempting it. The Journal is open for your botanical as well as mineralogical observations & I should be happy to receive them.

I send you by this mail a copy of the geological map thinking that you might prefer to have one coloured under your own eye. If it is not too much trouble I should be glad you would & then we should be sure of being accurate. Please return it as soon as practicable & the others shall be done after it. If you wish to add any thing to your essay it can be done if sent within three weeks. I am going on in a few days to arrange the papers for No. 2.

I begin to be afraid I shall not see Deerfield this season – at any rate have no references to me in your arrangements.

With much regard my dear Sir, truly yours, B Silliman.

P.S. I hope the degree will be acceptable to you – the diploma is making out.”³⁴⁸

EH to BS, Box 5, folder 12

“Deerfield Sept. 28th 1818.

Honoured Sir,

Your letter with the map was received this afternoon and I have procured it coloured [by Orra White] that I may return it tomorrow morning. I have made a few small deviations from the dotted lines put down by the engraver to mark the formations, but if these deviations should cause any perplexity in colouring I think it will be best to follow the original map. For I find it extremely difficult to say in all cases where one formation ends and another begins, so that I hope you will excuse me if these boundaries should some of them be not laid down in the materially exact. In colouring the strata I believe I have not used the same colours for all the formations that I did in the original, for I have not a copy of the one I made when at N. Haven and I have forgotten some of the colours. I conceive however that it is of little consequence what colours are used since they are not intended to answer to those on the map but only to designate width of the several kinds of rocks.

I am highly pleased with the execution of the map and am apprehensive that the essay will form but a poor counterpart to it. I observe however in the strata annexed to the map an omission that I regret viz. the want of lines to show the inclination or dip of the several rocks. As these lines were small perhaps the engraver did not notice them beneath the paint. I gave the view of the strata more to show this dip of strata to make the precise boundaries of the rocks and as I do not know but it may yet be in season to correct it, I hope you will pardon my mentioning the fact.

I do not know of any other facts relating to the geology or mineralogy of this section that I wish to mark in the essay, unless it be to mention a mineral spring in Shutesbury that has been considerably celebrated & resorted to for two years past and whose waters have been analyzed by D. Gorham,³⁴⁹ and perhaps (if you have not procured it from some other quarter) a short account of the present state of the Southampton mine might be proper to insert. Should I conclude to add any thing I will forward it to you within the three weeks specified. My health is at present so poor I am unable to attend to the subject.

If I had a hundred of the maps here I should be happy to colour them but I suppose this is impracticable on account of the difficulty of getting transportation. The first No. of your Journal has been read with great pleasure in this part of the country. Even many who are unacquainted with natural history seem to take quite an interest in it. Your review of Cleaveland excites peculiar attention and commendation.

I have collected above 800 plants in this vicinity the past summer, 150 of which have been painted by Miss White, the one who painted the maps etc.³⁵⁰ But I have yet little knowledge of botany. I suppose a list of our indigenous plants would not be of interest enough for a place in the Journal and therefore I do not propose to make one out.

³⁴⁸ Silliman arranged the award to Hitchcock of an honorary Master's degree (see below, Silliman to Hitchcock, 12.11.18), probably because he was impressed by his well-advanced knowledge of mineralogy and because he volunteered mineral samples to Silliman.

³⁴⁹ John Gorham (1783-1829), professor of chemistry at Harvard.

³⁵⁰ White taught science and art at Deerfield Academy from 1813 to 1818. She gathered her watercolors of native plants in an album, *Herbarium parvum, pictum* (Deerfield Academy Archives). See Herbert and D'Arienzo 2011, cats. 11-29 and passim.

Miss White also copied & enlarged the view of the falls in Connecticut river which I sent you at first with the maps and I forwarded it to the editor of the Port Folio. He said it would appear in September. I have not seen the [torn loss] for this month yet, and am ignorant whether the painting has a place.³⁵¹

The unexpected conferring of a degree upon me by your college awakens within me the liveliest feelings of gratitude and I have much reason for supposing that you Sir have not been inactive in my favour. Having been completely frustrated in every effort to pass regularly through a college by weakness of sight and of constitution I had relinquished the idea of even acquiring the honors of any church less of one so eminent as Yale. I fear I shall never be able to make any adequate return for this high favour but I hope at least that a thankful heart will not fail me.

Very respectfully yours,
Edward Hitchcock

Saturday Oct. 3rd. The mail was closed an hour earlier than usual last Tuesday and I have been compelled to delay sending this till today. I am very glad to learn that Mr. Eaton has undertaken to write an account of the Southampton mine³⁵² and as to the Shutesbury spring, it is not of consequence. I have received more specimens of serpentine from Leyden and they are so much handsomer than former ones I should like to insert the following instead of the statement in my essay relating to this mineral.

‘Serpentine - found in Leyden in rolled masses. Some of the specimens admit a fine polish and the ground is handsomely variegated. It has not been noticed in situ.’

You may do as you thing best about inserting this. I have already troubled you too much in this way.

I trust you will excuse the slovenly manner in which this letter is written when I mention that my health is so poor I have been scarcely able to [word obscured] it at all.”

BS to EH, Box 3, folder 37

“New Haven December 11 1818.

My dear Sir,

On receiving yours of Sept. 28th I wrote to have the correction made in the section & 250 plates which were struck off afterwards are correct. I wrote also to Mr. Eastburn to procure some person to add the omitted lines with the pen, on the 1000 plates which had been struck off before. I trust it has been done. The lines were supposed to be mere shading which was the reason for the omission. The clause which you requested to have inserted respecting the perspective was added agreeably to your wishes. The maps have all been neatly & I trust correctly coloured & I hope will please you & the public as they do me.³⁵³

Some further notice of the Southampton lead mine would still be acceptable should it ever be convenient to you to make it, for, Mr. Eaton’s account embraces only the subsurfaces found in the level which they have carried into the hill and does not embrace any account of the present state of the concern in other respects. I would not however tax you with any effort which may be inconvenient to your health. Any observations of yours will however be acceptable & your botanical labours not less so than your mineralogical.

An apology is due to you for a mistake in sending you the common diploma when another was in preparation & has now been some weeks ready. It is committed to the care of Griswold & I trust will reach you safely. I am much gratified that this college has done any thing acceptable to your feelings & the more so as I do not regard the diploma as merely honorary, but on the contrary well merited.

On my return from New York I was very sorry to find I had missed of you [sic] in your late visit at this town. I did not know that you contemplated such a visit & hope should you do it again (which I trust you will) I shall not lose the pleasure of your visit a second time.

I have delivered to Griswold those minerals which I supposed you wish returned, with an opinion on the labels where one appeared to be desired. I must apologize for not having done it sooner but my avocations have been numerous.

I am much gratified with the account which you give of the impression made in your quarter by the first No. of the Journal. The second is ready to appear & I am expecting it every day to see it announced. As a friend to

³⁵¹ See above, Hitchcock’s letter of 10.16.17.

³⁵² Eaton, “Account of the strata perforated by, and of the minerals found in, the great adit [sic] to the Southampton lead mine,” *AJS*, I, 2 (1818): 136-39. Article signed “Southampton, Aug. 26, 1818.”

³⁵³ Hitchcock, “Remarks on the geology and mineralogy of a section of Massachusetts on Connecticut River, with a part of New-Hampshire and Vermont, by Edward Hitchcock, A.M., Principal of Deerfield Academy,” *AJS*, I, 2 (1818): 105-16. The article is signed “Deerfield, October, 1817.”

the work and its Editor you will be gratified to learn that the whole edition of No. 1 (1000 copies) is exhausted & the subscriptions increasing. We print 1500 copies of No. 2 & I shall soon reprint No. 1

I hope you & your friend & assistant [Orra White] who handles so delicate a pencil will favour us with something in Botany; we will have coloured engravings executed when desired.

I remain my dear sir with earnest wishes for further recovery of your health, truly yours,
B Silliman”

EH to Silliman³⁵⁴

“Deerfield, January 29, 1819

. . . . Some months since I left the Academy in this town, and am now studying theology as much as my health will permit. It is my wish and my intention to come to New Haven the ensuing spring, to prosecute this branch under the instruction of Professor Fitch.³⁵⁵ I saw him when I was at that place last fall, and have just written to him on the subject. I hope I shall not be disappointed in this calculation, for I have been confined almost all my life to this town by a variety of untoward circumstances, and hope that I am not insensible that I greatly need instruction superior to that which can be expected in an ordinary country town. One thing, which I confess is no small motive for inducing me to come to New Haven, is the hope that it may be consistent with the regulations of your College to permit me to attend the lectures of yourself and Professor Fisher.³⁵⁶ My eyes will not suffer me to attend closely to reading, and if I could have this privilege, it would be a great advantage as well as pleasure to me in my leisure hours. Pray, sir, do the laws of your College permit access to your lectures to one who is not an alumnus of it?”

BS to EH, Box 3, folder 37

“New Haven Feby. 6 1819

My dear sir,

Yours of the 19th January is before me with your communication & that of Dr. Williams. I beg leave through you to make my acknowledgments to him for his valuable communication as I do also to you for yours.

Both will appear in a future No. of the Journal.³⁵⁷ No. 3 is now in the Printer’s hands & No. 4 is so far arranged that it may not be in my power to insert them in that, but you may rely upon it that they shall appear as soon as practicable.

I am glad you are pleased with the execution of the map & I am sorry there was any omission of minerals. Your account of the disruption [action of frost] in Deerfield will appear in No. 3 with a handsome plate.³⁵⁸

I did not know you had changed your pursuits. I am pleased to hear that you will prosecute them here. The lectures of every description will be perfectly acceptable to you.

With my best respects to Dr. Williams & my kind regards to yourself, I remain, dear sir, your # servt.
B Silliman

Mr. Hitchcock

If any persons in your neighborhood failed to receive No. 1, I could wish to know it. A second edition of that number is in the press.”

BS to EH, Box 3, folder 37

“New Haven August 18 1820.

My dear sir,

You gave me license to take time to answer your favours of April & of June & you see I avail myself of your indulgence. Have you or Dr. Webster³⁵⁹ forwarded to Prof Cleaveland the notice of the Cumington Chromat

³⁵⁴ Original of this letter is lost. The following is taken in entirety from Fisher *Silliman*, vol. 2: 135.

³⁵⁵ Eleazar T. Fitch (1791-1871).

³⁵⁶ Alexander Metcalf Fisher (1794-1822) lectured on “musical temperament” at Yale; Hitchcock later taught music to his own children.

³⁵⁷ Williams, “Floral calendar kept at Deerfield, Massachusetts, with miscellaneous remarks,” *AJS* I, 4 (1819): 359-73, and Hitchcock, “Supplement to the ‘Remarks on the geology and mineralogy of a section of Massachusetts, on Connecticut River, &c’ contained in No. 2, Art. I, of this Journal,” *AJS* I, 4 (1819): 436-39.

³⁵⁸ “On a singular disruption of the ground, apparently by frost, in letters from Edward Hitchcock, A.M. Principal of Deerfield Academy,” *AJS* I, 3 (1819): 286-90.

[sic] of iron and the correction as to the silver at Westfield River; if not I hope it will be done that, at least, it may get into his appendix. Is there much of your manganese?

Your question as to the existence of the Verd antique antique marble in connexion with the Chromat certainly deserves attention & I hope you & others, who are favourably situated, will attend to the subject.

In your speculations as to the great granite range, I suppose you do not mean to suggest a doubt as to its appearance east of New Haven because it undoubtedly does appear east as well as west; it is found at our light house & prevails very much along the coast to Branford & even perhaps to New London and to Stonington.

I think you got off well between Moses and the divines: the latter I suspect, were willing enough to get rid of the subject. I have become still more convinced of the truth of the new views and I am satisfied they will ultimately become general among men who are at once acquainted with geology and disposed to reverence the scriptures. No mere divine, no mere critic in language can possibly be an adequate judge of the subject or deserve unqualified deference, however able in other respects.

I am so glad that the fifth no. of the Journal meets your approbation. As far as I can learn, it has been generally well received although the number distributed does not equal 400 copies instead 1200 which we sent around [sic] of the first volume; but the difference is that 800 out of the 1200 have paid no attention to the terms while those which we have now sent out are rather paid for in advance or contracted for in quantities by the bookseller.

I cannot say whether any have been sent far from Deerfield. The terms you will observe are in a word: payment for a volume in advance in the case of individual subscriptions; in the case of booksellers' contracts for quantities the usual discount & credit.

Your box of minerals for Dr. Torrey I will forward on their being sent to my care.³⁶⁰ Dr. Torrey's new mineral I have not yet received from him but suppose I have it from another quarter.

I have received through Professor Dewey³⁶¹ Col. Graves' account of the gelatinous meteor – what a pity it was not analyzed! I have received a very good collection from M. Brongniart & they are the more valuable because I have now adequate means of understanding what he means by particular terms.³⁶² Your memorandum as to the cylinders of snow I will insert in No. 6 which I am about beginning to compile.

I am at this time much engaged in constructing my new laboratory and have but just got out of my hands a little new work – a tour to Quebec & back which will in a few days be before the public.³⁶³ I would send it to you if I knew how & where. By the by I have used General Hoyt's name without his permission.³⁶⁴ I will thank you to apologize to him for me. I could not conveniently consult him in season & I supposed it would do him no discredit (vide the notice of the lake George battles.)

We have nothing new here, except what you will be glad to hear that there is a very considerable attention to religion in this place and in the college. I hear of nothing which should give solicitude as to its been productive of good.

The gentlemen of College are well. Mr. Fitch³⁶⁵ by the death of his wife's mother becomes a rich man. I shall always be happy to hear from you. My best respects to Dr. Williams & to General Hoyt.

³⁵⁹ John White Webster (1793-1850), professor of chemistry and geology at Harvard Medical College whom Hitchcock knew. Author of Webster 1826, but later best known for his sensational murder of George Parkman for which he was executed in 1850.

³⁶⁰ John Torrey (1797-1873), brilliant young New York botanist. Hitchcock began sending Torrey plants and mineral specimens in July, 1819. A manuscript list "Plants sent to Dr. Torrey 1820" is in EOH, Box 5, folder 23.

³⁶¹ "Account of a gelatinous meteor, by Rufus Graves, Esq., formerly lecturer on chemistry at Dartmouth College, (communicated by Professor Dewey)," AJS, vol 2, no. 2 (1820): 335-37. Chester Dewey (1784-1867), professor of mathematics and natural philosophy at Williams College with whom Hitchcock exchanged mineral specimens in 1819. Orra White Hitchcock later illustrated one of Dewey's articles in Silliman's journal (see Silliman to Hitchcock, 4.14.25).

³⁶² Alexandre Brongniart (1770-1847), French mineralogist and zoologist who collaborated with Georges Cuvier (1769-1832) in studies of the geology of the Paris region.

³⁶³ Silliman, *Remarks made, on a short tour, between Hartford and Quebec in the autumn of 1819* (New Haven 1819).

³⁶⁴ Epaphras Hoyt (1765-1850), Hitchcock's maternal uncle, and author of *Practical instructions for military officers, comprehending a concise system of military geometry . . .* (Greenfield MA, 1811), of an introduction to Rudolphus Dickinson's *Elements of geography* (Boston 1813), and of *Antiquarian researches comprising a history of the Indian wars in the country bordering Connecticut River . . .* (Greenfield MA, 1824).

³⁶⁵ Presumably Rev. Eleazar T. Fitch.

Yours very sincerely,
B Silliman”

EH to BS, Box 5, folder 12

“Deerfield 8th Nov. 1820.

Hon. Sir,

Dr. Webster of Boston told me the other day that through mistake he had forwarded a box of Haddam minerals to N. Haven which should have been sent to me, and that I had directed you to forward them to Mr. Pierce of N. York. The box was originally intended for me and if you have not yet sent them to N. York you will oblige me by retaining them until I can send for them.

I saw in Dr. Webster’s cabinet a box of minerals and a large box of books from Mr. Maclure for the Am. Geol. Society.³⁶⁶

I perceive by the Journals that you 2d No. of Vol. 2 of the Scient. Journal is out, but have not yet seen it. We wait for it impatiently.

In much haste, yours respectfully,
Edward Hitchcock”

BS to EH, Box 3, folder 37

[addressed to Conway] “New Haven February 14 1821.

My dear sir,

You have been so indulgent a creditor that you perceive you have got me into a habit of expecting 90 days at least & then you are paid not with interest but at so many shillings in the pound. Your favours of Nov. 8 & Octob. 10th have come up in their turn to be answered and I take a pleasure in acknowledging renewed proofs of your kindness. I am glad that the little ‘tour’ has afforded you any pleasure and I shall certainly preserve & make use of your remarks as to the sand stone in Greenfield whenever a second edition is printed which my publisher tells me is needed.

Do you observe that in your letter you use Wacke & Greywacke as synonymous? I doubt not you are aware of the difference & that, although similar in name they have no resemblance. As to Cleaveland’s definition of Greywacke – I agree with you that it is not Werner’s.³⁶⁷ Dr. Webster has written to me on this topic & I have expressed to him my conviction that we need a geological definition for the earlier fragmented rocks more extensive than any extant. I would have it embrace Werner’s Greywacke & also those equally early perhaps in some instances even earlier fragmented rocks which are most evidently & passably the mere ruins of primitive rocks broken down & cemented mechanically – such as those in your vicinity & I was highly gratified by marking the transition from the orthodox primitive, into the heterogeneous if not heterodox breccias & conglomerates of Northfield – Miller’s Falls – the falls near Gill &c.

I thank you very much for remembering the fish. I have received another interesting letter from Brongniart just returned from a geological tour into Italy & he is very desirous of more of our remains & is much interested about them. I shall send him the fish you gave me & will mention you as the discoverer & I will thank you to let the men persevere in exploring & I will pay them.³⁶⁸ I should like while they are fishing to have them catch enough for a dinner. You will see in No. 8 of the Journal (to be published I trust in May) a notice of Mr. Maclure’s splendid present to the Geological society. No. 7 is just published & I presume you will see it nearly as soon as this letter.

The box of minerals which Dr. Webster mentioned is still in our cabinet garnet & shall be reserved for you. Unfortunately I have mislaid the specimens of minerals which you sent and in the multitude of cares have forgotten where or what they are – perhaps I shall yet come across them. There is an able & favourable analysis of the first vo. of the Am. Journ. of Sci. just arrived from Germany. Brongniart writes me very favourably about it & Berzelius writes to me for it from Sweden; but it hardly bears its weight as to expence [sic]. It is however slowly improving [torn loss].

³⁶⁶ William Maclure (1763-1840), whose *Observations on the geology of the United States* (1809, reprinted 1817 and subsequently) gave him great prominence. Maclure was named president of the American Geological Society upon its founding in New Haven in September 1819. See Appendix A, following Part III of the introductory essay.

³⁶⁷ Abraham Gottlob Werner (1749-1817), famous German mineralogist, leader of “Neptunists” who traced Earth’s origins to primeval oceans and believed water to be the chief agent of geological change

³⁶⁸ Hitchcock had been unearthing fossilized fish along the Connecticut River near Sunderland and apparently gave some to Silliman. See EH to BS, 4.9.21.

The religious revival continues in [this] town & vicinity and in a degree in the College. In the town & College there have been considerably over 200 admitted to the communion this winter & I trust that good will come of it.

We are about building a new college as our numbers demand such an accommodation. I am told you are about being fixed at Conway. I hope you will let me hear from you when convenient & believe me, my dear sir, to be always with great respect & regards, very truly yours,

B. Silliman

P.S. Your thermometrical register which I have had two years went to the printers to go into the no. 7 but we could not get it in.³⁶⁹

EH to BS, Box 5, folder 12

“Deerfield 9th April 1821

Prof. Silliman Sir,

I had almost despaired of prevailing upon any one by the open ground to engage in digging fish impressions. But at length I have just secured a large supply, perhaps 50 or 60 specimens, most of them however mutilated. And I have a chance of sending tomorrow morning to Hartford so must endeavour to put up a box. Although it is late at night & therefore I fear I shall make some blunder you will perceive the very distinct species of the fish & I shall put up specimens of some other organic beings I know not what & also of the rocks above and below the petrifications. On the other page you will find a list. You must not blame me for not stating the expence for the men employed here have not yet presented their bill to me. I shall not send a great number of impressions at this time as I fear they will be injured & fear also that they will not reach you. I shall take the liberty to direct them to your friend Mr. Wadsworth of Hartford because I know of no method to forward them from there.

I shall not be able to complete my additional observations on the Geology of this region for your next No. of the Journal – I have written a description of the view from Mt. Holyoke – as it appears to a connoisseur of natural scenery – to a geologist & to a philanthropist. And I hardly know whether such a description would be proper for your Journal – I think however I had better omit sending it at present.

If possible, Sir, I hope you will get the names of the fish impressions & other remains & rocks from M. Brongniart – And in particular be so good as to request his opinion whether these rocks belong to the secondary or transition class. This is a question that still remains undecided in my mind.

I have other things to say but time will not permit.

Very respectfully Sir, your humble servant, Edward Hitchcock”

On separate sheet: “Organic Impressions sent Mr. Silliman April 1821.”

No. 1. Pudding Stone or Grey Wacke Slate from the bottom of Ct. River.

No. 2. Slate with one species of fish.

No. 3. Same rock, another species of fish.

No. 4. Same rock Fish Impression, 2 fish lying above each other.

No. 5. Fish Impression, same rock.

No. 6. D°, D°

-- 7. Organic Remains in same rock.

-- 8. D°, D°, D°

-- 9. Specimen of # slate 200 feet above the fish.

-- 10. D° Brown slate 300 feet above the fish.

-- 11. D°, D°, D°, with vegetable or animal #.

-- 12. Vegetable remains in the same general formation (Falls in Gill)”

-- 13. Slate 300 feet above the fish containing a clam shell?”

BS to EH, Box 3, folder 37

[addressed to Deerfield] “New Haven April 21st 1821.

My dear sir,

A pretty serious indisposition and many calls on what little health I have had left for six weeks passed must plead my excuse for omitting to answer your very kind favour respecting the fish. I am under very great obligations to you for your kindness and attention & I must beg to be informed as soon as may be what is the expence. I will remit the money to you promptly or pay it here if you have occasion to pay any here. I think the

³⁶⁹ Silliman published Hitchcock’s “Abstract of a meteorological journal kept at Deerfield, (Mass.) beginning March, 1817, and ending November, 1818” in *AJS* 4, 2 (1822): 333-37.

fish &c should by all means come by water as they would unless very carefully packed be much injured by a land journey. I will thank you to give a written memorandum to the boatman or to save you the trouble of writing it, I will annex one which you will be so kind as to tear off & hand or commit to the boatman. As I know from experience that some of those people are very unreasonable in their demands, I should be obliged (if you can do it without too much trouble) by having the fare paid at first & inscribed as paid on the box & let me know the amount with the other expence. I wish very much to get the box soon as I shall forthwith make up one for Mr. Brongniart. I will not fail to ask him the questions that you desire. I shall be glad of all the papers you mention. They will be in season for no 9. No. 8 is already more than half printed. Pray let me see your Mt Holyoke piece & I will be very candid with you about it, but dare say it will do very well.³⁷⁰

Your notice of temperature has been again in the printer's hands for this No. but for want of room I am afraid I must still postpone it.

I have inserted or shall insert a notice of the fish & your catalogue as it was calculated to be very instructive. I hope you will pardon me the liberty I am taking.³⁷¹

With great regard & esteem I remain your very obt. & obliged

B Silliman

[P.S.] My respects to Genl. Hoyt to whom I shall write by this mail or the next. My regards to Dr. Williams."

BS to EH, Box 3, folder 37

[addressed to Conway] "New Haven July 27 1821.

My dear sir,

My absence till nearly the middle of June on a journey for my health & professional duties since my return engaging what little vigor I have left, must be my apology for not sooner acknowledging your favours of May 9th and 23rd.

The box of Ichthyolites I duly received and am very much obliged to you for your care & attention about them. I beg you will never think of apologizing for mentioning any expences you may incur on my account unless you would prevent my repeating any applications to you in future.

I will see that vol. 4 of the Journal is forwarded to you as the numbers come out.

The remaining Ichthyolites I should be glad to receive when convenient & should there at any future time be discovered any specimens where the fish is entire I will make the people who find them any reasonable compensation for them.

I forwarded to you a few days ago two of the German journals by mail. I will occasionally transmit you other Journals, agreeably to your request if you will say what ones & in what manner. I receive about half a dozen Parisian Journals, three I am entitled to from London, two hence began to come & one more is expected besides German Journals.

Your hint respecting my health is kind & considerate. I have long been sensible that I have too much upon me, but I see no release till the final one.

I am happy to hear of your double settlement & trust your colleague has joined you ere this.

With much esteem I remain dear sir your very obt. & obligd. servt., B Silliman"

[In EH hand on outside fold, a list of nine stone types.]

EH to BS, Box 5, folder 12

"Conway 6th August 1821.

Prof Silliman, Sir,

It was gratifying to receive your kind letter of 27th July & to learn that your health is no poorer, though I sincerely lament that it [sic] at all impaired. Pray Sir, what is your complaint? For I could never learn except that your lungs were affected. That 'final release' of which you speak I earnestly pray may long be delayed.

I received two German Journals from you and thank you for your kind intentions. But really Sir, I am wholly ignorant of that language & know of nobody in this region who is acquainted with it, so that they remain as yet 'a sealed book.' When I suggested whether it would be possible for me to get sight of any of the European Journals I was rather careless by not mentioning this fact. But I had the English Journals in my mind, though if you felt disposed to send a French one occasionally I should like it for though neither do I read that language yet

³⁷⁰ Hitchcock's romantic view from Mount Holyoke appeared in AJS 7, 1 (1824): 5-9, in the third and final installment of Hitchcock 1823, "Sketch."

³⁷¹ Silliman published a very short "notice" of Hitchcock's discovery of fossil fish in Sunderland in AJS 3, 1 (1821): 222.

my Mrs. Colleague (whom I anticipated in my last & who has since joined me) will be able to be my interpreter. And now, Sir, if you could without inconvenience occasionally send me by mail one of these Journals it would much gratify me as I am shut out mostly from the scientific world, yet I want a loop hole through which I can look sometimes & see what they are about. But in what way am I to repay you for the sending of these Journals? Unless some arrangement can be made on this subject I would not have you send. And furthermore, do you wish to have them returned by mail or would it answer if I should send them every few months by some of the students from this region, say Baker or Webster of Amherst. And perhaps it would save you some trouble were I to get them to call upon you whenever they come this way to see if you have any Journals to send.

Will there be any thing peculiarly interesting at Commencement? Do you expect a meeting of the Geological Society?³⁷² & what members will be present? & will there be any important business? I am doubting whether to attempt a journey to N. Haven at that time & want a few more months to turn the scale in favor of going.

I have Sir a proposal to make which perhaps you may deem chimerical or improper. It is that we should unite in forming a Geological map of the secondary region from N. Haven to Vermont. This is an interesting region and it appears to me a correct map with an accompanying memoir exhibiting the whole of this region at one view & describing minutely its geology & mineralogy must be serviceable to science. I would have every rock of consequence marked on such a map occupying (as far as it can be determined) the same relative space as it does in fact occupy in this region, and each one be differently coloured if we can find colours enough. For I am sick of referring our rocks to primitive, transition & secondary & alluvial & making only four colours. I could have this map extend further north than in my map in Vol. 1 of the Journal, perhaps a dozen miles so as to reach the northern limits of the Argillite. This would make the map at least 140 miles in length. And as to the width it would be necessary to embrace considerable of the primitive especially at the two extremities because the secondary becomes narrower. I am already nearly prepared to mark out the northern half of this map on which there are at least ten different rocks or formations. As to the execution of the map, the same person who made my former ones is now my colleague & will undertake again if wished. The accompanying descriptions of the geology & mineralogy I would have full & definite, though not put down with as much panache as those in the map of the Messrs. Davids [?]. I should like also to describe the most interesting plants found in these different formations especially the Lichens, mosses and Fungi, the latter which have not been given at all for this part of N. England & a large number of which I flatter myself I shall soon be able to give. Such a map & memoir if executed I could wish might be inserted in the Journal though if well done it would perhaps occupy too much space.

This, Sir, is my proposal, and now if it interferes with any of your plans or if you have any other objections to it, let it die unattempted. I am at present much occupied as I have but poor health & perhaps the most extensive parish in Massachusetts to oversee, it being in extent 12 miles by 7. And besides a revival of religion appears to be commencing among us & this imposes severe duties. But I have reserved five weeks to myself in the year and a part of these I mean to devote to geology as I know of nothing better fitted to merit my vigor. And I am confident if my life is spent that I must take some such rest the ensuing autumn. If you should conclude to engage in the proposed plan, would not September or October be the best time for carrying it into execution. I suppose you already have the south part of the secondary region ready for a map on the plan above mentioned. And probably the part that will need most examination is that between Hartford & Springfield. And here I can hardly avoid mentioning a belief that there is a strip on the eastern part of this secondary region which may be denominated the Fish [?] Formation that is different from the Old Red Sandstone & that this is divided from the Sandstone most of the distance from Vermont to Middletown by Greenstone. However, more of this hereafter.

I attend more to botany this season than geology, because plants can be gathered everywhere & geology or mineralogy requires more travel. I am getting paintings executed of many of the Fungi because they cannot be preserved except in pickle.³⁷³

If your occupations or health is such that you cannot conveniently answer this before commencement, please not to incommode yourself.

Respectfully Sir yours &c,
Edward Hitchcock"

³⁷² Hitchcock was named one of three secretaries of the American Geological Society when it was founded in New Haven in September 1819.

³⁷³ Orra White Hitchcock painted more than 100 mushrooms in an album *Fungi selecti picti* now in the Smith College Archives. Edward numbered and entitled the album's mushrooms and separately wrote a thorough catalogue of them. See Herbert and D'Arienzo 2011, cats. 31 and 32.

BS to EH, Box 3, folder 37

“NH. Aug. 11 1821.

My dear sir,

You had better instruct the young men you mention to call on me for the Journals & then it will not be forgotten. I thought you asked in one of your letters for German journals. You can return them.

I cannot say who will be at the meeting of the G. Soc^y. I hope you will come & I trust we can make out a quorum for the appointments.

I like your plan for the report of the secondary region – it is what I have long wished & contemplated but am satisfied I can never do it. I shall be very much satisfied to have it in your hands. I may aid you somewhat at this end but can promise nothing owing to the precarious state of my health. It was at first an acute pulmonary attack of the influenza class but is now little more than a general & nervous debility. I think however I am mending. You will excuse my brevity. You need say nothing about compensation for the reading of the Journals. You are more than welcome. They may be somewhat old before they come into your hands because I cannot always myself examine them under some weeks.

I have various things to suggest to you as to the survey but will defer them till commencement.

With much esteem, truly yours,

B Silliman”

BS to EH, Box 3, folder 37

“New Haven Sept. 20 1821.

Dear sir,

By some mistake your letter of 3^d of Sept^r did not reach me till after commencement. Griswold I believe forgot to mention the subject of the Journals & I forgot it till he was gone. I must avail myself of some other opportunity. Should you find one I hope you will send [sic]. Griswold mentioned the box to me but he did not send it to the cabinet as proposed & hence not yet seen it but shall doubtless find it soon. I return you many thanks for your attention to the subject & I will see the specimens disposed of agreeably to your wishes. We missed you at our annual meeting of the G. S. which was fuller than any former one. You can inform Dr. Allen that he was elected a member. He will soon hear it from the secretary. I should be very glad to see you here & hope you will come but I wish it might be within 15 or 18 days & as early in that time as practicable because it is very possible I may be absent during the 2 or 3 last weeks of the vacation. I will do every thing in my power to forward the object in view & I hope you will not relinquish it. The ferruginous acid [?] of titanium is commonly crystalized. Such was what you formerly send me from Leyden. You must intend I should imagine some other form of titanium. As to specimens when you come I will endeavor to look out some for you.

I will thank you to write whether I may expect you & when.

Yours very truly, BS”

BS to EH, Box 3, folder 38

“NH Jany. 7, 1822.

My dear sir,

I send you the books and ms. you mentioned except one vol. of the G.S. Transactions viz vol. 4 which I cannot find at this moment. It is somehow mislaid. I need not say that you will preserve the books with great care and return them when convenient.

I send you also one of your maps complete and a print of the Ichthyolites &c. the references to the pages &c are still to be added. I send also a finished proof of the first part of your memoir. All the errata which I observed I have noticed at the end. The manuscript catalogue you will let me have by the first of March. I have no time to enlarge it being a moment of great occupation but remain D^r Sir with great respect,

Your friend & Serv^t,

B Silliman”

BS to EH, Box 3, folder 38

“New Haven May 8th 1822.

My dear sir,

I duly received your favour of March 25th covering a statement of Mr. Williams' case. It is interesting & I had no hesitation in ordering it for the current No. which will be out this month.³⁷⁴ I have had the picture engraved; it adds much to the interest of the piece & I would by no means have had it omitted. I doubt however whether many other trousers have had the honour of sitting for their own picture. I think you have assigned the true reason for the preservation of Mr. Williams' life.

I shall be glad to receive your communications for the Journal whenever they are ready. I wish you would obtain from Dr. Cooley the notice of the fluete, agates &c.³⁷⁵ I perceive that Dr. Cooper is the same man about whom you argue but I never saw his lucubrations on the consciousness &c of plants. I have not heard any thing from Mr. Brongniart respecting the Sunderland fish but will inform you when I do.

I hope you will not abandon the geological project. Such a map would be interesting & valuable. I may perhaps aid you in that part of the ranges which lies this way.

I am much gratified that you & Gen^l Hoyt think so favourably of the Journal. You have contributed to its respectability & I am always happy to hear from you.

I will endeavor to send you some foreign Journals after I have found time (that however may not be very soon) to look them through. I was mortified when your messenger called that I could not find your box of minerals. I have forgotten what it was. Cannot you mention something that will reveal it to my recollection? I hope within a few weeks to make a general overhaul among my minerals & then to find it if not before.

What has become of Gen Hoyt's book?³⁷⁶ I am desirous of seeing it. My respects to him when you see him.

I remain my dear sir very cordially yours,
B Silliman"

EH to BS, Box 5, folder 12

[Letter headed "Conway," but on envelope-fold, written in EH hand "Deerfield M. July 22. Paid 12 1/2."]
"Conway 23d July 1822.

Prof. Silliman, Dear Sir,

As I threatened you I now trouble you with a map asking you & Dr. Percival's corrections. I have been obliged to make it out in a hurry & yet I do not know but the rocks are put down as accurately as I am able.

Since I saw you I have been pursuing my object of finding the contemplated geological map. After returning to Conway from N. Haven I returned as far as Suffield & I have been [sic] one or two other trips for the same purpose. There are still some spots I wish much to visit especially near [torn loss]. I think it a lucky thought that I den[torn loss] certain rocks that have long perplexed me [torn loss] 'Coal Formation.' I think there can be no doubt but it is that Formation and not graywacke slate. I am pressing the business of the map in order if providence spares my life to finish it so as to present it at the Commencement to the G. Society when I am now calculating to visit N. Haven.

I have been deliberating much whether it be best to put down the names of towns on the map or to annex a list. You partly gave your opinion on the point but I ask you now to decide it. For I will leave it to your judgment since you mentioned the engraving of the map should not cost me any thing. I feel as if it would be much better to put them on. It will be necessary to put on as many as one hundred if all are put down that are coloured. I have much to say & to ask but am in great haste this morning being on my way to take a section of the coal Formation in this vicinity.

Yours respectfully,
E. Hitchcock."

BS to EH, Box 3, folder 38

[Map enclosed, drawn and colored by Orra White and Edward Hitchcock, corrected by Benjamin Silliman and James G. Percival]"New Haven Aug 2d 1822.

³⁷⁴ Hitchcock, "Wet or damp clothes, good conductors of lightning. Illustrated in the case of John Williams Esq. of Conway, Massachusetts," *AJS* 5, 1 (1822): 121-25. Hitchcock recounts the story of a man struck by lightning who survived, though injured, because his wet clothing conducted the charge to the ground. Silliman reproduced drawings of the man's badly scorched clothes.

³⁷⁵ Dennis Cooley (1789-1860), physician and botanist of Deerfield who collaborated closely with Hitchcock until he moved to Georgia in 1822.

³⁷⁶ The book in question is probably Rodolphus Dickinson, *Elements of geography* (Boston, 1813), with an extensive introduction by Hoyt.

My dear sir,

I now return you the map with a few corrections by Dr. Percival³⁷⁷ & myself; and first for my own:

1. The primitive trap is carried too far W. I have put it down [torn loss] thus it commences very soon after leaving the alluvion of N Haven plain.
2. I think you have omitted Mt. Carmel, that remarkable knob. The most distinct Greenstone # visible from N Haven at the distance of 9 miles N. It is continued towards Wallingford in a range of Greenstone hills of several miles. When you passed through them going to Cheshire you left it on your right, the road passing directly at its foot. I have put it down Mr. Carmel Range* [at foot of page:] *There also Greenstone hills farther south of Mt. Carmel. I have put them down (GrSt) thus.
3. The coal formation is distinct, very distinct W of Middletown & so on down to Durham & as high up as opposite Berlin East.
4. The same in Southington immediately W of the great Greenstone range there & for several miles up & down; it is no where more distinct.
5. Also in Somers & Ellington (see Am. Journal vol. 3 pa 248). I have laid it down by guess for I know not the exact spot.

Dr. Percival

You will observe the Doctor's corrections partly put down on your map but more fully delineated in a separate sketch on the second page where you will observe the greenstone is more in detached portions than in continued ranges & this Dr. Percival thinks is to a considerable extent, the fact generally & even where it appears to one, in front of it, like a continuous wall, it is usually formed of several walls, one lapping on, by the other, & in such a manner, that the broken ends are not always visible. [here crude elongated ovals in ink] [##] however that I mean to delineate any particular spot.

In Dr. Percival's sketch of the Greenstone which runs E from Saltonstal's pond, the ridge is too continuous in the eastern part & it stops too short. It should continue farther E & S so as to come close to the Granite where we saw it at Branford. I think your idea of a coal formation is a good one. I extracted you from a dilemma.

I think it best to put all the names down on the MS Map & I trust we shall be able to put them all upon the engraved one but in any event, we can annex a list if we find it will cost too much to engrave fully, putting down at least the initial & enough to render it intelligible as E.H. Bran. Southⁿ &c.

I hope you will be ready by commencement & if I can aid you any farther prey write &c dear sir.

Yours with very great regard,
B Silliman."

[Separate sheet. On recto: Corrections in watercolor and ink of East Haven area]. "I have been over this since I saw you. James G. Percival." [Balance of recto in EH hand:]

"Professor Silliman & Dr. Percival will oblige E. Hitchcock by correcting this map [overleaf] whenever they perceive it to be erroneous. And if they can add any thing to it on the east it will be very acceptable. It will not be necessary in making alterations to attempt putting on colours but only to draw the outlines with a pen. By the 'Coal Formation' I mean those secondary slate sandstones, shale, & what some have called graywacke which are distinct from the old red sandstone. The hornblende slate too is an anomalous rock & I put it down merely to show that such a rock exists somewhere in the vicinity. Dr. Percival expressed to me an opinion that Cheshire, Southington &c are alluvial. After examining those towns I have put them down chiefly secondary. He mentioned also a peculiar spot in Cheshire or Woodbridge where the succession of rocks was very manifest & instructive. I could not find those hills. If he feels disposed to give a short statement of that spot I will thank him. Please to return the map by mail as soon as convenient."

[Verso: Map in ink and watercolor, with color code given for each kind of rock. Notations in EH hand. A very handsome ms. sheet!]

EH to BS, Box 5, folder 12

"Conway 22d Set. 1822.

Dear Sir,

I am sorry to trouble you again so soon but I find I have neglected some enquiries in relation to the geological memoir. I forget whether you wished the map[for the next number of your Journal, though I think you

³⁷⁷ James G. Percival (1795-1856), student of Silliman's, poet, physician and writer who eventually turned to geology.

said you did. If you do not I shall continue as far as possible to go on correcting the boundaries of the formation to which you know on such a map there is scarcely no end. I hope to be able to finish the geological part so as to send it with the map at the close of your vacation provided you wish it for the next No. I shall not be able to complete the rest so soon. My health is such I cannot confine myself to study much more than a quarter of the time & a great part of this moiety is taken up with sermon writing.

I want your opinion also in regard to the botanical notices of which I read the society a specimen.³⁷⁸ If such notices would be valuable I would introduce very many of them and perhaps a few similar testaceological notices.

And as to those drawings of the Ichthyolites I did not ask you whether it would be best to have them engraved, though you said nothing to the contrary. But that drawing of the Fasciculate, is it worth the while to annex that? I hope you will be free in advising.

I forgot to call on Mr. Whitney³⁷⁹ to enquire about the copper mines as you mentioned. Should you get time just to mention the subject to him it would oblige me. What I want to know where there are veins of this metal north of N. Haven, and also if practicable to have their situations.

Would not a few copies of the proposed sketch if bound separate from the Journal with a title page sell at the bookstores? I want your advice (if it will not interfere with the Journal) whether I had better employ the printers to strike me off say 100 additional copies. I should like to have a few copies scattered along the river to excite a spirit of enquiry: but if there is little probability of disposing of them I had better save my money & my credit.

As to having my piece appear in the next No. of the Journal, on many accounts I should like to have it deferred even for some time. But one circumstance which I mention in confidence rather draws the other way. Mr. T. Nuttall is now in this vicinity exploring the country minutely and it would be a little mortifying if the facts I have been collecting should appear in Philadelphia first, although the greater accuracy of this excellent naturalist ought perhaps to make me willing to have this local pride subdued.³⁸⁰

On Thanksgiving Day I sometimes preach a kind of natural history sermon, a specimen of which you may see by looking into the Christian Spectator for July, the first article.

Yours sincerely & respectfully,
Edward Hitchcock”

EH to BS, Box 5, folder 12

[envelope-fold labeled “by Rev. Mr. Bonny,” i.e., instead of being franked] “Conway 28th September 1822.
Prof. Silliman, Sir,

I shall be prevented visiting N. Haven within the period of 15 or 18 days which you mention in your letter of the 20th. The religious attention in this place is so much that I dare not in conscience leave the parish so long as I am able to keep about. I do not yet give up the idea of taking a geological tour this autumn, but it must depend upon the state of my health & the state of religion among us. For when the Lord appears to be preparing a harvest of souls we reapers must gather them in. I have no hope of getting away short of a month.

The mistake about the letters & pamphlets accompanying the box of Ichthyolites was made by some one at this end of the [torn loss] & Griswold is entirely free from fearing he did not carry them.

I cannot find either in Cleaveland or Rees Cyclopedia³⁸¹ that the ferruginous oxide of titanium (Titanic oxide ferrifere Haüy) ever crystalizes or that it has ever been found in this country excepting the variety ##. That from Leyden must be the red oxide of titanium (R#tile Jameson) and the specimen I sent you from Brattleborough if titanium must be a different species. Prof. Dewey as I formerly stated suggests that it may [sic] the ferruginous oxide.

I have just discovered a locality of the red oxide of titanium within two miles of my house & hope I shall be able to obtain quantum sufficat.

Is it not nearly time for another No. of the Journal of Science? Or is your health such that it must be deferred?

³⁷⁸ In summer 1822 in New Haven, to judge from context of letter of July 23.

³⁷⁹ Eli Whitney (1765-1825), Silliman's lifelong friend.

³⁸⁰ Thomas Nuttall (1786-1859), English botanist and zoologist who worked in the US from 1808 to 1841. Both Silliman and Hitchcock knew his *Genera of North American plants* (1818), and Hitchcock met him in 1821 or 1822.

³⁸¹ Abraham Rees (1743-1825), *The cyclopedia, or universal dictionary of arts, sciences, and literature*, 6 vols. (Philadelphia and New York, 1810-1824).

In haste very respectfully your humble servant,
Edward Hitchcock”

BS to EH, Box 3, folder 38
“New Haven Octob. 2d 1822

My dear sir,

I should wish you to be governed solely by your own convenience & by the exigencies of the undertaking, as to the time when the geological map & account shall appear. By all means make it as perfect as possible & I will cheerfully await your convenience. I think there will be matter enough for the next No. in that department without your memoir, but I shall consider this as entitled to a place among the first, whenever it is ready.

As to the botanical notices. I would by all means preserve & publish them in some form or another. If you prefer it I should not object to their being inserted in their geographical or geological connexion. I would however suggest the idea of a separate paper in which they should be embodied & then they might be inserted under the Botany. This would also shorten the other account. Perhaps both methods might be combined by just mentioning the plants where they occur & then referring to the fuller account under the Botany. The testaceological notices should certainly be introduced in the places where they belong.

I wish you to send me the drawings of the Ichthyolites & of the fasciculate, the former certainly & I think the latter I should introduce.

Mr. Whitney is, at present confined to a bed of sickness (I greatly fear his last one). Should a proper opportunity occur I will ask him the questions as I visit him frequently. . . .

I think it probably that some copies of your geology of the Trap Region would sell. At any rate it would cost very little to strike them off & the cost of the paper would be no great affair. You would probably wish also to send some abroad & to your friends in different quarters. . . .

As to Mr. Nuttall, suppose you were to communicate with him, and have an understanding that he shall not publish till your piece is out. Every thing that I have seen in him has been fair & manly. You will however recollect that Dr. Baldwin preferred an accusation against him in the Journal Vol I pa 355 & 357 to which he has not replied nor has he ever mentioned the subject to me.³⁸²

I have read your discourse with much pleasure & instruction & have given it to my daughter to read. I hope you will give us more such physico-theologico disquisitions.

I have just received from Mr. William Phillips of London & Prof. Conybeare of Oxford the first part of a joint work of theirs, a thick finely presented elaborate octavo with grand coloured sections of England. It is both an elementary & local geological treatise & should you wish to see the latest & the highest style of such performances I must send it to you as soon as I have perused it.³⁸³

I have this morning a long letter from our Pres^t Maclure with a geological communication for the Journal & the annunciation of various things sent out for the society, among others, the last volume of the Geological Transactions of London. I know not whether you looked over these Transactions. They are very valuable & full of coloured prints, maps, views, sections, &c.

With great regard & esteem, very truly your friend,
B Silliman”

EH to BS, Box 5, folder 12
“Conway 17th October 1822.

Dear Sir,

I have concluded upon the whole to forward the Geological Map for the next No. of the Journal if convenient, together with so much of the accompanying essay as is read. The whole of the geological part ought I suppose to be inserted together. That is all that is necessary to explain the map & give a description of the rocks coloured on it. There are fifteen of these. Eleven are described in the part of the essay I send and the remaining four I shall forward by mail as soon as completed so that they shall be in your hands in season for the next No., say by the middle of Nov. & earlier if possible, though I suppose that will be seasonably enough. The remaining

³⁸² “An account of two North American species of *Rottböllia*, discovered on the sea-coast in the state of Georgia, by Dr. William Baldwin, of Philadelphia,” *AJS* 1, 4 (1819): 355-59. Footnote, p. 355: “Mr. Nuttall will excuse me for retaining *my own specific name*. His knowledge of this plant was derived from my Herbarium. . .” Footnote, p. 357: “This is the specific name found in my Herbarium by Mr. Nuttall . . .”

³⁸³ Hitchcock reviewed Conybeare and Phillips 1822 anonymously in *AJS* 7, 1 (1824: 204-240).

four rocks to be described viz. old red sandstone, secondary greenstone, coal formation & alluvion are very important and their description will be more extensive than any four which I send so that probably they will require nearly as much space as the eleven which I send. I suspect however that somewhat more than half of the geological part is now sent. You may think me very long in my descriptions but I have put down no more than I thought essential to a good understanding of our geology. If you think any part of the essay to be superfluous I here give you liberty to strike it out without consulting me. The botanical notices will not in the whole occupy more than one or two pages, yet if you think it best to dispense with them, I shall not object. I think however that a particular communication on that subject will not be advisable for me at present except the catalogue by Dr. Cooley & myself which I shall also forward by mail ere long.

I suppose of course that when the map is engraved you will send the first copy to me by mail to colour. I depend upon this because I may ere that wish to make some alterations & additions in the northern part as I think of taking a tour of another 100 miles for this purpose if possible. You need not enclose the original map to me along with the uncoloured copy for Mrs. H. has copied it lest the original might be lost in sending by mail.

The line between N. Haven & Milford has been completely lost by making corrections of the painting & I have not the original map before me at this time from which I could replace it. Before you return the engraved copy however I shall forward it if that will not be too late for such a correction. If it will be, I shall have to depend on your goodness to insert it.

I have added another sketch to the drawings exhibiting the dislocation of granite veins in sienite. I think you will not hesitate to admit it when you read a description of it. It can be reduced & inserted on the same plate with some of the organic remains. But I should say these ought not to be reduced as they are now the natural size unless the scale of reduction be particularly mentioned. All the drawings except for the Fasciculate belong to the geology & ought therefore to accompany it in the same No. If this be inconvenient however, I see no great harm if some of them be omitted till the subsequent No.

I think the geology will form much the largest part of my essay, & if this is too long for some No. of the Journal perhaps it will be best not to have the whole inserted: though I should regret to have it divided and I do not yet know how extensive the miscellaneous part will be.

I shall wish to get some copies struck off to bind separate from the Journal -- perhaps 100. But I suppose it will not be necessary for me to say any thing on the subject to Mr. Converse this month yet when I hope to be able to determine something more definite in regard to the extent of the thing.

I have received your favour of the 2^o instant [Oct. 2] for which I thank you. It would give me much pleasure to see the work of Phillips & Coneybeare [sic] when you can spare it. I want also to see very much that book on Fungi (I forget the author) which Prof. Maclure sent the Geol. Society if it be consistent to send it to me.

I did not mean to insinuate that Mr. Nuttall would be guilty of any thing dishonourable but only that he might publish the facts he is collecting before mine should appear & it might seem that I had taken from him. I feel it is to be a delicate point to request him not to publish till I do & therefore think I shall be silent although I told him I exhibited my map to the Geolog. Society.

Dr. Cooley has left me to finish a Catalogue of Deerfield Plants which he says you expect for the next No. of the Journal. I shall forward it as soon as possible by mail after having condensed it as much as possible & I am inclined to think when Dr. Ives sees it he will think it worth inserting.³⁸⁴ Dr. Cooley will call on you in a few days probably on his way to Georgia. If you could introduce him as a botanist to any one of that character at the south it might be of great service to him as he goes to seek his fortune.³⁸⁵

Yours respectfully & sincerely but geologically almost worn out at midnight,
Edward Hitchcock"

BS to EH, Box 3, folder 38

"NH Octob. 27, 1822.

My dear sir,

I have rec^d yours of the 17th with the map & description. Both do you much honour & I presume the map owes its delicacy & beauty to a hand more delicate than yours or mine [Orra White Hitchcock's]. In the tablet of

³⁸⁴ Dr. Eli Ives (1779-1861) of Yale's Medical College, learned in medical botany.

³⁸⁵ This ended Hitchcock's collaboration with Cooley. The catalogue of native plants on which they collaborated was more than once proposed to Silliman and then withdrawn. It was finally published in 1829 under Hitchcock's name (he much enlarged it after 1822): Hitchcock 1929, *Catalogue*. Hitchcock thanked his "early coadjutors" Williams and Cooley.

colours a perchance [?] omitted to put down the brown for the coal formation. It is left white in the tablet although it is coloured in the map.

What you have sent of the memoir will make nearly 40 pages of the Journal; if I understand you correctly there will be nearly as much more of the geological part, say 35 printed pages = 75. The geol. & mineral. department of the Journal has varied from 35 to 85 or 90 pages per no. I have now on hand about 30 pages, most of which is promised for the next no; this with yours will make about 100 pages, that is, half the no. I hardly think it would answer to go beyond this as the lovers of the other branches might complain. I see then no way but to divide your whole production into two parts. Part I, I will endeavour to insert entire in this no. viz the whole of the Geology with all the drawings except the fasciculate. Part II, that is the mineralogy & miscellanies will come in the next no. but both will be in one Vol. It can be mentioned that the whole was communicated at once & you can have your printed copies of both so arranged as to stick them together in one pamphlet.

The Botanical part had better remain where it is, but I foresee that there will be typographical errors in that part unless Mrs. Hitchcock will take the trouble to copy those parts again in a hand that cannot be misread, for our botanical Doctors are too busy to be always found & always at command when needed to aid me in correcting proof. If the MS is perfectly plain (which is not always the case with you and me) I can then rely on myself.

I will endeavour to send you that work on fungi when I have an opportunity. You are aware it is in German but there is a Latin translation, column by column.

I will send you the earliest copy of the map that I can obtain & I will put it (the MS) into the engraver's hands this afternoon.

I wish you would forward the catalogue of plants as early as possible that I may see how much room it will occupy. I have one now lying by besides another botanical paper & Mr. Schweinitz has intimated that he shall send some papers.³⁸⁶ I will do any thing in my power for Dr. Cooley & remain with great regard truly your obligd. friend & sevt.,

B Silliman"

[P.S.] "My respects to Mrs. Hitchcock whom I cannot but regard as a coadjutor."

EH to BS, Box 5, folder 12

"Conway 6th Nov. 1822"

Dear Sir,

By Rev. Mr. Fisher of N. Jersey I found the remainder of the geological part of my Sketch. It is paged to avoid mistakes.

The description of a new species of Botrychium on the last page I intend for a separate communication, the drawing belonging to which I enclose in this letter.³⁸⁷ I wish you would if you please show it to Dr. Ives to whom I showed a specimen of the plant last summer. Mr. Nuttall says it is a new species. If you approve of it can you spare a half page of the next No. of the Journal for it? You know that in these cases dispatch seems requisite to avoid being anticipated.

The Catalogue of Deerfield Plants I could not possibly get ready to forward by this conveyance. I shall endeavor to put it into the mail next week.

I believe you will think I mean to inundate [sic] you with communications. I know not how it happens that they should happen to be all muddled together but so it is. And unless you serve me as you did Rafinesque³⁸⁸—viz send back my papers—I fear I shall still continue to trouble you as I have some other communications in progress.

You will oblige me by asking Mr. Converse for how much he will deliver me 75 copies of the Geological Sketch with the map & other plates provided that already sent constitute two thirds of it? And also for how much he will deliver 100? If he can drop me a line before publishing to let me know his terms I shall be glad: but if it is too late for that I wish you now engage him to strike off 60 additional copies besides those inserted in the Journal, for which I will pay him a reasonable compensation. In striking them off I wish him to omit the heading in the Journal & merely put down

³⁸⁶ Lewis David de Schweinitz (1780-1834), American botanist and major mycologist

³⁸⁷ Hitchcock 1823, "Description": 103-94. Plate 8 includes one hand-colored engraving by Amos Doolittle of the Botrychium Simplex, from a drawing by Orra. Doolittle (1854-1832) was the premier engraver and lithographer in New Haven.

³⁸⁸ Constantine Samuel Rafinesque (1783-1840), eccentric polymath of mixed European origins, settled in the US in 1815 where he pursued botany, zoology, meteorology and other sciences, especially known as seeker of new plants and animals.

A
 Sketch of the Geology, Mineralogy &c
 of
 the Connecticut

somewhat in this form. And I wish he would pay a little attention to have the ending of that printing of the sketch inserted in the next No. so that it will unite without a gap with that in the following No. I wish him also to strike off 25 additional copies of the Catalogue of Deerfield Plants without any alterations. I am sorry to trouble you with this business: but I thought that if I committed it to anyone else he would have to trouble you about as much as to do it yourself. By merely handing this to Mr. Converse he will see what I meant.

Yours sincerely & respectfully
 Edward Hitchcock”

BS to EH, Box 3, folder 38

“NH. Nov. 18 1822.

My dear sir,

I will do all that is possible as to correcting your paper but a good deal of it is in type & it may be very difficult to insert the remarks in their proper place without making the printer a pretty serious amount of trouble. In any event I can append the corrections.

Mr. Converse is away so I cannot consult him. I will therefore have the 60 copies prepared for you. Do you not use stratified & its converse as synonymous with schistose structures; you know schistose rocks may or may not be stratified & stratified rocks are not always schistose. I allude to your remarks on the Bellows Falls mica plate & the Gill &c Greenstone. If I do not hear from you I shall almost venture to modify your language a little.

Should you be afraid of anticipation if the catalogue were deferred till the next No.? It may possibly be desirable. The map is in progress. In much haste truly yours,
 BS”

BS to EH, Box 3, folder 38

[Dictated, not in BS hand, through to the pencilled PS which is in BS hand.] “New Haven Nov. 25th 1822.

Dear Sir,

I have in the best manner in my power inserted in your manuscript the various corrections and alterations contained in your letter.

It is very possible that it may not entirely meet your views, for it was a task of some difficulty, in the first instance, to find the proper places and in the second to insert the corrections &c in their proper connection.

I now forward you a proof of your map. We have altered the form of the tablets of the colours to correspond with those commonly found in European maps. Mr. Doolittle suggests that the states should be divided by a stronger line, that the names of the states should be placed on their respective territories, and that the great roads up and down the river should be marked by a distinct line.

You will observe that we have given the outline of the different formations on the map, to prevent mistakes in the colouring. You will of course alter this outline wherever you find it erroneous. Should the botanical catalogue be deferred to the next number, would you be afraid of being anticipated by Mr. Nuttall or any one else?

Mr. Doolittle wishes the map returned as speedily as possible, because the colouring will occupy a good deal of time.

I remain dr. sir your friend & servt.,
 B. Silliman.

[Following is in pencil in BS hand:] P.S. I open my letter today that I have mislaid yours in which you mention the botanical books to which you would have me refer. Pray state their titles again & return me an answer promptly by mail.”

[The following, in ink, appears to be in EH hand:]

“Put ## the letter of the map at bottom.

Insert a fleur de lis.

The printing underneath the profile of Greenstone dikes is indistinct.

Alluvion in the table of colours is spelled with only one l.

Insert the name & boundaries of Scenery south of #.

A little alteration in the coal formation in Durham.

The line between Northfield & Bernardson.
 An alteration in the colouring in Gill Bernardson & Northfield.
 From Northfield in the east side of Connecticut river to the north end of the map very many alterations.
 Line wanting between Northfield & Montgomery.
 Town of Hinsdale omitted.
 West line of Conway should be extended to Deerfield.”

EH to BS, Box 5, folder 12

“Conway 1st Dec. 1822

Dear Sir,

Yours of the 18th inst. did not reach me till a few days since and I have doubted whether this will reach you till you have been obliged to decide concerning the points therein mentioned. However I am not afraid to abide by your decision. As to the corrections I sent, the most important one is that relating to the termination of the secondary greenstone because that is a thing every body must mention in speaking of the subject & I had hoped as that would come in toward the last of the essay it might reach [you] in time for insertion. On every account except [torn loss] (viz. the discrepancy between the colouring of the map & the description) I should prefer to have the corrections appended to the close of the entire memoir instead of the first part. However you may do as is most convenient.

I confess I have used the term stratified as synonymous [sic] with schistose (or rather slaty for I believe the term schistose does not occur in my essay). And I also confess myself unable to draw any definite line between them. Or rather, these two terms, although obviously enough distinct in their extremes, yet along the place of junction there has always appeared a fog I cannot penetrate. And it does seem to me that most geologists in their descriptions have confounded the two things together. Are not the definitions of the two terms so constituted that they will include one another? There is no limit fixed to the thickness either of strata or layers of slate. Hence with Greenough I would ask ‘the laminae of flagstone, the folia of slate, are these strata? Are masses of 400 feet thick strata?’³⁸⁹ And like him presume not to answer. Indeed Sir I have all along been satisfied that I had no very definite idea of what is meant by the term strata. And it seems to me that the close home questions of Greenough near the close of his first Essay will put almost any one in doubt whether he has any distinct logical idea of the term. Bakewell’s distinctions on the subject which are copied by Rees³⁹⁰ I never yet could make any use of. If I am not mistaken they are built on a particular hypothesis. I shall be sorry if my misuse of the terms occasions a misunderstanding though you mention no difficulty except in the corrections. I believe that in the body of the essay I was more cautious to avoid misapprehension. For the [torn loss] pleased me when writing it and still I am [torn loss] about it & shall be happy to be set right [torn loss] correcting my language the only obligation I have to [torn loss] the trouble it will occasion you. To me it would be a favour. I have laboured under considerable difficulties by having no geological counsel nearer than N. Haven to recur to in cases of difficulty.

I fear no ‘anticipation’ about the Bot. Catalogue. As for myself I felt and still feel indifferent about its insertion in the next No. But I found Dr. Cooley quite anxious to have it forward in season. I suppose he hoped it might be of some advantage to him in Georgia where he has gone seeking his fortune. And it may be he will think I have not done right in mentioning some of the localities of plants in my geology unless the catalogue accompanying it since I was indebted to him for a few of them. But you must consult your convenience about inserting it in the next No. If I have 80 pages and several plates devoted to me I think I ought not to complain.

I suppose you have probably learned that there is a supposed new mineral coming out with the name Sillimanite. I have had little hand in it except to forward the mineral to your good friend Prof. Dewey. As to the name, I shall most cordially concur in it. But I did not first find the mineral. I believe Dr. Porter is the discoverer. It resembles Fibrolite or delicate Tremolite. If Prof. D. has not hinted the subject to you, do not let him know that I have.

Brown Augite occurs in granite in Goshen, some of the crystals 6 inches long & 3 broad. More particulars in my paper.

³⁸⁹ George B. Greenough (1778-1855), *A critical examination of the first principles of geology* (London 1819): 89. Correctly: “The laminae of flagstone, the folia of slate, are these strata? Are laminae, four hundred yards thick, strata? Is their any assignable limit to their thickness or tenuity?”

³⁹⁰ Robert Bakewell (1768-1843), *An introduction to geology* (London 1813); Abraham Rees, *The cyclopedia, or universal dictionary of arts, sciences and Literature* (New York and Philadelphia, 6 vols., 1810-1824). For Bakewell, see Silliman to Hitchcock, 2.9.29.

As I write this Sabbath evening, I take the liberty to propose to you a case of conscience. I have frequently found that my botanical and geological pursuits when zealously attended to, although generally conducive to he[alth], still to have the effect of diminishing spiritual [torn loss] mind and for a time of deadening religious sensibil[torn loss] to render me less solicitous to fulfil [sic] the duties of [my min]istry. So much so indeed sometimes as to make me fearful I was not in the way of duty and to suspect I might be worshipping idols. And if these pursuits be the right eye that must be plucked out, let them not be spared however painful the effort. Now the thought has occurred to me that you might have had the same trials to go through & therefore might be able to counsel me. Pray tell me if you can the remedy in such a case. Must these pursuits be altogether abandoned? Or is there such a thing as pursuing them with a supreme reference to the glory of God? Or does the difficulty lie in attending to them too eagerly? I put these enquiries to you because a mere theologian, it seems to me, could not answer them satisfactorily. There is however this difference between your case & mine. You attend to these subjects professionally, I only relaxationally.

Yours respectfully & sincerely,
Edward Hitchcock”

BS to EH, Box 3, folder 38

“New Haven Dec^r 5 1822

My dear sir,

A day of indisposition confines me at home & leaves the leisure but not much of the ability to look at my letters.

Yours of the first Inst. is this morning received. I believe I have inserted all your corrections in the first part of your MS. The second part received by Mr. Fisher I have not had leisure to peruse although I have been obliged this day to send it to the press. I will endeavour in correcting the proof to alter those places which need it, so as to make them correspond with the other part. I have prefixed to the whole of your communication the title – part I – presuming of course that you will forward the remainder, that is the mineralogy and miscellanies in season for the next number, where I shall prefix part II.

Your use of the words schistose, stratified &c, will I believe, lead to no confusion. I particularly observed as I read the proof that it would make good sense, and would not commit the author whichever way it might be understood.

With respect to the botanical Catalogue, I do not know but it would be prudent to postpone the publication of it to the next number, lest objections should be made that too much space was allowed to communications from a particular quarter. Should it not appear at present I should thank you to explain the cause of the omission when you write to Doct. Cooley.

I am sorry to hear that my long and ill sounding name is to have a snake’s tail put on to it to eke it out for insertion in a tableau comparatif.

I heard nothing of this affair and hope at least that it will not turn out like some similar things in this country, to be merely a new name for an old thing. The annunciation of a supposed new mineral should if possible be accompanied by its Analysis.

I think that without doubt the ministry should be your main object but a collateral & recreative pursuit of science is certainly proper within proper limits. I know some people think otherwise but I am not of the number. Both science & literature have both been much indebted to clergymen & I should be very sorry to lose your services in these departments. I would say more but my poor head will not permit.

I sent you the map some days ago & trust we shall soon hear from you on the subject.

With cordial esteem, truly your friend,
B Silliman”

EH to BS, Box 5, folder 12

“Conway 20th January 1823

Dear Sir,

Your letter & very acceptable packet was received by Mr. [Sylvester] Hovey. The books came safe to hand & shall be carefully kept till I have a good chance to return them. The style of execution of these works is such as to delight at the same time that it rather disheartens one. However if we had the money in this country we should not be like the Europeans. You mention having mislaid the 4th vol. of the Geolog. Trans. I would just say that I think I saw it at Mr. Doolittle’s (the engraver) when I was in N. Haven.

I thank you for the proof sheets, map. &c. They are well executed I think: but the press errors are pretty numerous. I noticed about 45 the first time reading it over, many of which affect the sense. But I blame nobody but myself for I can see the origin of most of them, viz. the obscurity of my hand writing. Shall I not have an opportunity of inserting a list of errata and the end of the whole? On the map [large portion torn away] Mrs. H might colour them. Should you have an opportunity during the winter you will oblige me by doing it & also 60 copies of the Sketch as far as it is printed for which I will settle with Mr. Converse. I hope he has not forgotten to strike off some extra copies.

I return the Catalogue of plants with a copy by Mrs. H. I thought it best to send both as might assist in determining any doubtful names: but I wish to have the copy Mrs. H. made used by the printers because I have added authorities to the genera which are omitted in the other. In all other respects they are alike.

I forward also the remaining part of the Sketch as far as it is finished. Perhaps you will think I comprehend too wide a range. I am too minute but I want this Sketch to serve as a kind of Vade Mecum until a better one appears of the mineralogy of this region. For although most of the minerals comprehended in my account have been noticed here and there, yet they wanted to be brought under one view. However, I request you to strike out without ceremony whatever you think best for I am certain that your taste & judgment is better than mine. You will see that I have not only made Part 2. [torn loss] Part 3 & I shall add Part 4 viz Miscellanies [torn loss] anxious about [large portion torn away]. will do as well as I can with the little time I get & you can say whether it is worth inserting. The remaining part of the sketch will occupy I should judge about two more sheets of the sort I now send and I will forward them by mail ere many weeks if nothing happens.

I hear nothing more from the ‘Sillimanite’ but trust it will not turn out ‘a new name for an old thing.’³⁹¹

Your obliged humble servant,
Edward Hitchcock”

BS to EH, Box 3, folder 38

“New Haven Jan^y 25 1823

My dear sir,

I duly received your MSS by Mr. Hovey & am obliged by the punctuality of their return. I hope we shall escape many errors in your parts 2, 3 & 4. Excepting the first two or three proofs, your pieces were read in proof three times by me, aided by Mrs. Silliman. The errors which affect the sense materially, were, if I mistake not, in the early proofs and are corrected in the errata, but, for any thing the printers could have done, there would have been hundreds of errors, for the MS was – you will pardon me for saying – in an uncommon degree, illegible, especially in the earlier parts, and I think both you & I should find it advantageous, to write a round full hand rather than to stretch one letter [here a mix of illegible and legible words about difficulty of interpreting words run together]. I find myself constantly prone to this mode of writing, especially when I am much fatigued. I think it will be well to make out a full table of errata & let me have it, but I would print only those which are material, just alluding to the others. I am sorry you did not mention what were the omissions in colouring the maps, as they are still in hand, and could be corrected. I will however see, if by diligent search, we can find them. Your 60 copies of maps & sheets of the memoir I will have immediately packed, with the 4th vol. of the Geol. Soc’s Trans. if at Mr Doolittle’s, which I presume is the fact, & they shall be forwarded by the first opportunity.

I shall look for the remaining sheets of your memoir, & am not sorry you have made it so full. It is in my view the ablest thing that has been done in that way on this side of the water; still, I think that had you been less pressed, the style might have been, in some instances, rendered more neat & perspicuous, & I should have taken more liberties with it, had not my health been, during the printing of it, very feeble & the pressure of duty very heavy.

You must not be greatly surprised, if the botanical catalogue should lie over still another number & appear in Vol 7 nos. You must not think that I do not duly estimate it, or that I am disposed to procrastinate, but I am obliged to pay some regard to local & sectional feelings, & the jealousy that there should be too much at one time, from one quarter. Still I do not say that we shall not get it into the next No. I would only drop a hint by way of intimation.

A MS catalogue of books was wrapped (I conclude by mistake) in the other papers. It is directed to Mr. Cook of Hartford. I will consult Mr. Hovey, & if he does not understand it, I will retain it, till I hear from you. Excuse the freedom of my remarks, & believe me with respects to Mrs. H. truly yours with great esteem & respect,

B. Silliman.”

³⁹¹ Sillimanite is an alumino-silicate mineral.

EH to BS, Box 5, folder 12
 "Conway 12th Feb. 1823

Dear Sir,

A pressure of ministerial labours and a state of health forbidding all extra exertion will render it extremely difficult for me to get the remainder of my Sketch ready until at least the first of March and perhaps even one week into March. As I have not yet received the No. of the Journal containing the first part of the Sketch I had hoped that you would not begin to print the next No. earlier than about the middle of March. But if my delay will delay you be pleased just to drop one line into the mail to inform me and I will try yet harder not to disappoint you. Depend upon it, I shall do all in my power to prepare the remainder immediately: but my way for some days at least seems so much hedged up that I thought it best to throw this hasty line into the mail

As to the botanical Catalogue I feel very indifferent about its insertion in the next No. Nay, in regard to myself I should prefer to have it delayed; as I have it in my power now to make a considerable addition to the cryptogamia of many rare & some new species. And should you conclude to insert it in the next No. I will thank you to inform me of it soon in order that I may send you a new & enlarged list of the cryptogamic department. And if you should not insert it you will oblige me by returning the manuscript to me once more by the first convenient opportunity (say Nelson [?] Hovey) in order that I may make the additions in a manner that shall cause you no trouble.

In regard to that little Botrychium of which I sent you a drawing and description some time ago, I am happy in making the following extract from a letter just received from Dr. Torrey. 'That curious [torn loss] Botrychium (says he) I had pre[torn loss] satisfied myself was a new species and entered it as such in my herbarium. I am glad you have determined to publish a description of it. Mr. Schweinitz had the plant from Canada and called it *B. pusillum*: but he likes your name better and has adopted it.' So you perceive I feel quite strong having two of the greatest cryptogamists on my side. I have several other new & interesting species of cryptogamous plants and perhaps should my life be spared I may at some future time offer for the Journal descriptions of them with drawings.

I have no time to answer any thing in your letter of Jan. 25th except to say that I thank you for it. Ere long I will attempt an answer.

Respectfully & sincerely your obliged servant,
 Edward Hitchcock"

BS to EH, Box 3, folder 38
 "N. Haven Feb^y 16 1823
 My dear sir,

I am sorry you are so unwell & oppressed with care. I know however how to feel for your being obliged to labour in this very condition a great deal of the time. If your communication can be here by the 10th of March it will answer, but I should wish it by that time. We can in the mean time be printing what you have already sent but this will of course commit us to have the rest without too much delay.

I think under all circumstances it will be best to defer the catalogue & I will return it to you by Mr. Hovey when you can make the proposed additions.

Your Botrychium is printed & coloured.³⁹² I am glad you find such able men on your side. Your bundle of the sixty copies has been sometime done up ready for transmission but no opportunity has occurred. Will they be of any use to you without the sequel & had you not better let it lie & be packed up with the second & c part & with the map & two other prints which contain some of your figures, or if you prefer colouring the map, had not the whole concern better be sent to you at once which probably can be done by Mr. Hovey at the May Vacation?

Your journal I presume is gone. If not I will see that it goes by the next mail.

Hoping that you will soon have better health, I remain my dear sir, very cordially yours, B Silliman"

Pocumtuck Valley Memorial Association Library, Hitchcock family papers, Box 2, folder 8
 EH to Silliman, "Conway 9th April 1823

Dear Sir, I will thank you to send the packet I suppose you have on hand for me by Mr. Hovey if he can bring it. I have written to him on the subject.

Thinking you might perhaps write me a line at that time I take the liberty of requesting your opinion upon another case of conscience. Suppose a minister of the Gospel has been several years employed in some scientific

³⁹² Hitchcock 1823, "Description."

pursuit in conjunction with a layman, the connection extending however no farther than to the single object of scientific research both are pursuing. Suppose that after several years they conclude to publish the results of their efforts jointly, that is to prefix both their names to the publication, and actually get it ready for the press. But in the mean time suppose the layman to take up his residence in another part of the country³⁹³ and it appears ere long that he has had an unlawful intercourse with a female of which an illegitimate child is the result and that he refuses to marry the female although she had been respectable. Now the question is whether after this it be not the duty of the clergyman to refuse to have his name appear in conjunction with that of the layman? In other words, would it injure the cause of religion were he thus to publish? or ought he to give up the publication? This is with me a practical question or I should not trouble you with [it]. And you already know the reason why I put such questions to you, viz because I feel as if you were better qualified to decide upon physico-theological subjects than a mere philosopher or a mere theologian.”

I am exceedingly pleased with the geological books you sent me. They are written with just that freedom from theory which I like although in regard to most rocks the writers are evidently Huttonians.³⁹⁴ And permit me to ask whether in regard to trap rocks & granite we must not all become so too? I think there is as much evidence of the igneous origin of the latter as of the former. I happen to live in a place not much unlike the Glen tilt except that there is no Tilt to lay bare the rocks deep in the ground: and the veins & beds in this region are evidently forced through the other rocks by volcanic energy. So that although I disclaimed against the idea in my ‘Sketch,’ I am almost ready to say that granite in the strict sense of the term is not a primitive rock. And in such an opinion I should as you know be supported by Macculloch, Van Buch,³⁹⁵ Necker, Bo#, Conybeare &c. However do not yet set me down as a confirmed Huttonian. I trust my motto is the same as that attached to the Geol. Transactions.

I hope you will give us a review of Phillips & Conybeare’s work. The introduction surely contains the best view of the subject of any work that I have seen. And it would have been of vast advantage to me had I read it before writing the Sketch. I have some idea of undertaking to write some essays in the Christian Spectator on the study of Natural History, pointing especially to the connection of geology with the Mosaic Chronology. Is it advisable or shall I be venturing into too deep water? In Conybeare’s introduction I perceive some excellent remarks on the subject. Can I procure that work in this country? Will it not soon be republished? Has Greenough’s work ever been published in America?

Since finishing the ‘Sketch’ I have been lying upon my oars in regard to natural history. I find it necessary for me once or twice in the year to take a journey and I wish to make them subservient to the study of Natural History. But now I have no definite object in view & feel unsettled what course to take should I be permitted to journey this spring. I have thought some of the White Hills. But as the coast is better for my constitution I have been thinking of the island of Nantucket & Martha’s Vineyard. Can you tell me whether these would be probably interesting spots or are they all sand?

I have just got finished a geological hammer in which I have endeavoured to combine in one instrument three or four of # used in Europe both for the sake of convenience & economy.³⁹⁶ Fig. 1 is a side view of the hammer. The lower part a is pointed a little so as to endure a heavier blow without injury. The other end g is brought to an edge. The dissection of the edge coinciding with the handle as shown in Fig. 2. In the handle a hole 6 or 8 inches deep & half or three quarters of an inch diameter is made to receive a steel pick or drill which when not wanted is confined in the handle by a spring d closing down over the end of the [torn loss]. The hammer without the handle weighs a little s# of 2 pounds. Thus I can detach specimens from the obtusely angular surfaces of rocks with the rounded part of the hammer, cleave schistose rocks & divide specimens with the edge & detach mineral specimens that are deeply bedded by the pick or drill. It may however admit of improvement. It is only the first trial.³⁹⁷

I wish you would send back the Botanical Catalogue. For several reasons I do not say certainly that I shall return to it at all. Should I do so would it answer to give the localities of the cryptogamic plants? It would

³⁹³ This sounds suspiciously like Dennis Cooley, his erstwhile collaborator.

³⁹⁴ “Huttonians,” also called “Plutonists,” those who agreed with the theories of James Hutton (1726-1797) who taught that the earth’s hot interior created new rock, versus the “Neptunists,” followers of A. G. Werner (see Silliman to Hitchcock, Feb. 14, 1821).

³⁹⁵ John Macculloch (1773-1835), *A description of the Western Islands of Scotland* . . . (London 1819); Leopold von Buch (1774-1853), *Travels through Norway and Lapland during the years 1806, 1807 and 1808* (London 1813). For Conybeare, see Silliman to Hitchcock, 10.2.22.

³⁹⁶ Here Hitchcock gives inked profiles as eventually published by Silliman.

³⁹⁷ “New mineralogical hammer, by Rev. E. Hitchcock, A.M.,” AJS 7, 1 (1824): 175. The accompanying line engraving and the short text follow Hitchcock’s letter very closely.

probably double the list: but would be much more valuable to the botanist as there is not a single place in all N. England where the localities of this kind of plants have been given to the public. – More concerning this Catalogue hereafter.

We hear of a terrible riot at Yale. I hope the bones of the officers are all safe.
Respectfully yours, Edward Hitchcock”

BS to EH, Box 3, folder 38

“NH. May 5 1823

Dear sir,

You will be disappointed in not seeing the whole of your essay in No. 14. I found it would occupy nearly half the no. There was much & various matter as you will see & I could not otherwise satisfy my correspondents. Your essay also divided very conveniently at the “Scenery” which will appear in the next no. & there will then be room for addenda should you have any. Under these circumstances I suppose you will not care to have your 60 copies forwarded but would wish them reserved till midsummer when on the completion of the essay I will forward the whole at once.

I return the catalogue agreeable to your request & of course leave any future disposition to your better judgment. I will insert it if returned altho – possibly, from the impatience which is manifested on the subject of botanical catalogues, it may perhaps be expedient to divide it between two nos. As to the cryptogamic plants, I am disposed to think it would be best to make that a separate paper. Dr. Ives thinks it would have been best that your botanical notices should have been separated from the Geological paper.

As to the case of conscience: I am sorry to say that I have no doubt as to what you must do, although the world ought to be more just than to say any thing as to the accidental association of names. But still I think the impression on religious people would not be agreeable & those of a different character might sneer. Cannot you publish the thing anonymously? You would then have much of the same credit as now, without any danger of odium.

Cannot you write a review or at least something of an intended notice of Conybeare & Philips for the Journal? My health is so fluctuating that it is very doubtful whether I can do any thing of the kind or rather it is certain I cannot. Should you be willing to do it I will send you some abstract of letters from M. Maclure on the subject of the book.

I think it would be rather hazardous to write any thing on the subject of the connexion of the Mosaic chronology & geology in the Spectator, because the readers of that work (even clergymen) would not understand you at all, & cannot be at all judges of the matter. Even Prof. ---- [sic] observed lately, in a sermon professedly on the subject, that he did not understand its simplest elements & was willing rather to suppose – fish – fowl – beast – & shell created just as we find them in the various formations, rather than depart from the puerile & vulgar apprehension of five days of 24 hours. Sooner or later, there must be a full discussion of the subject, but mere theologians & philologists are entirely unqualified either to discuss the subject or to understand the discussion.

I cannot say any thing of Nantucket & Martha’s Vineyard. If you go there the best way would be to visit Boston first where Judge Davis or Dr. Webster or their friends could tell you all about that region.

I admire your hammer very much & if you do not send me something more perfect it is very possible I may notice this in the next no. of the Journal..

Our riot was a small affair & completely put down at once both by the College & civil authority. The stories were very much exaggerated.

I hope you will come this way this season altho not this month as I must be off somewhere for health as I have been very good for nothing this spring.

The Journal will appear in a very few days. You will observe that I have succeeded in melting not only charcoal but plumbago & anthracite so that the diamond is now the only unmelted body & this I do not despair of as I think I have softened it.

I remain dear sir with great regard, truly your friend & servant,
B Silliman”

EH to BS, Box 5, folder 12

“Conway 20th October 1823

Dear Sir,

I sympathize sincerely with you in the loss of your health & hardly know what has produced within me such a dejection of feeling as the news of it which I received several months ago. Yet I must confess that from a knowledge of the multiplicity of your duties I anticipate that the sword would eat away the scabbard. But from

what I learn I have some hope that your constitution is only exhausted not worn out & that relaxation will remit it. If it be otherwise I trust there is a power who can and will sustain you.

I cannot expect that you will yourself be able to give an answer to this letter: but if you can direct an amanuensis to satisfy me concerning a few enquiries, it will much oblige me.

I return by Mr. Hovey the geological books you so obligingly lent me last winter, with my thanks for their use. I have written a Review of Conybeare & Phillips and have undertaken to give a full analysis of their work with remarks relative to this country &c. It only needs to be copied to be ready for the press. Now one enquiry is whether you want it for the Journal? Or are you obliged to give up that work? I have been fearful such is the fact as I have heard nothing of it since last spring. If you have concluded to discontinue it or to commit it to other hands, will that review be wasted?³⁹⁸ If it is not, I think I shall send it to some other work as I feel it to be of importance that an analysis of that work be presented to American geologists. It seems to me that many facts & principles are there brought forward which will put somewhat of a new face upon our geological descriptions. Such an analysis however could not be prepared without occupying considerable paper. Seven sheets of common foolscap leaves will be taken up by the Review & the extracts.

I have also nearly ready for the press a short account of the geology of Martha's Vineyard³⁹⁹ & expect ere long to have a description of two or three new species of plants with plates. Will these be wanted?

I lately preached a sermon before the Pittsfield Med. Institution in which I came out with the new views in regard to the first chapter of Genesis. It is now in the press & I hope you will pardon me for referring to your Lectures as an instance of the defense of such views in this country.⁴⁰⁰ My statements must be propped up by some good authorities or they will be disregarded since our divines generally do not, as you have remarked, understand even the elements of the subject. I mean to send you one of the sermons when they are out.

If you do not publish the remainder of my Sketch of the Geology &c of the Connecticut, will you advise me whether I had better do any thing with it?

I hope you will have strength enough to write to Mr. Eaton on the subject of his new nomenclature of our rocks.⁴⁰¹ I presume you cannot approve of such cutting or slashing especially before the man knows whether our secondary strata do not correspond to the European rocks. I will just mention one instance in which you can see how far his theoretic view warp him aside. He has referred to Gorney [?] as a locality of his Calciferous Sandrocks & has put it in the transition class. Now the rock to which he refers is the one I have described in the 'Sketch' as limestone & it is always associated with decided mica slate & granite being interstratified with them! And he knows all this. Is it not to be feared that he has an itch for being the author of a new system? But is it not also certain that he had not geological weight enough to do this? But he will not be stopped unless he is plainly told to & by some one like yourself whose opinion he dare not despise. I shall regret to see his sketch of the Canal come out in the trammels of his new nomenclature.⁴⁰² It will certainly prejudice geologists against his piece & bring upon him the lashes of reviewers. I say not these things from any ill will to Mr. Eaton. I speak only against his spirit of innovation.

I remain Sir with much respect your humble servant,
Edward Hitchcock

P.S. A few years since you recollect I obtained some Ichthyolites for you & at your request mentioned the sum it cost me & I told you if you pleased you might settle with Gen. Howe for one vol. of the Journal. You wrote me that you would do it. Yet I find that volume still charged to me. I take the liberty to mention this not because I am unwilling to pay for it: but because I thought there might be some mistake about it & you might have settled it heretofore. It is possible the mistake may be with me after all.

Since writing the above letter I have concluded to make out the enclosed communication. If your Journal proceeds make what use of it you please, if not, I will send for it.

³⁹⁸ Published anonymously. See note 35.

³⁹⁹ Hitchcock, "Notices of the geology of Martha's Vineyard, and the Elizabeth Islands," *AJS* 7, 2 (1824): 240-48.

⁴⁰⁰ Hitchcock 1823, *Utility*. At the end of a footnote (p. 28) he quoted several writers who expressed the "new views" that ruins of a pre-Noachian world were now the domain of geological inquiry. Hitchcock wrote: "Among those gentlemen in this country, who have publicly maintained similar sentiments to those given above, I trust I shall be pardoned in naming Professor Silliman; who, in his able and eloquent lectures on geology, has been for several years in the habit of illustrating and defending such views of this subject, . . . with all that zeal too, with which an ardent attachment to revealed religion inspires him."

⁴⁰¹ Amos Eaton, *Proposed geological nomenclature* (Albany 1823).

⁴⁰² See Hitchcock to Silliman, 5.28.24.

EH to BS, Box 5, folder 12

“Conway 25th Nov. 1823.

Dear Sir,

Your letter of the 3rd instant came duly to hand and the same day No. 15 of the Journal and I am very happy to find that my fears respecting the discontinuance of that work are not realized and that your health is better than I supposed. I am glad you still have the superintendance [sic] of the Journal since such a work receives its peculiar complexion from the prevailing taste of the conductor.

I shall have an opportunity to send the Review of Conybeare & Phillips in about three weeks and as I conclude you cannot want it before that time I think I shall embrace that opportunity rather than trust it to the mail. As extra copies of my ‘Sketch’ &c I hardly know how I shall obtain them since I do not have a private opportunity of sending once in a year to New Haven except by Mr. Hovey & he will not return the next vacation. There is a stage runs I believe from N.H. to N.Hampton in a day & if you think it safe you will oblige me by requesting Mr. Converse to put the package on board that stage and direct it to me at Conway ‘to the care of Simeon Butler, Bookseller, Northampton.’ I wish he would enclose a bill of the expenses: and should he publish the Review soon to be sent or any other of my communications I wish he would remember to strike off ten extra copies for me.

The essay of Mr. Finch in the last No. of the Journal on the Tertiary questions is very important & interesting.⁴⁰³ He has anticipated many of my remarks in the Review & especially in a sketch I am making out of the geology of Martha’s Vineyard. I think his hints will put a very different aspect on our geology.

I feel thankful to you for the pains you have taken to correct my ‘Sketch’ which is now finished. The last part of it appears to be very correct. I felt a little disposed to murmur at the omissions in that part in No. 15 -- viz. the allusion I made to the beneficent providence of God in regard to the ‘Meteorological fact’ (p. 23) and my apology for errors in the early part of the Sketch. I felt as if that apology were but an act of justice to myself. But probably your judgment in these matters was best: at least I will acquiesce in it.

Against my Pittsfield Sermon in which the new view of the Mosaic Cosmogony are broached I have not yet heard ‘a dog has moved his tongue’ or a man either. However if it be thought of consequence enough I expect to hear from it. Yet I feel tolerably secure behind the shield which the authorities in the Notes presents. [sic] Certainly if I am condemned they cannot deny that I have good company.

In much haste respectfully,
Edward Hitchcock”

BS to EH, Box 3, folder 38

“New Haven Dec^r 4 1823

Dear sir,

Agreeably to the directions contained in yours of the 25th last, the package containing your memoir was committed to the care of the stage office here on Saturday. It was to go to Northampton via Hartford directed as you request, & I trust will reach you soon. I did not see Mr. Converse when I gave the direction for the bundle’s being sent but will soon request him to forward you the bill. This I would not consent to, did the work command the recompense which it ought, but I am now obliged to pay an assistant editor & doubt whether the receipts of the year will cover the additional expense.

I am sorry that any omissions have been made in your piece other than those which you could wish. The truth is that at the time I committed the thing to Dr. Percival & for weeks after, I was too feeble to pay any attention to the subject & gave him ample powers to do as he saw fit nor did I know that any thing in this section was omitted not having examined the Journal since it came out. As to the errata they were sent to the printer with your remarks &c, just as you sent them to me. I fear they have got lost. Before I put them into the mail I will call on the printer & enquire & if I add nothing more you may conclude that they are lost. In that case if you will send them on again they shall be inserted at the end of Vol. 7 which would indeed be their proper place.

You will instruct me whether to put your name to your review of Philips & Conybeare. The reviews in the Journal as well as in other similar works of the kind have generally gone anonymous. I trust you will send me your sketch of Martha’s Vineyard. Have you seen the July no. of the Christian Observer? If not you will read

⁴⁰³ Finch 1824: 31-43. Finch continued his exploration of the tertiary. See his “On the tertiary formations on the borders of the Hudson river,” AJS 10, 2 (1825): 227-29, notable because he wrote that the Hudson “may probably be classed with the tertiary strata of Europe.”

Faber's remarks on the mosaic Cosmogony with much interest.⁴⁰⁴ He is full on our side altho' I attach no importance to his notions respecting the length of the Sabbath of the Creator.

My health continues gradually to improve.

I remain my dear sir as every truly yours & with great regard,
B. Silliman"

EH to BS, Box 5, folder 12

"Conway 17th December 1823.

Prof. Silliman, Dear Sir,

I forwarded the Review of Conybeare & Phillips a week ago & presume you will receive it this week by H. Arms [?] one of the seniors at Yale. I now enclose my view of Martha's Vineyard. You will see that the observations I made upon that island were very imperfect but the interesting nature of the formations induced me to throw together some hints on the subject. If you conclude to admit them into the Journal at all I should be glad to have them inserted in the next No. But I have already deluged you & the public with my geology & botany &c: and have no claims. I can only say that I should prefer to have that other little piece on Trap Tuff &c delayed & this inserted, if both cannot be admitted.

Your letter of the 4th instant was duly received. I certainly did not expect to have them free of expence. But I intend to offer some of them for sale and I want Mr. Converse's bill to know at what rate to put them.

Most of the errata that I sent you were inserted in the Journal and when I spoke of omissions I did not refer to them. It was merely a few remarks which I added by way of apology at the end of the Sketch. From the fact that every remark of a religious character was struck out of the last part of my Sketch I was inclined to suspect that you did not correct it. However I do not complain.

I would by no means have my name prefixed to the Review of Conybeare & Phillips: and if you think my theoretical remarks are improper I am willing to leave it to your discretion to strike them out although I suppose you are in the main a Neptunian.⁴⁰⁵ I have not seen Faber's remarks in the Christian Observer: but am sorry I did not see them previous to the printing of my Sermon at Pittsfield. If I do not very much mistake I have sent you one of those Sermons some time ago.

I am engaged in a Tract on Unitarianism and will send you one when it is printed: though I suppose you do not take as much interest in this subject on account of your local situation as those of us who are on the frontiers.

What a fine geological trip it would be especially for an invalid to sail from New Haven in the summer and follow up the coast to New Foundland examining the tertiary formations that unquestionably exist along that track. It seems to me that such a trip would be both interesting & serviceable to American Geology. I foresee (without any second sight) that the tertiary formations will be all the ton among us for several years.

Sincerely & respectfully your humble servant,
Edward Hitchcock"

EH to BS, Box 5, folder 12

"Conway March 1st 1824.

Dear Sir,

Your letter of the 6th inst. was received about a fortnight since: and the box you so kindly left for me at Hartford reached me a few days since containing the Reliquiae Diluvianae⁴⁰⁶ and a half volume of the Geolog. Transac. uninjured. I feel much indebted to you both for the letter and the books. I had just obtained the Ed. Review which contained a Review of the Reliquiae not suspecting that I should at present if ever see the work itself. I have since obtained the Quarterly & read the review in it of this work. As you request it I will attempt an analysis of the work for the Journal: and I have it also in contemplation (if my health which begins to fail me on the approach of spring & a pressure of pastoral duties permit) to prepare a review for the Christian Spectator. I

⁴⁰⁴ George Stanley Faber (1773-1854), *A treatise on the genius and object of the patriarchal, the Levitical, and the Christian dispensations* (1823). Lengthy excerpts were published in the *Christian observer* 23 (1823), in successive issues from July through October. Rev. Faber reconciled the bible and recent geology, just as Hitchcock did in his Pittsfield lecture, by writing that Genesis "days" was not just twenty-four hours, but longer "periods," and that fossils prove there was non-human life (extinct) before the Mosaic deluge.

⁴⁰⁵ For Hitchcock's anonymous review, see note 35.

⁴⁰⁶ Buckland 1823. Hitchcock labored long over a review of Buckland, which was finally ready in August and published anonymously in the *AJS* 8, 2 (1824): 150-68, 317-38. See Silliman to Hitchcock, August 13, 1824.

think two reviews might be prepared which would not be mere repetition considering the different classes of readers of the two works. If you think proper I wish you would speak a good word on the subject to the editor of the Spectator. I mean in regard to the merits of the work itself not the merits of the proposed review. This I think would prepare the way for the admission of the review into the Spectator which otherwise might not be received. As Buckland's work will probably be soon reviewed in this country I suppose you will wish a view of it to be in readiness for the next No. of the Journal. I hope I shall be able to accomplish this although at present so extremely engaged that I am obliged to deny myself the pleasure of reading the work. As to 'additional illustrations' from this country I have but very few of them at present in my memory. I have neither Hayden's nor Long's work at hand & if you could send them to me I should be glad: and if Greenough's First Principles were added I should be pleased.⁴⁰⁷

The last No. of the Journal came to hand last week: and in both my pieces I did not discover a single press error. I have not yet received Mr. Converse's bill for printing & although I have written directly to him several weeks since but perhaps he has not received the letter. He would oblige me if he would send it by mail: and if he has printed for me 8 or 10 copies of the Review of Conybeare and Phillips they would reach me if he had an opportunity of sending them to the care of Simeon Butler, Northampton or Jay White, Amherst.

It will not be possible for me to send a review of the Reliquiae before the last of this month or the beginning of April.

I rejoice to hear of your up hill progress in regard to health. If your complaint is dyspepsia as I learn it is I believe that inferior as I am to you in every thing else I could on this point give some instruction as I have had fifteen years of bitter experience. But I shall not attempt to prescribe to an M.D. yet I must say that some prescriptions of Dr. Ives and my bread & milk in the morning have within the year past considerably alleviated my complaints.

I have several other things I wish to say but cannot possibly get time. Excuse my haste and believe me
Sir your obliged & humble servant,
Edward Hitchcock"

BS to EH, Box 3, folder 38

"New Haven Mar 6 1824

My dear sir,

Immediately on receiving yours of the 1st, I packed all the books which you mentioned & added Granville Penn's book on the Mosaic & mineral Geologies which I have just received & have not read but am willing you should read it first & return it as soon as you can spare it conveniently.⁴⁰⁸ The other books am not in a hurry for.

Your analysis will be in season by the 8 or 10th of April & I am glad you are willing to undertake it. I will speak to the Editor of the Spectator & again to Mr. Converse as you request. As to your bill & the spare copies of any of A & Sc, I sent the bundle to the care of Mr. Solomon Stoddard Northampton – paid to Hartford – by stage & would have paid through but they would not receive it here. You will of course pay Mr. Stoddard.

Do not persist in writing if it will injure your health. Mine is a little better. I have for nearly five months pursued a milk diet for two meals.

Pardon my haste & brevity & believe me always with great esteem & regard, your obliged friend and servt.,

BS"

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania

"Conway 17th March 1824

Dear Sir,

It becomes painfully necessary for me to begin this letter by informing you that it has pleased the Most High after a very distressing sickness of fourteen days to remove from us our dear & only son. We yesterday committed his remains to their cold bed where they must sleep till the resurrection and although we hope that we bow submissively to the kind hand that has connected us yet as you well know from repeated experience the heart

⁴⁰⁷ Horace H. Hayden (1769-1844), *Geological essays* (Baltimore 1820); James Edwin, ed., *Account of an expedition from Pittsburgh to the Rocky Mountains ... 1819 and '20 ... under the command of Major Stephen H. Long ...* (Philadelphia, 2 vols., 1822-23). Silliman praised Long's two volumes in his Journal, vol. 6, 2 (1823), 374-75.

⁴⁰⁸ Penn 1822. Penn attacked the new geological ideas while presuming to reconcile science and theology.

must bleed for a season even [torn loss] the will is subdued. That we shall have [torn loss] sympathies I have no doubt. We ask sincerely and earnestly also that we may have an interest in your prayers that the good intended by God to be effected by this affliction may not be lost.

And here may I be permitted to suggest that you enjoy one mercy of whose value from the nature of the case you may be but imperfectly aware (and God grant that you may never be compelled to learn its value by the bitter experience of losing it). I mean that you have around you physicians of tried skill in whom you can repose very great confidence in time of sickness. Can there be a more agonizing state of mind than to see a dear friend labouring day after day under disease and be compelled by a moral necessity at least to employ physicians in whose professional knowledge & skill (however high may be your opinion of the good intentions) you have little or no confidence? Even if your opinion is unfounded the agony is not thereby relieved. Oh, I do think this one of those miseries that admit of no alleviation from any earthly source. But I forbear. I say these things strictly *inter nos* and perhaps I have done wrong thus to permit an aching heart to have vent.

I received your letter of March 6th in due season and also the same day your second package of books, viz. Long's Expedition, Granville Penn's Work, Hayden's Essays & Greenough's Geology, all safe and uninjured. But I fear I shall disappoint you concerning the proposed Review of Buckland, that is I fear I shall not be able to get it ready so soon as the 10th April. You well know the heartlessness & indisposition to effort that accompany afflictions. However it is necessary to conquer such feelings if possible and I will do as well as I can and write something as soon as I can. Penn's work is spoken of in the Ed. Review as an effort to restore the dark days of geology.⁴⁰⁹ I may not have an opportunity to return it immediately.

In haste yours respectfully & sincerely,
Edward Hitchcock"

BS to EH, Box 3, folder 38
"New Haven March 20. 1824
My dear sir,

I most cordially and feelingly condole with you on the late afflicted bereavement in your family. I know indeed, from early experience every pang you have suffered, & hope you may sooner recover from the shock than I did from my first loss of this kind – that of my eldest son.⁴¹⁰ You will present my respectful condolence to Mrs. Hitchcock, whose suffering will of course, embrace all that belongs to yours with the addition of what a mother only can know.

But perhaps we are selfish in mourning so deeply for those that are 'bone of our bone and flesh of our flesh,' for it is the irreversible order of providence, that we must lament or be lamented, & the only condition of protracted life, is the chance of new surround for the death of those whom we love. The sooner we come to the habitual contemplation of the absolute uncertainty of all our possessions, and to an unqualified resignation of mind to part with them whenever called for – the better.

The death of infants & of other very young children is always attended (in my view) with so much consolation, that I can look upon the calm, sweet expression of their little bodies sleeping in death (now excepting even my own children) with a degree of pleasure which has little alloy. For I consider the declarations of our Saviour, as deciding the point that his sacrifice will cancel their original taint, and neither scripture nor reason will justify us in believing that there will hereafter be a penal retribution awarded to any thing but actual transgression.

The death of half mankind within the age to which I allude, I consider as evincible [sic] of the mercy of God to our fallen world, in removing so large a part of its population, before they have become, in any responsible sense, moral agents. I know that these views interfere with Metaphysical divinity, which I value little, compared with the consolations which, I think, I have a right to draw from the Scriptures. I am very sorry that your anxiety should have been increased by unskilful [sic] medical practice, but I have followed to the grave, four of my own little flock, whom the skill of the wisest & most devoted physicians could not save.

As to the review, make it the recreation & refreshment of those hours when you might dwell with too much intensity in your sorrows, and do not oblige yourself to execute it any faster than you can do it both comfortably & well. Although it would be acceptable (from its importance and high interest) it is not indispensable for the next number, as I have Geological matter in abundance on hand. – Execute therefore or postpone it, just as you find it convenient.

⁴⁰⁹ In a footnote, the anonymous reviewer of Buckland 1823 in the *Edinburgh review* 77, Oct. 1823, pp. 206-07, wrote an adverse account of Penn 1822.

⁴¹⁰ The Sillimans' first son Trumbull died in 1819. Three other infants were lost before 1823.

I have spoken to Mr. Mitchill respecting the Review for the Spectator. He says that department is occupied for the next two numbers, but that he will write to you.

[torn omission] again reminded Mr Converse of the bill [torn] he promised to forward you without delay.

Mr. Finch in a recent letter desires me to express to you his thanks for the handsome notice which you have taken of his piece on tertiary formations.

I remain Dear Sir with the expression of my own and Mrs. Silliman's kind sympathy for yourself & Mrs. Hitchcock,

Yours very truly,
B Silliman"

EH to BS, Box 5, folder 12

"Conway 6th April 1824

Dear Sir,

I shall endeavour to forward to you about the middle of next week so much of the Review of Buckland's work as will include his descriptions of the Kirkdale cave & perhaps the other caves. This you recollect is the most interesting part. I have tried my utmost to get it ready by this time: but the sickness of my child & subsequent sickness of my wife with an unusual pressure of ministerial labour as a fast funeral, visiting the sick &c with the poor state of my own health have been too strong for me. A few weeks since I was called to sit in council a fortnight at Amherst to settle difficulties between minister & people and today a sense of duty compels me to listen to another similar call to go to Greenfield. However I hope I shall be able to send you so much of the review as stated above amounting probably to 12 or 15 pages of the Journal. Whether that will be too late you an judge. I would not have you delay the Journal a moment unless you please.

I leave it with you to make what alterations you think proper in the Review: but I dare not give the same liberty to your coadjutor since the subject is of such a character as to excite perhaps some of his prejudices.

If you insert my piece on a singular variety of Conglomerate &c in the next No.⁴¹¹ I will thank you to subjoin a paragraph you will find on the last page of this sheet & oblige Edward Hitchcock"⁴¹² [.]

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania

"Conway 28th May 1824

Dear Sir,

I return by the bearer Mr. Hovey the work of Granville Penn but presume to retain the other books you sent me for a time. The truth is I have not yet read them all thoroughly: but I should now return them had I finished the Review of Buckland. The old difficulty however of which I complain to you in almost every letter, viz. poor health & a pressure of necessary avocations have delayed me almost beyond measure in preparing that review. I have been engaged this spring [torn loss] a new employment, buying a place & building an addition to my house, a new business for me & one that almost distracts me. I hold myself bound however if possible to complete the Review before it is wanted for the Journal.

I enclose herewith a copy of my Geology etc. of the Connecticut for Yale College Library, requesting you to hand it to the Librarian. I send also by Mr. Hovey a few copies to be deposited for sale at Howe & Spaulding's bookstore @ \$1.25 although I am sensible this is very low considering the plates. Yet such things are not very salable and I scarcely expect to sell any of them. If you can do it in conscience however you will oblige me by mentioning the book to your class in geology & perhaps some of them who have not the Journal might wish to obtain it.

I suppose you have seen Mr. Eaton's Geology of the Erie Canal. I regret that I am thrown forward into so conspicuous a place in it. You will see that my remarks were hasty & desultory. I intended them merely to be incorporated with the body of the work if they could furnish any assistance & expressly cautioned him against what he has done.⁴¹³ Should you notice his work in the Journal I wish you could throw in some hint of this kind:

⁴¹¹ Hitchcock, "Notice of a singular conglomerate, and of an interesting locality of trap tuff or tufa," AJS 8, 2 (1824): 244-47.

⁴¹² No such paragraph has been found.

⁴¹³ Eaton 1824). Pages 158-63 are labeled "Rev. E. Hitchcock's Section," and are followed by a hand colored map, "Profile of rocks crossing part of Massachusetts taken under the direction of the Hon. Stephen Van Rensselaer, by E. Hitchcock 1823." Hitchcock was dismayed that Eaton published his informal words (which could make him seem a fool), such as these: "In the vicinity of Boston, I do not profess to be very accurate, not

for I really believe as it is I shall suffer. If I had thought myself preparing an essay for such a place or that I was to be pitted against Mr. Eaton as he seems to regard me, I should have taken more pains.

Respectfully & sincerely yours,
Edward Hitchcock

[P.S.] I suppose you do not wish for a copy of my book for your private library as you have it all in the Journal & therefore I do not offer you one. Should you wish one however you can obtain it by calling at Gen. Howes & this shall be your warrant."

BS to EH, Box 3, folder 38

"New Haven June 12 1824.

My dear sir,

On my return, four days ago, from Washington I found your letter of May 28th with the Book on the Mosaic & mineral Geology [Grenville Penn's].

In the name of the college I return you thanks for the copy of your geology of the Connecticut which you have been so good as to present to the library. If an opportunity presents I will recommend the book to the class but the state of my health still leaves it doubtful whether I meet the class this summer. I am better, but far from being confirmed, and my friends think that I ought to reserve my strength for next winter. I will mention your work in the next No. of the Journal. I am sorry to learn that your health is so feeble & would not have you put it in hazard on account of the Journal, although we are laid under a kind of necessity of completing the 'Review' in the next No. If the remainder were in hand early in July, perhaps I should print it under the first head, but if not, it can go [loss] as in the last No. under a miscellaneous [loss] head. I trust the Journal has reached you before this & hope you will find your article correctly printed. You will observe that I made a few slight alterations. The Books you may retain as long as you have occasion for them.

Mr. Eaton's book I have not yet seen although I understand that he has been here in my absence & promised to send me a copy. If I notice it I will endeavour to # in your qualification.

I thank you for the offer of a copy of your book. It is however unnecessary as I have it all in the Journal.

Wishing you well through the toils of building & better health, I remain dear sir, yours with much esteem,

B Silliman"

BS to EH, Box 3, folder 38

"New Haven Aug 13 1824

D^r Sir,

I have received the whole of the Review of Buckland and am much pleased with it. It will appear in the present number.⁴¹⁴

I am extremely sorry to hear of your ill health, but do not think the review bears any marks of it. I am quite obliged to you for your labour on this subject.

You need not trouble yourself to send back the extra copy of the Journal until you have a private opportunity to come yourself. I expect to be here 'till after commencement but hope you will time your visit so as to be here at the meeting of the Geological Society at that time. Col. Gibbs will be here.⁴¹⁵ I still wish you to send the copy of Buckland to Gen^l Van Rensselaer [sic] and to write him when you send it.

I remain with great respect, Most truly yours,

B Silliman

P.S. I will propose Doc^t Emmons as a member of the Society."

BS to EH, Box 3, folder 38

"NH. Aug 23 1824 [date follows signature; except for signature, this note is not in BS hand]

having examined the rocks there with sufficient attention. I only put down such as I have noticed in travelling over the ground hastily two or three times."

⁴¹⁴ Hitchcock (anonymous), "Notice and review of the 'Reliquiae Diluvianae' . . . , AJS 8, 2 (1824): 150-68, 317-38.

⁴¹⁵ Col. George Gibbs (1776-1834), prosperous Newport businessman, amassed a large collection of minerals that Silliman lured to Yale in 1811 as a loan; Yale purchased the Gibbs "cabinet" in 1824. Friend and major patron of Silliman, he supported the founding of Silliman's journal in 1818. Stephen Van Rensselaer (1764-1839) was a wealthy patron of Amos Eaton, who used his resources to found Rensselaer Polytechnic in Troy in 1824.

Dear Sir,

Mr. Eaton has written me pressing for Professor Buckland's book. This is all he wants for before setting out on his tour to examine the western caves. Be so good as to forward it immediately by the Stage & write to Mr. Eaton or General Van Rensalaer [sic] by mail. If you can put the box under the care of some passenger it would be very desirable but I would send it at any rate.

I remain truly your friend & sevt.,
B Silliman"

EH to BS, Box 5, folder 12

"Conway 16th Nov. 1824

Respected & Dear Sir,

I have given a more extended notice of Mr. Bailly's paper than I had thought of: but I think the subject peculiarly important in this country. Should you publish it I am very fearful there will be some mistake made by the printer either in the figures or the algebraic formulas as some of the letters & characters are rather blind. An error of this kind would very much injure the value of the piece to astronomers: and if it were possible I should be very glad to see a proof sheet. I have no objection [sic] my name should appear as the writer of the notice but shall leave that point to your discretion.

If I have misnamed the oxide of manganese by calling the red species the siliceous oxide I wish you would correct it. I have not Cleaveland's second edition to which I can have access at this time.

I intended to have asked your opinion whether the remarks of Mr. Eaton upon the Review of Conybeare & Phillips needed from me any reply. He evidently misapprehended me in some things: but I wish to avoid controversy.⁴¹⁶

Respectfully in haste,
Edward Hitchcock"

[In BS hand: "answered Nov 26 1824"]

EH to BS, Box 5, folder 12

"Conway 13th Dec. 1824

Dear Sir,

The bearer is Mr. Joseph Ware of this town who received his education at Amherst Collegiate Institution and who wishes to enter the Theological class at your College. I have advised him to attend your lectures on Geology especially. And I should not think it strange if Rev. Mr. Boardman of North Haven should wish to come to hear you as his attention is somewhat excited to the subject.

I want very much for a few weeks the copy of Conybeare & Phillips Geology of England & Wales in the library of the Geol. Soc. if it could be spared and if it were consistent to let me have it. I expect one of the tutors of Amherst College to spend a few weeks with me ere long with a view of learning something of geology and I do not know of so good a view of the present state of the science as the Introduction to that work presents. Could you send it to me care of S. Wells Esq. Northampton it would soon reach me. However if a chance does not fall in your way do not be at the trouble of looking one up.

Is there any chance for me to send a box of spodumene sil. ox. of Manganese indiolite & other minerals occurring in this region to some English Geologist and obtain in return specimens of the English rocks as described by Phillips & Conybeare? Do you know of any one across the water who would be likely to make such an exchange: and if so can you tell me in way I can get a box to him? Do you know whether Mr. Phillips exchanges minerals?

I do not send back by this opportunity Mr. Bailly's Astronomical paper because from your letter recently received I learn you mean to send the proof sheet to me to correct and in that case I shall need the paper. I have altered some of the characters in the formulas to prevent if possible any errors & on that account it could not be easy for you to correct the proof if you had the paper in your hands. It is one of those cases in which a slight error in the formula or the figures might render the whole useless to the practical astronomer.⁴¹⁷

⁴¹⁶ Eaton's letter to Silliman about the Conybeare and Phillips review appeared in the AJS 8, 2 (1824): 261.

Eaton's comments constitute a passionate defense of the Wernerian system and a refusal to accept the British writers' views and nomenclature.

⁴¹⁷ Hitchcock eventually reviewed Francis Baily (1774-1844), *The new method of determining the longitude by the culmination of the moon and stars* . . . in the AJS 9, 1 (1825): 107-15.

[The following parag. has three large Xs through it, presumably by Hitchcock himself.]

If you have not already inserted my list of localities in the Journal you are requested to say concerning the Sparry iron found in Plymouth Vermont that it occurs in a large vein two or three feet wide near the meeting house and that I had the information from Mr. L. G. Clarke.

You may recollect I left with you a specimen of a beautiful limpid mineral in granite which for the moment you suspected might be adiolaria [sic] but which you found upon further examination to match quartz. Upon further examination I am tolerably confident it is the limpid topaz. I accordingly put down on the next page a short description asking you to append it to my list of minerals already sent provided you can find time to reexamine the specimen I gave you & find my opinion confirmed. In the case of so interesting a mineral which has never been credited certainly to this country I should be unwilling to announce it & have it prove something else especially since some of the Cambridge folks hint that the localities in your Journal are apt to be incorrect. I have sent a small specimen to Dr. Webster & if he finds it to be topaz he may notice it in his Journal: but I should like to have it appear first in yours.⁴¹⁸ If you reexamine it I wish you to state the fact in the Journal.

Respectfully & sincerely yours,
Edward Hitchcock”

BS to EH, Box 3, folder38

“New Haven December 27. 1824. [except for signature, this note is not in Silliman’s hand]

Dear Sir,

I will send you the copy of Conybeare & Phillips by the first opportunity. If none occurs sooner I can send it directly to you by Mr. Hovey in about fortnight from this time. As to exchanging minerals, I suspect Mr. Phillips would readily accede to a proposition of this kind, but I would recommend to you to apply to Mr. Griscom on the subject. He is Mr. Phillips’ particular friend and would be the medium of communication between you.

Mr. Parkes has expressed to me a strong wish to obtain very good specimens of American trilobites and other American fossils and I presume he would send you English rocks in exchange. Dr. Webster is however I presume in correspondence with more European Mineralogists & Geologists than any other man in this country and I presume would be able to help you on this subject.

The printers have delayed the Journal unexpectedly. You may rely however on receiving a proof of your astronomical paper [review of Baily], and I wish you would return it with as little delay as possible and with your corrections especially of the characters made as legible as print. If the ink spreads it will be better either to erase on some good paper and write the corrections on this, or to write them with a pencil with a very sharp point and then to trace them over again with a sharp pointed pen. This I have found to be a good method to prevent ink from spreading.

I have not yet had time to examine your ‘topaz’ and therefore did not append your description to your list of localities.⁴¹⁹ There will be time however to make the examination before the Journal is finished and to insert a notice among the miscellanies.

It is certainly desirable that there should be no errors in the statements made of the localities of minerals, but it is equally certain that those who make the communications and not the editor are responsible for them. I am not disappointed at suggestions of this nature from the quarter which you mention. I have long thought that there was a willingness there to supplant the ‘American Journal’ and that the wedge which they are attempting to drive was entered for that purpose.

I have received your reply to Eaton and will insert it. I could wish however that when you write him a private letter you would mention the subject in a conciliatory way. The notice which I wrote of his survey on the great canal, implying censure on his arrogance, which censure I expressed still more frankly in a private letter joined with your late communication, may perhaps influence him to think that there is a systematic plan to oppose him which as he has both considerable influence and energy and unbounded confidence in himself, I should wish to avoid.

By the bye, suppose you give us some account for the Journal of Dr. Macculloch’s new system of rocks.⁴²⁰ It would I presume form an interesting article. I remain D^r sir, truly your friend & servt,
B Silliman”

⁴¹⁸ Webster edited the quarterly *The Boston journal of philosophy and the arts* (1823-1826).

⁴¹⁹ While at Yale, Hitchcock collaborated with Silliman’s nephew Benjamin D. Silliman in making a chemical analysis of a specimen of topaz. See their article “Topaz,” *AJS* 10, 2 (1826): 352-58, and Silliman’s letter to Hitchcock, February 19, 1826.

⁴²⁰ John Macculloch, *A geological classification of rocks* . . . (London 1821).

EH to BS, Box 5, folder 14
 "Conway, 24th Jan. 1825

Dear Sir,

I send by Mr. Hovey the proof sheet which was received a few days since. I found but very few errors in it, the corrections of which I have endeavoured to make intelligible. Had I returned it by mail it might have reached you one or two days sooner but on account of the greater certainty of a private opportunity I thought it best to wait.

The work of Conybeare & Phillips I have not yet received and if you have not forwarded it already you need not do it unless you find a direct & convenient opportunity as the young gentleman who has been attending to geology with me will soon leave me. He will however be distant but a few miles and as he has a good mind and quite a taste for geology I should be glad to have him read it.

I have just been arranging & labeling my small geological & mineralogical collection, the former of which contains about 450 specimens, and the latter about 750 such as they are. The leading numbers on the catalogue designate the species & the subordinate numbers the varieties & individual specimens and corresponding numbers are attached to the specimens by a paste made according to Dr. Macculloch's directions in your Journal. Along the shelves the names of the species & principal varieties are fastened by small nails. I have never seen any cabinet arranged exactly according to this plan & therefore I mention it. I have recently obtained from Deerfield one end of a hexagonal column of greenstone about two feet diameter: and it has occurred to me whether a joint would not be disireable [sic] for the Geological Society: But really I do not feel able to incur the expence of transporting one of them to N. Haven as it would weigh 200 pounds or more. If the Society thought it an object enough to defray this expence I would endeavour to forward one. It would by no means compare with the joint of basalt in your cabinet but the hexagonal form is quite distinct.

I have written to Mr. Eaton & trust he will not be offended at my remarks. If he should be, I should regret it as it was far from my intention. I told him (which is indeed true) that I did not know that I was opposing you & other geologists as much as him since I knew not your opinion on the subject in question.

Sincerely & respectfully,
 Edward Hitchcock"

BS to EH, Box 3, folder 39
 "New Haven Feb^y 2 1825

My dear sir,

I am glad you found your piece so correctly printed & we were very glad to receive the proof back again as we had been several days in waiting for it. Mr. Tutor [?] Twining revised it & I trust it will be correct. I forwarded Conybeare & c a month ago or more by a young Mr. Synde of this place to the care of Mr. Wells as you directed & I have no doubt you will find it there. Mr. Synde is, I believe, a member of the school of Messrs Bancroft & Cogswell.

Your mode of disposing of your cabinet is ingenious. I should be very glad to add to it when in my power, but I find that with my feeble health & inevitable avocations I must not attempt to form collections – single specimens I can sometimes forward. These remarks are not however in reply to any thing you have said or hinted but to my own feelings. If some one will bring the joint of greenstone here in a sleigh for a dollar, I will pay it with our thanks but it would answer to find it in boats & waggons [sic] by weight. The Society is poor & is in my debt for disbursements.

Dr. Morse wants a concise but luminous popular sketch of Geology & Mineralogy for a new edition of his Geography & has applied to me.⁴²¹ It is impossible for me with my health to do it but I have mentioned you & he will write to you on the subject. Perhaps you will not thank me but no! is a short word & may be paid in a kind way. He mentioned the Review of Buckland as containing many ideas that he wanted & I think you might introduce a correct view of the Mosaic Geology. You must not work for nothing & if the Dr. cannot pay you money, stipulate for copies of the work to a proper amount. I hope you will be able to do it.

I remain very truly your sincere friend,
 B Silliman"

EH to BS, Box 5, folder 14
 [No date, no salutation; between Jan.24 and April 1].

⁴²¹ Jedediah Morse (1761-1826), *The American geographer*, 1792 et seq.

"I have no communication for the next No. of the Journal, at least none prepared and very few in embryo. Indeed, Sir, I feel as if I had nearly done with things of this sort. My bodily complaints have reached that point when mental effort is most difficult and I know not which is greatest, corporal disability or mental imbecility. I struggle along with my professional duties with great difficulty & great deficiencies: and were it in my power, I should think it my duty to change my mode of life entirely. But what can I do? in what business engage? how support my family? I have very little property but am convinced I must soon sink irrevocably unless some remedy can be devised to relieve me. Yet I ought not to fear for the kind providence that has hitherto blessed me will provide. Pardon this disclosure of private trials, not made yet so freely even to my wife. I did not intend to trouble you with it.

If you can do it without taking one additional step it may be interesting to Mr. Hovey to inform him that Mrs. H has recently been called to bring her brother Mr. Jay White of Amherst who was cut down by the pneumonia typhoides, a disorder that has made havoc with several other friends & connections of ours.

Yours respectfully & sincerely,
Edward Hitchcock

BS to EH, Box 3, folder 39

"New Haven April 4 1825

My dear Sir,

I hope the written letter will not offend your delicacy. I have heard some hints as if your name was not forgotten at Amherst & if it is in my power to serve you it is certainly my wish to do so. I think this might afford a change of occupation favorable to your health & to the continuance of your # which I grieve to hear is put in hazard by the present state of your health. Should you have the offer at Amherst by all means accept. There are many men who will be glad of your present situation & will completely fill it & the situation of a Professor although arduous has many more alleviations than that of a clergyman. If you think that my letter will be of any use to you, you can easily have it conveyed to Amherst, by a private hand, & dropped in the P Office there or in some other P Office. Should they wish to refer to me for a more detailed opinion I will cheerfully give it. If you care nothing about the affair just throw the letter under the fore#.

I am glad you were pleased with the last No. of the Journal & I am vexed that you are still teased [sic] with two more Nos. I will make one more effort to correct this blunder. 50 copies of the Journal were ordered a few weeks ago from London & Mr. Miller the bookseller who writes is very sanguine as to the success of the work in England if properly pushed there. If I had health to work as I am disposed, I think I could now make it go, with the assistance of my good friends but I am not possessed of much physical energy.

I was aware of the criticism that might be made on Mr. Maclure's remark,⁴²² but perhaps there is a # in which even theology would admit its truth at least in a degree. For it is ignorance of moral duty & of our ultimate destination joined with ignorance of other things which is the chief cause of our woes. The heart must also obey but it cannot obey while the mind does not know. When I see you I can perhaps give some explanation of Mr. Maclure's irritability.

Mr. Samuel Morey [?] of Oxford NH is my boulder man. I know nothing of the facts which he describes. I shall pay for your ninth volume & should any more duplicates come for you just let the extra one lie in the office. I should be glad if the few things which you have in embryo & if they are not mature for the birth before summer should be glad of them then, say June or July but not at the hazard of your health.

I am sorry to hear of your & Mrs. Hitchcock's loss which is severe indeed⁴²³ – These things are past our comprehension.

Mr. Dewey has recently forwarded some beautiful drawings of your lady's hand. They are now with the engraver & if you or she do not forbid me perhaps I shall make bold to put her name on the plate with a date – as they would do her honour.⁴²⁴ I am glad that the engraving of the Gyropodium pleased you⁴²⁵ & that you are satisfied with my imperfect examination of the topaz.

⁴²² AJS 7, 2 (1824): 256-64.

⁴²³ The death of her brother Jay White (1795-April 1, 1825).

⁴²⁴ Reverend Chester Dewey (1784-1867) of Williams College catalogued sedge-grasses in a series of articles entitled simply "Caricography," in the *AJS*. In vol. 10, 1826, the seventh article of the series included a lithograph of watercolors by Orra White Hitchcock. She was not named as the artist, but Dewey thanked her by naming a grass after the Hitchcocks: "*C[arex]. Hitchcockiana*."

⁴²⁵ Hitchcock, "Physiology of the Gyropodium coccineum," *AJS* 9, 1 (1825): 56-60. The lithograph of the plant, doubtless based on a lost watercolor by Orra White Hitchcock, was placed at the end of this volume.

Is not the mineral you gave me for spodumene rather scapolite? I am not much acquainted with them but Dr. Webster has sent me specimens exactly similar which recalls scapolite.

Yours most truly & with the best wishes,
B Silliman”

BS to EH, Box 3, folder 39

“New Haven July 27th 1825

My dear sir,

I have been compelled by unavoidable exigencies to delay till now answering your letters of May 30th & July 12. As to a professorship my impression is that if your duties are reasonable in extent & your compensation such as to excuse you from the necessity of doing extra duty in order to earn money to live, & also such as to permit you to spend your vacations in recreation, at least as far as it shall proved necessary, that then your chance for lasting would be as fair as any where. My health was destroyed by the pressure of twice the amount of labour which I ought to have encountered & much of it undertaken to eke out a deficient salary. The proposition before you requires too much. I have no hesitation in saying that if you undertake all that is proposed & go on with your usual zeal, you will not last long. If they will absorb the parts thus – Nat. Philos. & Nat. Hist. – or Chem^y & Nat. Hist^y & with no other recitations than those which are necessary to review & fix the subjects which you teach, you may then go forward comfortably, although in my opinion Chem^y Min & Geol are quite enough without super adding Botany, or, Natural History alone is enough without anything else. Let me impress upon you the importance of not being in any way induced to undertake too much. A Chemical course while it is going on is a complete engrossment of all your time & all your powers & I would never undertake again to teach any thing collaterally with it.

As to undertaking a couple of chemical demonstrations without a previous apprenticeship in the practical part, I must say that I think you would meet with much embarrassment & lose much time & expense which must be saved by going through with an experienced person and your standard of excellence would probably be lower. Should you conclude on any such arrangement you need not be afraid that I should do every thing in my power to aid you as to your relation to your people. I should be very sorry to do any thing to impair the cordiality or destroy the permanence of a connexion which I understand from Mr. Morey & others is highly useful & agreeable & I should hesitate much as to the course of duty, unless there is really a prospect of your obtaining better health & moving in a more extensive sphere of restfulness. On this topic I confess myself unable to form a decision. I believe your services particularly valuable in your parish & in your community especially in the present crisis of religious controversy. I do however believe that you would excel in scientific pursuits &, other things being equal, I could wish you to be placed in a situation to indulge your peculiar powers with action. Should you adopt the semi-agricultural plan & the semi-scientific, I would most cheerfully aid you in procuring a proper situation as far as might be in my power. As to your analysis of Dr. Macculloch’s classification of rocks I should be glad to receive it for the Journal provided you can prepare it without injury to your health & not otherwise. It is true that the establishment of several Journals has contributed to curtail the communications to mine, especially from the great cities, & I really cannot feel as if the production either of # or copied Journals would compensate for the failure or for the crippling of one, which with a little more effort in its favours, would be to the nation what the North American is in literature. Had all those who ought to have been the friends of the Am. Journal done as much as you have, or been as true to it, it would not have been at this time a question whether it could be sustained & were all who profess to be friendly really so, I should not have occasion for the distrust which I sometimes feel. As to the Spodumene I am very confident that Mr. B[torn loss]en has written to me that he has extras [torn loss] the lithia from that of Goshen & I thought that the fact had been published but do not find it in the Journal. The topaz I should be glad to see more of, & will do any thing in my power to ascertain. I think most certainly it cannot be the emerald. The sibrolite I am not very familiar with, but according to my impressions of it I should never suspect the Sillimanite to be it⁴²⁶ & certainly there is no analogy between the very extraordinary proposition as to contributions for the Boston Journal & cannot think it quite a dignified course.

You observe we have lost Mr. Dutton, a severe calamity to us & his family. Nothing has been done yet respecting a successor.

Hoping that your health may soon be restored, I remain my dear with the best wishes for your welfare,
very sincerely your friend,

B Silliman”

⁴²⁶ Sibrolite is now considered a variety of Sillimanite.

BS to EH, Box 3, folder 39

“New Haven Aug 6 1825

My dear sir,

On the 28th last I wrote to you on the subject of your change of occupation &c. & I now wish to call your attention for a few moments to a topic connected with this. You mention that overtures are made to you both from Amherst and Middlebury. Of course one of these places at least will be at liberty as far as you are concerned & both should you conclude to remain where you are. We have a young man here, Mr. Alex Twining, whose term of engagement with us is nearly out, & whose qualifications in Mathematics & Physicks generally are of a very high order & probably equalled [sic] by those of very few men of his age. He was a favourite of Prof. Fisher who thought very highly of his talents & attainments & indulged the most favourable anticipations of his future precepts. In his habits of mind as regards science he is indeed very much like Prof. Fisher, proportionately fond of science – acute – accurate – rapid & neat in his researches – learned in every thing related to the topicks [sic] above mentioned & holding a high rank as a general scholar with the advantage of two or three years at Andover, one here as a resident graduate in immediate connexion with the late Prof. Dutton as his assistant & of two years employment as a tutor. His age is I believe about 24 or 25, his health remarkably good, his temper amiable & cheerful, his person & manners respectable & gentlemanly & his devotion both to science & to other interests of learning as connected with its Institutions such that I have no doubt that if favourable situated he would rise to the first eminence.

Then why not obtain so remarkable a young man in his own Institution to fill the vacancy now existing in it?

His name has been mentioned & undoubtedly would command serious attention were it not that the prospect is in his own country. He is a native of this city & the people here have seen him grow up from childhood, as it were, in a few days, & what is more to the point still, his father although an excellent & most useful & trustworthy & capable man, is unfortunately unpopular from peculiarities of manner which however lean (rather too implausibly perhaps) to virtue's side, for it is his unbending integrity & his unbending manner of showing it, that more than any thing else, have produced the unpopularity which attaches to the father & has also although very indefensibly descended to a degree to the son. Owing more to the influence of feeling & opinion in this town than to any other cause, Mr. Twining has been at times made the subject of undefended odium & of petty & unreasonable criticisms which in my opinion would not have been made in another place & which were he established in another institution would not follow him there. This is all the draw back that there is in his case & were it not for this he might be retained here & very possibly would be, as a professor & with high advantage.

I know his wishes for a scientific employment & have volunteered this communication without his knowledge. If you can use it for his benefit & that of the Institutions in question you are at liberty [torn loss] to do it either with or without my name & I have no doubt that the President & Professor Ives [?] would unite with me in this recommendation as I know their sentiments to be the same.

I remain my dear sir as ever most truly & sincerely your friend,
B. Silliman”

BS to EH, Box 3, folder 39

[undated]

“I have been unable to sooner to reply to yours of the 23rd of Jan^y.

I did not much expect you to return; should you think it worth while to do so and this season & God spares my life & faculties I will do every thing I can for you with hearty good will & am glad that you think I was desirous of serving you for, so I certainly was, whatever may have been my ability to do so.

The topaz piece is in the press.⁴²⁷ Benjamin & I retouched it & on the whole I think it will not discredit you provided we are right in our main point as to the mineral. I confess I am not exactly at ease on that question although I cannot see what else it can be. It is however an obligation on which I am your endorser & if you fail they will come upon me. I am so much pressed with the course (lecturing every day) that I have done nothing about the lithia but will try before the piece is through the press which will be yet some days.

My nephew will write you about the articles of apparatus. Shelton has made the apparatus for fluorspar & I think with his usual neatness & ingenuity. I fear it is too large – if so this is my fault & you may if you prefer a smaller establishment, return this to me & I will take it & procure you another. I was sorry to find that the air jars were 5\$ a piece. Mr. Hovey paid me. We have sadly been y worried here with the influenza. College has been a

⁴²⁷ While at Yale in winter 1825-26, Hitchcock collaborated with Silliman's nephew Benjamin D. Silliman in making a chemical analysis of a specimen of topaz. See their article “Topaz,” *AJS* 10, 2 (1826): 352-58.

great habitat & the Chapel in an uproar of coughing. I have a ## Clark of Louis^a very dangerously ill with the disease & a slight attack of it finished the days of our venerable mother Mrs. Trumbull, Mrs. Silliman's mother, but she died in faith & we cannot doubt has gone to inherit the promises.

Mrs. Silliman unites with me in affectionate remembrance to Mrs. Hitchcock & yourself. Excuse my vacant page [one side left blank]. I must now report to the sick bed of my poor young man. I remain my dear sir yours with respect & affection,

B Silliman

[P.S.] My respects to your good Prest."

BS to EH, Box 3, folder 39

[This letter is by nephew and signed "Benj. D. Silliman."]

"Yale College Feb^y 25th 1826

Dear Sir,

You will, I fear, think me remiss in the execution of your commissions, the result of which I hoped you would have received before this, but owing to my ill health during the vacation & consequent confinement to the house I was unable to attend to them until near its close. Mr. Chilton very readily complied with your requests but it was not in his power to have the articles prepared in time for me to bring them on with me. He promised me however that he would forward them to my care as soon as practicable & as they have not yet arrived I wrote him a day or two since requesting him to send them on without further delay. As soon as they arrive I will forward them to you together with the casks which are here & which I detain until I receive the others, as it will be safer & cheaper to send them all by one conveyance. I will as soon as I know the amount settle with Mr. Hovey for them as you request. Mr. Shelton has finished some apparatus for you which is in Mr. Hovey's possession.

There is a letter here for you postmarked from some part of Massachusetts which I will send with the other articles. The article upon the Topaz will be in the Journal which will be out in a few days.

I need not tell you how much we regret the necessity of your decision not to return to NH and hope that as soon as your Chem. Course is through you will be inclined to pass the spring & summer with us.

If at any time I can be of service to you either here or in NY it will afford me much pleasure to receive & execute your commands which I hoped my Dear Sir you will not hesitate to send me at any and all times. Please give my best respects to Mrs. Hitchcock. Several of the students are quite sick & one (Clark from Lou^a) died yesterday of the Lung fever. The faculty are generally well. Mr. Olmsted has commenced his lectures and is much liked.

I remain dear Sir very sincerely your friend & servant,

Benj. D. Silliman"

BS to EH, Box 3, folder 39

"New Haven Mar. 20 1826 -- Y Coll. [sic]

My dear sir,

We congratulate you on the birth of another child & what I believe every good husband feels still more, the safety of the mother. I am aware that all danger may not be over during the first few days, but trust that every thing will go well & that Mrs. Hitchcock will soon be restored to comfortable health. You will present our very kind regards to her and accept them yourself.

Having an opportunity to send directly to Phil^a by Mr. Gibbs of this institution, I have him a \$5 note & desired him to obtain its worth in Potassium. He is hourly expected & I will commit it to M^r Hovey to be forwarded to you, as soon as it arrives.

I presume that ere this, you may have seen the Journal. As I have already said, I do not feel perfectly at ease about the topaz, but on examining its character as attentively as possible & comparing again with acknowledged specimens I cannot make it any thing else & believe it will so turn out, but we must expect close criticism; if it is not topaz I am quite confident it might be a new mineral which would be better than to have it turn out to be an old one.

The Journal is now come to a stand. Mr. Converse relinquishes the publication being about to remove to N York & it is soon to be decided whether it will live or die. I think it probable that in order to save it, I might take the thing on my own shoulders business & all but I cannot carry it unless the patronage can be increased or the expenses diminished. To make it safe, both these objects ought to be affected. Your friendly influence I am sure of & that of your institution I presume. I have an offer to remove it to Phil^a but there are many objections to that arrangement. As soon as any thing is matured I will let you know.

My nephew sends his regards & says that the two boxes of N York apparatus were sent three weeks ago to the care of Prof Hall [?] & that he (BDS) wrote you by mail about it.

Hoping that the return of spring may prove beneficial to your health, I remain my dear sir very truly your friend & servant,

B Silliman

[P.S.] Lane has been over & brought some specimens of topaz but promises to explore for more & come again when I trust we can send you some."⁴²⁸

EH to BS, Box 5, folder 14

"Amherst 21st March 1826

Sir,

To your kind favour of the 19th inst. I have been unable ere this to replay for want of time & now I have only a moment by a private conveyance. Some of us have been sick almost every moment since we came to this place & this with the hurly burly of moving here made my hands pretty full. Mrs. H. is now confined & has a little daughter four or five days old.⁴²⁹ She is comfortable as we could expect considering her previous indisposition & she desires to [be] affectionately remembered to your self & Mrs. S. The weeks we spent at N. Haven are recollected by us, I assure you, with a great deal of pleasure. The effect upon my health of returning to the north in the winter was bad as I expected it would be.

It was not till last night that I have been able to obtain the apparatus from Hartford which I obtained at N. Haven, although I have strained every nerve to get it up sooner. Of course I have yet done nothing in Chemistry. The only thing I now wait for is the articles your nephew obtained in N. York & which I have requested him to forward to the care of [torn loss] at Hartford as soon as received. You will [torn loss] me by naming the thing to him again [torn loss] made through him a request to you [torn loss] potassium which I would not have you com[torn loss] unless perfectly convenient. Should you [torn loss] to spare it, I will thank you to put it in with the N. York articles.

I have not yet received the Journal, and I almost tremble to see the topaz piece although I have made no new discoveries about it & can see no reason why it is not that mineral & many why it is; yet there is within me a sort of undefinable impression that it may prove something else. If I should fair however my loss would be but small: but if I should involve my 'endorser' it would be a sad affair.

I have many more things to say but have time only to second the expressions of gratitude & respect with which I am ever yours,

Edward Hitchcock

[P.S.] We have adopted Webster's Brande as our text book."⁴³⁰

EH to BS, Box 5, folder 14

"Amherst 18th April 1826

Dear Sir,

I this moment received the potassium you were so good as to send me: and while I feel very grateful for this act of kindness I cannot but be rather ashamed that I have made you so much trouble. At the time I wrote to your nephew on the subject it occurred to me I would write to the representative of Congress from this district & request him to call in Philadelphia & get the potassium & leave it with you on his return. But it did not occur to me how difficult it would be for you to lend me a particular quantity. I hope you will excuse the thing as one of my blunders.

It is really painful to me to hear of your dilemma in regard to the Journal. It ought not to be that you should be obliged after having gone through the very great labour of completing a decade of volumes without any pecuniary compensation. It ought not to be that you should now be compelled to take the whole drudgery & responsibility upon your shoulders. Are the public acquainted with the facts on this subject? Do they know how much it has cost you to sustain the work? Do they know that it has broken down your constitution, as I verily believe it has? If not, it seems to me they ought to know it. All that I can do to increase the patronage of the work you may depend upon my doing: but yet I am aware that I can do but little. In the midst of all the intelligence of which this region is so proud, it is very rare to find a man who is willing to pay \$6. dollars a year for any purely scientific work. I hope, not only for the sake of the scientific character of N. England, but also for the sake of her

⁴²⁸ From the evidence of these letters, "Lane" was a commercial vendor of minerals.

⁴²⁹ Catherine Hitchcock (1826-1895).

⁴³⁰ Webster 1826.

religious character that this Journal will not go to Philadelphia. For I do believe that when you take away any means of knowledge from a people you injure their religion if it be genuine. But if the [torn loss] of N. England will suffer such a work as the Journal to be taken from them, they deserve to be deluged with ignorance & superstition.

I received the last No. of the Journal just as I was commencing my lectures & have been so incessantly occupied since with them that I have read but little of it, not even your piece upon the anthracites. As Boniface [?] in the play says in regard to all I eat my chemistry & drink my chemistry & sleep upon my chemistry. Any experiments thus far have succeeded far beyond my expectations. Not more than one or two unimportant ones out of more than fifty have failed. The reflectors of radiant caloric although often worked admirably burning phosphorus as far as I tried them.

The saturated solution of Glauber's salts crystallizing suddenly on letting in the atmosphere I performed under crystallization & explained on the principle that the polarity of the solution was changed by admitting the air according to the Art. Crystal. The whole mass was instantly crystallized. The fusing mixtures & firing [?] by others succeeded well. Yet I have a multitude of difficulties to contend with. I have every thing to provide new & to patch up as much as possible and I come home almost every night as tired as a farmer. I am amazed that the gazometers & tubes connected with them were so wretchedly made by Shelton. I presume I found not much short of fifty leakages in them & I believe some of the tubes must be given up. The phosphorus put by for me by Hotchkiss was miserable stuff, being covered over with -- what? -- I have you to say for fear I shall make a mistake & the water [?] in which it is contained is converted into acid. My diff. thermometer & one air thermometer were broken in coming from N. York. That I am able to get along at all with so many difficulties I impart [?] almost entirely to your instructions. Those I follow almost without an exception, and two or three of your maxims I have always in mind such as -- do not attempt more than two lectures a week -- never try an exp. before a class which you have not tried beforehand and which you are not sure of success. I find however that my health rather fails under my efforts. I hope to have wisdom to favour it & to get along.

Mr. Hovey will I presume hand you the money for the potassium. If he does not I will send it by him when he returns after vacation. I will do the same in regard to your nephew (to whom I desire to be remembered) if Mr. H. does not settle with him for the articles from N. York. If Lane [?] should bring a number of specimens of topaz, I should be glad to get some. I have not much faith however, that you will get many out of him. Has any thing yet been said in the papers about our discovery?

Mrs. H. is gradually mending through the favour of kind Providence and she wishes her respects to be forwarded to yourself and Mrs. Silliman. We hope to have an opportunity ere long to return your congratulations.

Is the copy of Buckland's Reliquiae Diluvianae belonging to the Geolog. Soc. now at N. Haven? And if so will it be consistent to loan it to me some time next summer should I get upon geology? [sic]

They have commenced digging for the new chapel here. After all the Laboratory is to be put partly under ground. I have warned them as loudly & plainly as I can: but they feel too poor to put up a separate building. I hope however by urging them still more to get it nearly all above the soil.

I remain truly & respectfully your obedient servant,
Edward Hitchcock"

BS to EH, Box 3, folder 39

"New Haven May 3d 1826

Dear sir,

Yours of April 18th is received. Mr. Hovey paid me the 5\$ for the potassium & any apology is entirely unnecessary. I had an opportunity to send to Smith without the least inconvenience.

Jane has written that he has found topazes as transparent and beautiful as those of Saxony. We wrote that he must send them over but none have as yet come. I have seen no notice of the paper on the topazes from any quarter at which I a little wonder & Webster in a private letter written since the Journal was in his hands says nothing about it. Mr. Cotton at Monson [?] has Buckland. You had better write to him immediately (by my authority) & ask him to send you the book, as he has had it these six months or more. Write soon or he may send it back first to New Haven. I am glad that your experiments succeed so well & that you find my suggestions useful. Mrs. S is well as yet & unites with me in affect^e remembrance to yourself and Mrs. H.

The Journal is to be published by Maltby & Woodward at their risk & I expect that the next No. will be out early in June.

In much haste, yours very truly,
B Silliman"

BS to EH, Box 3, folder 39

"NH. May 22 1826

My dear sir,

I am going directly with Prof Abbott & his brother to view the colleges & in the mean time prepare a hasty reply to your letter with the sketch of the laboratory. I think that you have disposed of your space in the best manner & do not see any thing very important to suggest it. As your room is so low that your seats cannot rise much, would it not be well to let them be upon the floor & raise your own area some 2 or 3 feet taking care that your tables cistern &c are as low as they can be & allow of being reached with convenience.

As to the tubes through your office & apparatus room: I do not think that they will materially injure the draft provided they enter flues which rise to the top of the building without being connected with any other flues.

I have two letters from Dr. W since I wrote. He continues silent about the topaz & has never even asked for a specimen. Lane has not yet sent over his new specimens & I fear he will not before it is too late for this No. of the Journal now in the press.

My health is pretty good for me but I have had no relaxation from duty, not having stirred from home nor expecting to do so until my geological course is finished. There is no change as yet in my family. With my kind regards to Mrs. Hitchcock & Mrs. Silliman's also, I remain dear Sir very truly your friend & servt,

B. Silliman"

EH to BS, box 5, folder 14

"Amherst 8th July 1826

Dear Sir,

Mr. Gotting [?], author of a treatise on Chemistry, has issued proposals for republishing an English paper entitled *The Chemist* (of which I send the first No.) and at the head of the subscription list stand the names of Drs. Webster and Gorham. I stated the fact to Dr. Webster & he says his name has been forged & moreover says Mr. Gotting [?] served you in a similar manner some years ago. Mr. G. says some one else obtained Webster & Gorham's names for him & he knows nothing about any forgery. He states also that he knows nothing that Dr. W. means in regard to his treatment of you. If you have no delicacy on the subject will you inform me to what he refers? Will you also give me your opinion concerning the merits of the '*Chemist*' and state whether it has stopped in London? Dr. W. says it has 2 years ago. I am in doubt what course to take in regard to this business. I cannot encourage it much with my present views nor do I feel satisfied it is my duty openly to oppose the publication.

Co. Graves who sent you some years since an account of a gelatinous meteor seen in this place⁴³¹ sent to me the other morning to come & examine another which had fallen the preceding night. I went & found upon some old chips a yellow gelatinous mass a foot in diameter appearing as if it had fallen there. I very soon however recognized it as a species of fungus which had grown up the night previous & on examination found its surface to consist of a membranous covering full of irregular cavities like an *Helvella* with a pulpy substance beneath. I could not persuade the Colonel it was a fungus: but I told him to examine the place again, and before night two or three others came up & settled the question. There is not the least doubt that the gelatinous mass described by Col. Graves in the *Journal* was precisely the same thing mentioned above as the Col. & all who said it testify. Thus endeth the chapter on Amherst meteors.

I closed my chemical course yesterday. Over the latter part of the subject I hurried rapidly and if Providence permit I hope to attend the last part of your course that I may be better prepared in future. I worked hard & incessantly but was amply repaid by the almost uniform success of the experiments: and I have reason for thankfulness that I have gone through without receiving scarcely a scratch. I could not succeed in distilling any of the strong hydrofluoric acid. The difficulty seems to be that the apparatus made by Shelton is too large as was proved by the fact that on turning a small quantity of water into the jar containing the materials I obtained acid full strong enough for etching. I think of cutting off about half of this jar. Notwithstanding the extreme hot weather my health has held out better than I expected. I find that one day's preaching injures me more than a whole week's work in the laboratory.

Would an edition of Buckland's *Reliquiae* sell in this country if reduced in size & style so as to be afforded at one or two dollars? Is there a second edition for sale at Howe's bookstore?

⁴³¹ Rufus Graves, "Account of a gelatinous meteor," *AJS* 2 (1820): 335-37.

I heard sometime since that Mrs. Silliman's health was feeble. How is it now? Our new chapel building is progressing. No news.

Yours respectfully,
Edward Hitchcock

[P.S.] I have not yet received a No. of the Journal for the present season though I suppose it must be out ere this."

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania

"Amherst 4th October 1826

Dear Sir,

Mr. Charles U. Shepard of this town, who has recently been elected professor in a new Medical Institution about to be established in Vermont, and who is a candidate for the professorship vacated by the resignation of Dr. Dana, at Dartmouth College, would be glad to spend the next term with you in your laboratory.⁴³² And my principal object in writing at this time is to enquire whether you can consistently grant him the same liberty you gave me the last winter, of taking a peep behind the scenes, and witnessing your chemical manipulations. Mr. Shepard, I believe, is advantageously known to you, as the author of several mineralogical notices in your Journal. He has been giving lectures on natural history in Boston the past season. You will find him ardently devoted to physical science, and I think you will be pleased with his gentlemanly & amiable deportment. By addressing a line to me or him, on the subject, you will confer an obligation.

My journey to N. York was rather unpleasant on account of poor health & excessively hot weather. I accomplished, however, the principal objects I had in view, and returned by the way of Albany.

I hope, by the leave of Providence, to commence lecturing in chemistry in a week or two in the new laboratory, which is approaching to completion. I find there is no end to the labour of fitting up the rooms.

Respectfully yours,
Edward Hitchcock"

BS to EH, Box 3, folder 39

[Written on blank pages of a prospectus for the AJS, an appeal for subscribers.]

"NH. October 6 1826

My dear sir,

My sincere belief is that Mr. Shepard could find in Dr. Hare's laboratory⁴³³ a more elaborate & full course of chemical labours with more finished manipulations than any where else in this country & my advice to him would be to go to Phil^a especially as many incidental advantages would result from a residence there. I will not however be incourteous if he should wish to come to New Haven & will do all the good in my power although in the multiplicities of the laboratory it is desirable to have no more than can be usefully employed.

You see I have been stating the case of the Journal intending to have one of these put into every copy of the No. that now goes out. I do not wish to give you any trouble with the subject any farther than to furnish you with facts.

I remain my dear sir with kind regards to Mrs. H, yours very truly,
B Silliman"

BS to EH, Box 3, folder 39

"New Haven June 1 1827

My dear sir,

I will thank you to keep sight of the enterprise at S. Hadley that we have a statement of the facts for my next No. I shall presume what is in yours of the 29th but probably by the time the journal appears (September 1) the state of facts will be materially changed; what you have already mentioned is interesting & important but as I am sure that you & Dr. Morse [?] will still agree to band together, you may as well go that way occasionally as

⁴³² Charles Upham Shepard (1804-1886), a graduate of Amherst College, was a joint protégé of Silliman and Hitchcock. He was successively Silliman's assistant, lecturer at Yale, professor at South Carolina's Medical College, and at Amherst, professor of chemistry and natural history from 1847 to 1877. Beginning in 1832 he wrote widely on mineralogy, and his major collection of minerals was a mainstay of Amherst's scientific instruction.

⁴³³ Robert Hare (1780-1858), professor of chemistry at the University of Pennsylvania, friend and associate of Silliman's since their student days together. He was a notable inventor of early electrical devices and promoted the use of the oxy-hydrogen blowtorch.

any other & give me report of what is doing.⁴³⁴ There is something very remarkable in that water-spouting noticed in my March No.; it is too frequent to be accidental & probably depends on general causes – aerial I presume at least in part.

I am very glad to hear that your health is so much better but I am sure that you could not have been quite done over at New Haven or you could never have written that energetic description of weakness, & drawn that animated & bright picture of gloom & darkness which you gave us in the Christian Spectator. It was very well done but it almost persuades me that I was only a borderer upon the domain of dispepsia [sic] & that I never penetrated into the heart of the empire.⁴³⁵

I thank you for the crystalized maple sugar which however I have not yet seen – but I shall be very glad to put it into our collection of sweets especially as chemistry is so prone to acidity. Mr. Shepard has already labelled a great many of our bottles. Two more Hitchcockiana & I am so much pleased with it that I must request you to secure me a little of the sulfate of barytes when you have an opportunity & to give me a notice of his very neat & permanent mode of labeling & of your influence in using this material as a pigment also. You see I put you in requisition on several subjects. The price you mention for galvanic apparatus is cheap but it would be a pity to put in that thin zinc. I have written to Phil^a for some of the thicker kind of rolled zinc but would have such small plates as you propose to have cast in preference. I am very glad you are going to give an abstract & review of Mr. Olmsted.⁴³⁶ It well deserves it & you can use the siphon to aid you in abstracting which I hope you will do copiously & for the next No.

Such a course as you mention on natural history would be very interesting & probably our paucity of means & time have prevented it being done.

In much haste yours very truly,
B Silliman”

BS to EH, Box 3, folder 39

“New Haven July 28 1827

Dear sir,

I thank you for the supply of sulphate of barytes &c which you mention that you have forwarded to the care of Mr. Brace. I have not yet sent for them but will direct one of our waggons to get them.

I forgot to mention to you that Moldenhauer has now relinquished his connexion with the mineral comptoir at Heidelberg & his successors are David & Adolph Zimmerman. If you do not obtain the catalogue I believe I can find for you another among my papers.

If you are able to get your communications ready for the No. of the Journal which will come after the present one so that I may have them in October it will answer. The present No. is nearly half done & will be out punctually September 1, the next to follow (I trust) Decb. 1. I see no difficulty in making a pneumatic cistern entirely of metal & in that case you will probably let a tube for a chimney pass through that you may have a draft for your fire, otherwise you may be annoyed by the gasses & the heating will be imperfect. I should be shy of brick [here a very simple pencil sketch] & mortar unless it was merely to support the metallic sides & perhaps a wooden frame would do better for that, or the form might be elliptical which would support itself. I know not of any source for water proof mortar in this country except the hydraulic lime of N York & of Southington Count.

I will request Mr. Shepard to put you up a specimen of the Glauberite & remain my dear sir, yours as ever,

B Silliman”

EH to BS, Box 5, folder 14

[Envelope fold above address: “By Mr. G. White”] “Amherst 28th October 1827

Dear Sir,

This introduces to your notice Mr. George White, my wife’s brother, who goes to N. Haven to attend the Medical Lectures. He was my assistant through two courses of Chemical lectures and Mr. Eaton’s through five: & two others -- one of Mr. Eaton’s & one of Prof. Dewey’s he has attended -- making nine courses in the whole;

⁴³⁴ This apparently refers to a missing letter from Hitchcock.

⁴³⁵ See Hitchcock, *Dyspepsy forestalled and resisted* (Amherst 1830), a book on temperance.

⁴³⁶ Hitchcock (anonymous), “Notice of the Report on the Geology of North Carolina, conducted under the direction of the Board of Agriculture; by Denison Olmstead [sic], Professor of Chemistry and Mineralogy in the University of North Carolina [in 1824 and 1825],” *AJS* 14, 2 (1828): 230-51.

such as we give. But I trust it will be profitable nevertheless to attend yours. You will find him I think very well acquainted with chemistry & also with natural history. He is very modest & retiring however & will say but little unless it be drawn from him. His pecuniary circumstances are such that he will probably need credit for a time if that is ever your custom: As however he does not know how the business should be conducted he has not obtained any bondsman. But after going to N. Haven & learning what is wanted he means to send back the instrument to get the signature of some responsible person who will be perhaps myself or his sister.

Some apology may be due for the French leave I took of N. Haven at Commencement. The truth was my lectures were to commence the next week & I had a great deal of preparation to make & I thought it best to get home as soon as possible. Since my return I have been incessantly occupied with lectures and recitations & have got pretty well advanced in my course. The gentlemen here press me into quarters so narrow that I am obliged to labour for a time harder than any man with my constitution ought to do. I send you a little abstract of my recitations & lectures prepared since I commenced instruction this term in order to try the method of instruction by subjects rather than by pages of a text book. So far the plan has succeeded finely. I regret however that I could not spend more time upon the Abstract.

In a little more than a fortnight I shall have a vacation & hope then to be able to make out an account of Prof. Olmsted's Geology of N. Carolina & also some little notices of my mineral tours the past summer. But I fear I shall be too late for the next No. of the Journal. Indeed I have heretofore broken my promises of the kind so often that by this time I presume you do not place much dependence upon them. The typography of your last No. of the Journal I perceive is much improved. But this is as much as I can say as I have not yet found time to read it.

I can get for you if you wish iron filings at Springfield at 10 cents per pound for any quantity & if you want as much as a hundred they will come at only six cents. I mention this because I know you have been in the habit of giving much higher. I got at Lane's one mass of topaz nearly pure weighing 26 pounds & this was only a part of the original mass. I obtained also a large number of small crystals. I think him quite reasonable in his charges.

The box for Germany is not yet packed though the specimens are laid out. I mean to send a large & very good one. I hope to get it out this fall.

Please to remember me and Mrs. H to your amiable & happy family & believe us respectfully & sincerely yours,

Edward Hitchcock"

[On verso, in pencil] "To the Medical Professors. Gentlemen. I wish you would accommodate Mr. White as regards his fees. His case is a very meritorious one as heretofore explained to me by Prof. Hitchcock & deserves indulgence. Yours, B. Silliman, Nov. 1, 1827."

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania

"Amherst Nov. 30th 1827

Dear Sir,

I have just packed a box of minerals for you which I shall send down the river as soon as possible, probably in a few days, directed to the care of Thos. Th. Brace Esq. whom I shall request to keep them until you call for them. It contains from 30 to 40 specimens but as they are all labelled it is unnecessary to be more particular. If you can furnish me with any of the Haddam minerals even more than one specimen of a kind or of foreign specimens, they would be very acceptable.

I thank you for your ingenious Address before the Agricultural Society. I may be able in a few days to reciprocate the favor, so far as pages are concerned: as an address I recently delivered has been called for.⁴³⁷

In haste yours sincerely,

Edward Hitchcock"

EH to BS, Box 5, folder 14

[On envelope fold above the address "By Mr. C. Möller" On verso fold in Silliman hand, in ink, "E. Hitchcock. Answered by Mr. Shepherd [sic] from verbal instructions." "Amherst 30th Dec. 1827.

Dear Sir,

The bearer is Mr. Charles Möller whose name you will see on our Catalogue as instructor in modern languages. He now leaves us however in consequence of some dissatisfaction in his class which rendered it difficult to proceed with success. We are satisfied that Mr. M. has not failed through an imperfect knowledge of

⁴³⁷ Hitchcock, *Scientific agriculture, an address delivered before the Hampshire, Franklin, & Hampden Agricultural Society; at Northampton, Oct. 24, 1827* (Amherst 1827).

the languages he was called to teach for there can be no question but he is well versed in French Spanish German Danish &c. Nor has he failed for want of a disposition & effort to succeed. But partly we believe from not being acquainted with the modes of instruction in American Colleges & partly from his previous habits of life which have been diplomatic & mercantile. The gentlemen who have been under his private tuition speak well of him in that capacity & he seems to possess honorable feelings. We feel solicitous for his welfare as he is a friendless foreigner. He was born in Norway & has resided most of his life in various parts of Europe & S. America.

Mr. [George] White has mentioned in his letters that you would answer my letter sent by him as soon as the pressure of lectures was over. I do not recollect that there was any thing in that letter that particularly needed a reply -- indeed I have forgotten what it contained. I have however a few enquiries to put at this time which I should be very happy to have answered if you can do it by Mr. Shepard when he comes to Amherst.

I am constructing some galvanic apparatus and among other things a Calorimeter. [sic] But I can not satisfy myself as to the mode in which the plates are attached to the frame of wood around them and to the tin (or zinc?) bars crossing the top. Will you be so good as to request Mr. Shepard to examine your Calorimeter before he comes up so as to be able to inform me as to these points? If I use plates a foot square how many will it need to make an instrument of size sufficient to exhibit its powers respectably? As to Cruikshanks troughs: would there be much use in constructing the trough double after Dr. Hare's plan for pouring the acid off & on? Do you know whether the apparatus of Dr. D. [?] Butts with semicircular plates answers a good purpose? Since I began to cast my zinc plates (a troublesome business by the way) I find that Dr. Hare objects strongly to them as being liable to unequal corrosion on account of their crystalline texture. Have you had any experience with cast plates? If one has a Calorimeter & deflagrator would not common batteries answer equally well with small plates for exhibiting decompositions & shocks to a class -- say plates from 2 to 4 inches? Can you give me any hints about cementing the plates into the trough that would assist me? I shall not attempt to make a deflagrator this year.

I am engaged in painting my tables cisterns tubs &c in the Laboratory with sulphate of barytes. As I did not care about having the paint very white or very fine I made no preparation of the barytes except to have it ground in a gypsum mill & then I mix it with drying oil & put it on just like the white lead. I think it will answer extremely well. Should you like some of the barytes prepared in this way to make the experiment I will send you some by Mr. Shepard. I shall hope also to send by him a sort of analysis of Prof. Olmsted's Geology of N. Carolina for the Journal. It will occupy but a few pages & I hope if you think it worthy of insertion it may appear in the next No. I intend also to forward some miscellaneous notices of minerals.⁴³⁸ I am glad to find that you get time to enter so largely into the subject of volcanoes. I shall look for your farther thoughts with much interest.

I am preparing a mercurial cistern of soapstone. I think it will answer an admirable purpose. I make use of one face of the block also for casting zinc plates with almost entire success. All these processes I carry on with my own hands our college is so poor. My health has been better the past fall than usual except that I have had a serious attack of colic from which I am just recovering.

Myself & some others here have got considerably interested in the French language of late & I wish to persuade them to subscribe for the Revue Encyclopedique. As they have never seen the work you would much oblige me if you can loan a number for a few weeks & send it by Mr. Shepard.

An Agricultural Address of mine is just printed. & I will send you one as soon as I can lay my hands on it. Sometime since I saw a notice in one of the public papers that I was elected an honorary member of the Phi Beta Kappa of your College. Is this a mere hoax or not?

I perceive an advertising notice is abroad stating that Comstock's Mineralogy is used at Yale & Amherst Colleges.⁴³⁹ Ought we to take any measures to correct the statement?

Very respectfully yours &c,

Edward Hitchcock

[P.S.] Do you know of any foreigner who could answer for an assistant instructor in French & Spanish in our College? We want one soon."

EH to BS, Box 5, folder 14

"Amherst Jany. 21st 1828

⁴³⁸ Anon. (Hitchcock), "Notice of the report on the geology of North Carolina, conducted under the direction of the board of agriculture; by Denison Olmstead [sic], professor of chemistry and mineralogy in the University of North Carolina," *AJS* 14, 2 (July 1828): 230-51. Hitchcock's review of Olmsted was accompanied in the same issue with his "Miscellaneous notices of mineral localities, with geological remarks; by Prof. Edward Hitchcock," *AJS* 14, 2 (July 1828): 215-30.

⁴³⁹ J. L. Comstock, *Elements of mineralogy, adapted to the use of seminaries and private students* (Boston 1827).

Dear Sir,

If you insert the communications I send in the Journal you are at liberty to strike out such portions as you think proper. I wish the Review [of Olmsted] to be nameless. You will see I have not copied the extracts I have made but enclosed them in a pencil mark in the work itself. The copy I send belongs to the Geological Society in whose collection I will thank you to deposite [sic] it when you have done with it.

I thank you for the information you have communicated relative to the galvanic instruments. It has enlightened me on some points of importance. I find the construction of these instruments to be a great undertaking with the little assistance I can derive from any of our artists.

The barytes I do not send because Mr. Shepard cannot carry it. I will endeavour to send you a quantity in the course of the winter.

The cold weather does not agree with my health & I seem to be getting into the wretched state in which you saw me last winter but I am struggling with all my might against it.

Yours as ever,

Edward Hitchcock

P.S. I shall take the liberty to retain for a time the two Nos. of the Revue Encyclopedique you sent me as most of the gentlemen whom I wished to see it are out of town."

BS to EH, Box 3, folder 39

"New Haven Mar. 10 1828

My dear sir,

I have been this winter a poor correspondent & must beg your pardon for my silence, but you know how many cares I have, in the winter especially, & this winter they have been increased by my attempting to get a text book into shape for my class. I persevered till January, since which time I have been obliged to suspend the work. I hope soon to resume it & to have it ready for my classes next fall.⁴⁴⁰ Dr. Howe [?] has been doing the same thing, as I recently find, but he is ahead of me as his work is already most of it finished. I believe however that we have taken somewhat different directions & that there will be no interference. Indeed there could be none in any event as both are chiefly text books.

I am glad you have succeeded with your galvanic instruments. Mr. Shepard tells me that you have done very well.

The April No. of the Journal is just receiving its last touches. You will be puzzled to find that your pieces are not in it. This was occasioned by the late arrival of Eaton's Report & the account of the Welland Canal to both of which I was pledged. Your communications shall however appear in the July No. There is a review of Mr. Olmsted's Geology in the Southern Review, a new one lately started in Charleston So. Cara. I am told it is crowded (for although I have the work & have been unable to read it) & I presume that it will not render the appearance of yours nugatory; should I think otherwise on perusal I will inform you.

Your friend Mr. White has acquitted himself well during his course of study & at his examination. This department has been very amiable but I could never get him within my doors.

With kind regards of Mrs. S. & myself to Mrs. H., I remain dear sir truly yours,

B. Silliman

[P.S.] You mentioned to me that you had a new demonstration of polarization of light; could you send it to me with permission to insert it in my book should I think it appropriate to my design? Any thing that you have met with that is new would be acceptable for the same object."

BS to EH, Box 3, folder 39

"Brattleborough, May 26 1828

My dear Sir

Returning from the White Mountains with a few friends & not being certain that I can visit Amherst, I beg leave to name to you two of my companions & to request that you will put them into the way of seeing your Institution for which purpose they will make an excursion from Northampton.

The gentlemen referred to are Messrs. Cortland Van Rensselaer & Mr. John B. Church, the former are alumnus & the latter a member of the senior class in Yale College. They are young men of the most respectable & estimable character & their friends are of the same description.

⁴⁴⁰ The text book awaited two more years: Silliman 1830-31..

If you are engaged they will not wish any thing more than that you should place them under the protection of some gentleman connected with the College.

I remain my dear sir, with great regard, yours very truly,
B. Silliman.”

BS to EH, Box 3, folder 39

“New Haven June 4 1828

Dear sir,

I wished to visit you in my late tour but could not conveniently do it & must reserve that pleasure to another opportunity. The direction formerly given by me was copied from a letter in which it was so obscurely written that I was not sure I made it out correctly. Have I yours amended directions correctly -- viz Messrs. Concleve D. & M. P. Brantz?

Fulminating silver I always divide into small parcels of a grain or two, on separate pieces of paper (card is the best) & the crushing is done principally by gentle trituration with the filaments of a feather. I hope you will not repeat the experiment with the knife & the glass which I should think very hazardous & you got off well that you were not seriously hurt.

I cannot resume my chemical text book till I am through with the geological lectures. From that time on till it is finished I hope to make it my chief employment & I hope to get the first part making half a volume done in time for my pupils # & the other half by the time it will be wanted. My object is my own pupils to enable them to follow advantageously & intelligently my own course of instruction & to recite it. A new elementary work is not needed for the science or the public.

My precise object now is to request you in turn to aid me in this way. You know my course mode of teaching & illustrating &c. My effort will be to put my pupils in possession, in terms of the greatest brevity that is consistent with perspicuity of the leading things in the science & in my course & I shall include as much as possible of the applications to the arts & common phenomena. Now be so good as to put down from time to time such things as occur to you as corrections, additions or modifications & I shall give them full consideration.

I will mention your cisterns but wish more precise facts & will not forget the sulphate of barytes.

I do not propose to have many cuts, a few in wood here & there.

I thank you for mentioning the works on natural history & congratulate you upon the birth of a son.

Hoping that both he & Mrs. Hitchcock may do well, I remain dear sir, yours very truly,

B Silliman”

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania

“Amherst June 27th 1828

Dear Sir,

You have not yet got the direction for the agent of the Messrs Timmens [?] exactly right. It is Messrs Coudere # & M. Brants, Amsterdam.

If I can get time it will give me pleasure to send you drawings of the cisterns in my laboratory and the notes upon some other things which I alluded to in my last letter. Indeed I had thought of offering something of the kind for your Journal. But then considering that I am so much of a novus homo in these matters I thought probably I should not render much assistance to the science. I have just had a search for arsenic in cider brandy suspected to be poisoned. Carbonate of potash & sulphate of copper gave a copious precipitate of what appeared to be Scheele's green, and nitrate of silver threw down a white or slightly yellowish precipitate. But upon a careful trial of all the other experiments pertaining to this subject I became satisfied that no arsenic was present. I could not get a particle of metallic arsenic nor the alliaceous fumes. On putting some ginger into cider brandy it gave the same precipitate as the suspected brandy with the cupreous reagent. Hence I suspect that ginger is all the poison in it as I tried for # sublimate lead & copper.

I have heard that you have an invitation to visit the anthracite region in Pennsylvania to examine it geologically. Shall you go? and at what time? & if you go should you like my company? I have long had my eye upon that region & as my health is suffering more than usual this season perhaps I could get away to accompany you if it would be pleasant to you. If you do not intend to go you need not trouble yourself to answer these enquiries.

I have just received from Prof. Cordier of Paris an interesting memoir on the temperature of the earth in its interior. I have read most of it & find it extremely interesting. I do not see but they will make out that we live

over a mass of liquid fire. I presume that you have received the same work & I hope you will let an abstract of it appear as early as may be in your Journal. Its bearing upon geology & some other sciences is very important.⁴⁴¹

I am now carrying on lectures on Botany & Mineralogy. I find it much easier to interest the class with the former than the latter. Probably if I had your cabinet I should find it different. I wish you would say to Mr. Shepard that I have not yet found time to visit Goshen & Chesterfield or to make an further trials upon the peculiar ore I found in Goshen nor upon the stilbite ? [sic] from Deerfield. If he has time I should like to know how he gets along with his Columbian from Chesterfield.

Very respectfully yours,
Edward Hitchcock”

EH to BS, Box 5, folder 14

“Amherst August 7th 1828

Dear Sir,

I take the liberty to interrupt you long enough to attend to an enquiry I have to make in relation to a particular mode of whitewashing which I understand you have used. It is made by using skimmed milk instead of water to mix with the lime & if desired to give it a yellow tinge by adding either sulphate of iron or French yellow. It was mentioned to me by Prof. Olmsted and I have used it the present season quite extensively upon wooden buildings. But the enquiry I wish to make of you is whether it answers well for brick and stone buildings as I was told you had employed it upon your house. We should be glad to have our colleges painted white especially the new one, but are too poor to do it with oil paints. Any information you can give us in relation to this whitewash will be very thankfully received.

The Junior Class in this College have translated and are printing the Essay of Prof. Cordier which I mentioned in my last letter.⁴⁴² It will be out in two or three weeks in a duodecimo of 90 pages and the class will present you with a copy. Although Cordier’s theoretical views may not entirely coincide with your own yet I think you will be pleased with the able manner in which he has discussed the subject of subterranean heat and with the great mass of facts he has brought forward to prove an increase of heat in the earth in descending into it. Will you admit into your Journal (the next No.) a short abstract of this work? or will you give some account of it yourself? In either case if you are pleased with the execution of the translation a few commendatory remarks from you would be received with thankfulness by the class and might help them to sell enough of the copies so as not to make the expence of printing very burdensome. I set them about the business in order to excite some interest in geology which drags rather heavily in this college. I assure you that the labour of making the translation is not small particularly as there are so many results to be changed from French weights and measures into English.

I suppose you are progressing with your work on chemistry. When will you print it? Shall you permit it to be used in other institutions besides Yale?

Why can you not break away from your studies long enough to come & attend our Commencement? We should all be happy to see you & doubtless the ride would promote your health if the performances did not gratify your taste.

Respectfully & sincerely yours,
Edward Hitchcock”

BS to EH, Box 3, folder 39

[Written on printed announcement dated August 6, 1828, about dissatisfaction of Yale students with their board]

“Yale. Aug 8, 1828

Dear sir

It has not been in my power till now to say any thing definite as to the visit to Wilkesbarre. I have been waiting [sic] their reply to my letter answering their application. They will pay my expenses & nothing more, but the thing is so desirable in itself that I think -- providence permitting -- I shall go. It cannot be till after our commencement which is on the 10th & for any thing that I now see I might start within a day or two of that. My purpose will be to visit not only Wilkesbarre which is the subject of my invitation but the Schuylkill, Lehigh & Laxawanna [sic] region & if it had been possible to push the jaunt to Pittsburgh & see the bituminous coal, I should have wished it, but there will not be time.

⁴⁴¹ See Hitchcock to Silliman, 8.7.28.

⁴⁴² Cordier 1828. “Done nominally by the Junior Class—but I had to go over the whole to prevent mistakes:” Hitchcock 1863, *Reminiscences*, p. 386.

As to your company and assistance I should prize both very much & I would apprise you thus early that the result of your observations may appear in the Am. Jour.

Let me hear from you whether you can go at the time proposed. It might be made later but I think I could not make it earlier.⁴⁴³ Cannot you obtain leave of absence for a few days should your term commence before our return. Your journey would be of great use to your pupils.

Mr. Shepard is not yet returned from Quebec; he has been gone four weeks.

Dr. Cooper has been here & passed two days; he took of me Cordier's very interesting memoir & volunteered to 'get it' as he termed it & gave me the quintessence for the Journal, I hope the No. now in the press.⁴⁴⁴ The new No. is going on in the works [?]. If you have any thing don't let it be long in coming.

Our refractory boys are chiefly gone home & we are quiet & regular again. The seceders are beginning to come back & submit & we have many letters from parents and guardians who entirely disapprove of the course pursued by the students. Whether they get back depends upon the merits of each case which when application is made will be separately considered.

I remain my dear sir as every yours very truly,
B Silliman"

BS to EH, Box 3, folder 39

"Yale. Aug 11, 1828

Dear sir,

I wrote to you last week respecting the proposed jaunt to Wilkesbarre &c, & the next day received yours of Aug. 7, relative to the milk whitewash. Mine has been made with good new milk, instead of skim milk, although I do not see any reason why the latter should not answer provided it be not sour so that the albuminous portion is, to a degree, separated. I have never used it upon wooden buildings nor upon brick. I put some of it upon stone & it adhered very well, but it was only a few weeks ago. I have no doubt it would answer well upon brick, for common water white wash will last for years upon brick & I presume that milk white wash would do better. I suppose however your were first to make an experiment upon some portion of the back side of one of your buildings, that it remain through the next winter & if it should appear well as I doubt not it would then proceed with the application.

Aug. 18.

My unfinished letter has lain because I hoped daily to hear from you & as the period shows nigh when I must decide about the Wilkesbarre jaunt I hope you will let me hear from you soon. I should wish to go by the Lackawanna mines, I suppose by New York & Newburgh or Kingston & then across the country to Wilkesbarre. That would be a centre from which to # & get the other coal regions or taken them on the way to Phila. or perhaps go from that city to the Schuylkill Mines. I am not greatly informed as to best class of operations but expect soon to be.

My impression is that from this place the tour will occupy three weeks at least, perhaps 25 days. I hope you will come; pray write immediately & let me know your views. Besides your company which would be very agreeable to me, I should highly prize your professional assistance & advice. If you come let me know how soon after the 10th of Sept. you could start.

I shall take pleasure in noticing Cordier in the Journal but it must be done soon as I must finish the October No. before I go. I am glad that your young men have translated it; it will no doubt interest many.

If you are willing I will thank you to prepare the analysis which you suggest, but this I would suggest. [sic] Dr. Cooper was lately here & took my copy offering to find me a review & analysis for the Journal, which, should he execute it I must of course insert, but I have doubts whether he will ever do it & if not yours would be very much desired by me, and I think the labor would not be lost as you would have it for your own use. I have not been able to touch my chemical book since last winter. If I ever get it done I can certainly have no objection to its use elsewhere. I should be happy to visit you at commencement but cannot.

Very truly your friend,
B Silliman

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania

"Amherst 16th August 1828

⁴⁴³ The visit to the Wilkes-Barre region was postponed until May 1830.

⁴⁴⁴ Cordier's book was reviewed by Thomas Cooper in the AJS 15, 1 (1829): 109-31, at the end of which Silliman referred to the Amherst students' translation.

Dear Sir,

There will be only two weeks of our vacation remaining after your Commencement. But I can probably make arrangements with some of the gentlemen here to take my recitations for a week or so at the beginning of the next term, though such an arrangement cannot be continued long as my chemical lectures ought to commence with the term since the time of their continuance is limited. Could we accomplish the tour to the mines in three weeks provided I should be in N. Haven to start immediately after commencement? Should you take a public conveyance or a private one? What route should you take to reach Wilkesbarre? If I should go on before you across the country at what time could you meet me there? If you will drop me a line in answer to these enquiries I will give you timely notice of my decision. I think I can go, certainly I shall try hard for it.

Cordier's Essay will be out in ten days. It is all translated, no small job neither.

I suppose a rebellion in so large an Institution as Yale is as necessary now & then to clear away the rubbish & bad air of a College as volcanoes & thunder are to purify the atmosphere. I believe that the theory of John Calvin explains the cause of such rebellions better than Cordier or Scrope⁴⁴⁵ or Daubeny have done in respect to volcanoes. I trust that your atmosphere will be much more clear & pleasant since the eruption

Respectfully yours,
Edward Hitchcock"

BS to EH, Box 3, folder 39

"Yale. Aug 20, 1828

My dear Sir,

I have yours of the 16th & find that I was incorrect in my last. I had confounded the Lackawanna & the Laxawaxen. The latter empties into the Delaware from the West 20 miles above the junction of the Delaware & the open canal which leaves the Hudson at or near Kingston (Esopus). The object is to obtain the coal which is on Lackawanna & this empties into the Susquehannah a few miles above Wilkesbarre. A rail road is to carry the coal from the Lackawanna to Laxawaxen. From this last it passes down to the Delaware, then down the Delaware 20 miles by a # canal (the river not being navigable or not at any rate convenient) & then it takes the canal to the Hudson. It would therefore be very much out of our way to go along the Delaware & Hudson canal which we wished to see it for its own sake.⁴⁴⁶ The best course will be to start from this the day after the commencement (the 21st of Sept.) & we can reach Easton on the Delaware to pass the Sabbath. Then two days I think must bring us to Wilkesbarre taking Mauch Chunk on our way, the great head quarters of the Lehigh Canal. From Wilkesbarre an excursion not exceeding I presume a day's ride will carry us to the Lackawanna coal. We then return to Wilkesbarre, then Mount Carbon The head quarters of the Schuylkill coal is about 18 miles I believe. At any rate a day will carry us there, then we can take Phila. on our way back going down the Schuylkill & seeing its improvements. Or, if your time is too short you can go directly back to Easton & go home.

If you wish to start before me I think you may count upon me at Easton # Sept. 13 or 14 & at Wilkesbarre about the 18th where C.D. Shoemaker Esq. will give information. If you prefer taking a few days earlier you can easily pass to Albany, then down to Kingston -- less than half a day in the boat -- then pursue the route of the Canal across to the Delaware & go on to the Laxawaxen & by the rail road to the Lackawanna & so to Wilkesbarre.

I now think that three weeks from this town will be sufficient.

Let me hear from you soon. In much haste, yours very truly,
BS"

BS to EH, Box 3, folder 39

"NH Aug 27, 1828

My dear sir,

Since writing you last I am induced to believe that it may be impossible for me to start from this, the day after commencement. There are so many people & things still hanging in the mind. I shall hope to get away that week. Perhaps you would like a day or two in NY & let me overtake you there. You should get a pretty liberal

⁴⁴⁵ George Poulette Scrope (1797-1876), *The geology and extinct volcanos of central France* (London 1826). Silliman reprinted part of an anonymous British review of Scrope in the AJS 12, 2 (1827): 106-45, adding many comments of his own. Silliman had already reviewed "Notice and analysis of 'A description of active and extinct volcanos, with remarks on their origin' . . . by Charles Daubeny . . .," AJS 13, 2 (1828): 235-310, and AJS 14, 1 (1828): 70-91.

⁴⁴⁶ The Delaware and Hudson Canal opened in October 1828.

allowance from your faculty for the way, as I really think we may have a fine opportunity among the coal mines & if you could command time I should be more than half disposed to extend the tour to Pittsburgh in order to contrast the bituminous coal with the anthracite formations. I travel in the public conveyances. Let me hear from you, a word or two before you come on.

As ever truly yours,
B Silliman”

BS to EH, Box 3, folder 39

“New Haven Sept 13 1828

Dear sir,

I have received the copy of Cordier’s essay & beg you to return my thanks to the senior class for it. You will observe it is mentioned at the end of Prof. Cooper’s analysis; I had but a little nook of space left & crowded in that short memorandum.

I last evening received your other letter in which you mention that you had received mine announcing my intention of relinquishing the journey. I intended however in case you actually arrived at Albany with the purpose of going to proceed with you but I am glad that you got my letter. It is now my purpose, providence permitting, to go next spring & I give you this early intimation that I shall be happy in your company. Just turn it in your mind if you & I can obtain a dispensation for a little more time, say one week earlier & one later than the vacation -- whether we could not stretch on as far as Pittsburgh, perhaps even Cincinnati & Zanesville & thus see the bituminous as well as anthracite formations. I think that at least Pittsburgh could be reached. These are only hints to the wife [sic].

Yours very truly, B Silliman”

EH to BS, Box 5, folder 14

[Not in Edward’s hand, probably his wife’s.] “Amherst Jan. 8th 1829

Dear Sir,

I thank you for your handsome notice of Cordier’s Essay. In requesting a notice however I had no intention of fishing for a personal compliment. Thanks you also for your introductory lecture. By the pamphlets I send, you will see I am still dabbling in theology, & have even ventured into the polemic field.⁴⁴⁷ I do not expect, however, that you will submit to the labour of wading through these publications, but they may be serviceable to hand over to some of your theological friends.

I wish to know when the remainder of your chemical work will be out. Might not an interesting article for the North American review be made out, upon the history of American Chemistry? Mr. Everett having requested me to prepare an article connected with the science of this country, the thought occurred to me, that if health and time should permit, I might take up the subject as a review of your forthcoming work, that of Dr. Hare, &c.

I should have sent you at this time a description & minute specimen of American Tin, were I not suffering with a severe & protracted attack of Influenza.⁴⁴⁸

By your Journal just received, I notice with pain, the death of Mr. Bowen, but it becomes us who are older and who have already felt our frail tabernacle repeatedly shaken, to heed the warning note for preparation, which Providence gives rather than repine. It is gratifying to learn that he died in faith, and I rejoice that you had the courage to announce the fact in the Journal.

Will you present my respects to Mr. Shepard and request him, if he visits Amherst this winter to call at Gen. Howe’s & ascertain how much of my bill remains unpaid?

Sincerely yours, E. Hitchcock [not EH hand]”

BS to EH, Box 3, folder 40

“New Haven Feby 9 1829

My dear sir,

Yours of the 8th ought to have been answered sooner but I have been in the press [sic] all winter & my time much filled. Besides the Journal which is a standing dish [sic] I have been putting myself on paper as regards the outlines of geology in an appendix to Bakewell⁴⁴⁹ & it will also appear separately. My part is about 127 pages.

⁴⁴⁷ Anon. [Hitchcock], *Pulpit exchanges between the Orthodox and Unitarians* (Boston 1828).

⁴⁴⁸ The short piece, Hitchcock 1829, “Tin,” was sent Silliman two months later: *AJS* 16, 1 (1829): 188-91.

⁴⁴⁹ Bakewell 1829, with Silliman’s substantial appendix.

I think you will find that we are not very wide apart about the dominion of fire & water & I have not entered into any critical discussion about Genesis, choosing rather to trust to the facts to gradually bring the criticism right than to provoke a controversy. As the chemistry will not be ready before next fall perhaps you may find it convenient to substitute a view of the rise & progress of Geology in this country & Bakewell might be your text. I think such an article would be both agreeable & respectful & is needed in this country. I certainly have no objection to the other & perhaps you may do both taking different times for the labor. Suddenly I received from Mr. De La Beche just as my little sketch was about finishing his tabular view of every thing above the old red sandstone including organic remains & thus was able to make two or three important corrections.⁴⁵⁰ This tabular view is very large -- a sheet of 3 1/2 feet by 2, fine print in parallel columns with captions.

I thank you for your sermons which I shall by all means read but have not found time hitherto.

I should be glad to receive your account of the American tin & a little specimen if possible.

By the bye, I will just drop a hint to your private ears because I am not in a condition to talk publicly in the same way. If you write for the Journal I may have it in my power to make you a little compensation.

You observe that we have lost our eminent & useful Dr. Smith. May we be prepared to follow.

As ever yours most truly, B. Silliman

[P.S.] Mrs. S. will attend to your request."

BS to EH, Box 3, folder 40

[Date after signature:] "NHav. Mar 12 1829"

"My dear sir,

I understand that a review of Bakewell & of American Geology was expected from you for the Christian Spectator in its new form but that it is delayed by your ill health of which I am very sorry to hear. I hope you will soon be better & I now write to you to say that Mr. Horne intends forwarding for your acceptance a copy of the American edition of Bakewell & that in the interim you can borrow one of your booksellers to whom several copies have been forwarded. I would send you a copy of my outline separate but do not know now of any opportunity. I will do it when I have one. The Outline is I believe not exactly like any other & perhaps you would like to notice it, altho' I do not ask you to praise it or to give it any other treatment than you would the work of a stranger. Perhaps, however, it will be thought too geological by the theologians & too theological by the geologists. Pray note any errors, omissions, superfluities or indiscretions, observing that the philosophy of geology was I aimed at. [sic]

I trust we shall see your review either in the North American or in the Spectator, & remain in haste, yours as ever being cordially,

B. Silliman."

EH to BS, Box 5, folder 14

"Amherst April 1st 1829.

Dear Sir,

You may suppose that I intended to reply to your request concerning the Review of Bakewell in my letter which contained an account of the Goshen Tin. But I had not then received your last letter. The truth is I had promised the editor of the Spectator to review Scrope on Volcanoes & Cordier's Essay on Temperature, and I was going merely to give an account of the new theories on geology that have recently appeared with their bearing upon religion.⁴⁵¹ Bakewell I had not thought of including nor was it published when I made the promise. But upon consideration I think it will come into my plan very well and also your Lectures which unless you object I shall put down on the Review as a distinct work.

I hope to get this Review ready for the next No. of the Spectator: but at present I am lecturing at the rate of six lectures per week & have seven recitations. The pressure I hope however will be over soon. In haste with much respect &c. E. Hitchcock"

EH to BS, Box 5, folder 14

"New York May 12th 1829

Dear Sir,

⁴⁵⁰ Silliman apparently received from advanced pages for De la Beche 1830.

⁴⁵¹ Hitchcock anonymously wrote a purely secular review of Cordier and Scrope: Hitchcock 1829, "Essai."

I did not see Mr. Featherstonehaugh til last evening when he introduced the subject of the new Journal.⁴⁵² And I write to you principally to say that he has not yet received your letter on the subject. He professed to be very friendly to you & readily acknowledged how much was due to you for your exertions in respect to your Journal & how unwilling he & his associates should be to do any thing to injure your Journal or your feelings. I urged the probable impossibility of two journals succeeding & the importance of having some agreement with you if the work must go on: and I suspect they would be ready here to make you an offer for the work if they thought you would dispose of it to them. But they seem to think that this must be the place from whence it should issue. I have not heard any other of the savans here say any thing on the subject but doubt not that I shall.

We had some powerful speaking today on the subject of the sabbath by Dr. Beecher & others. This afternoon ten or twelve thousand members of the Sabbath school were collected in Castle Garden.⁴⁵³ These scenes cause Christians to thank God & take courage.

Yours &c, E. Hitchcock”

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania

“Amherst August 1st 1829

Dear Sir,

I made some hasty suggestions the other day with a pencil upon the sheets of your Chemical work which you sent me & returned it by mail, that is, the last packet you sent me. The first I have retained. Extra labors the present season have very much prostrated me & my eyes especially have suffered severely. This was the reason that I could not give your sheets a more thorough examination. I trust you will understand my criticisms: that is, their object. I object to every thing to which I can find an objection without having determined in all cases my own mind that the criticism is well founded. But I throw it out & leave you to make as much of it as it is worth. I trust however that I need make no explanations on this subject.

I have strong objections to the arrangement of your book as explained in the Introduction. It is not because I have any particular attachment to the theoretical views adopted by Ure, Davy, Brande⁴⁵⁴ &c but simply because the division of the simple bodies according to their electrical characters and arranging them in a few natural subdivisions according to their physical characters (exigr. gases – non-metallic metals) possess in my opinion an immense advantage over every other method so far as the instruction of tyros is concerned. I adopt this opinion partly perhaps from the effect of learning the subject myself according to both these arrangements. Early in life I studied the subject according to the old method of arrangement & after an interval of many years took it up with the help of the clew I have mentioned & it seemed to me like getting out of chaos into order. I do not mean to characterize your arrangement as old because I am aware you have the countenance of some of the latest and ablest writers. What I object to is the want of that simplicity of arrangement which furnishes so great a help to the student, particularly in recitations.

Notwithstanding this objection however I am satisfied from what I know of you & what I have seen of your book that I shall wish to make it a text book in our College. I thought it best to [be] explicit in regard to my objection in order that I might enquire whether you would not be willing to insert an index of 3 or 4 pages at the end in which the subjects are arranged according to Webster’s Manual referring to the pages in your book where they are treated of? This would greatly assist me in recitations in the class. Indeed it would nearly do away with my objection to your arrangement since I could give out the recitations according to the little Abstract I published a year or two ago.

Will your book be out so that we could use it here next term which commences about the 20th September?

⁴⁵² George Featherstonehaugh (1780-1866), British geologist and surveyor who spent long periods in the United States, published the sole volume (12 issues) of the *Monthly American journal of geology and natural science* (Philadelphia 1831-32).

⁴⁵³ The famous Presbyterian minister Lyman Beecher ((1775-1863), leader of the Second Great Awakening, and father of Harriet Beecher Stowe, Henry Ward Beecher (Amherst class of 1834), and eleven other children. Castle Garden was the site of New York’s port of immigration that preceded Ellis Island.

⁴⁵⁴ Ure 1829; Humphrey Davy (1778-1829), *Elements of agricultural chemistry* (London 1813, et seq.); William T. Brande (1788-1866), *A Manual of chemistry* (New York 1821).

I perceive that you have come out with a strong hand concerning the Journal & I am glad of it.⁴⁵⁵ As soon as the community understand the real ground of the difficulty, I doubt not they will answer your appeal promptly. Whether I shall get you any additional subscribers I do not know but I feel it to be my duty to try.

We have just got out a Catalogue of Plants growing in this vicinity, a copy of which I will send by the first private opportunity.⁴⁵⁶

I mean to propose if you have no objection to have your edition of Bakewell put down on our Catalogue as a text book in Geology.

Respectfully yours &c,

Edward Hitchcock

P.S. Would you like for the Journal a drawing or two in each No. of some plants growing in this region? I have a few of this kind which are very well done & would send them with short notices if you thought it worth a while [sic] to be at the expence [sic] of having them well done. If not well done they would be of no use.”

BS to EH, Box 3, folder 40

“NHav. Aug 5 1829

My dear sir,

Just after closing a letter to you this morning I received your two dollars for which I thank you. I cannot tell who has the Reliquiae but I wrote to Dr. Webster about it: I am however still without an answer. If I can track it, I will write to you.

I can have no objection to your inserting my edition of Bakewell in your list of studies but on the contrary should be gratified by it. I have no objection whatever to binding up the appendix which you propose & will do it [for] you, furnishing it in season.

You will observe however that even [?] upon my plan:

1. Three of the purple gases out of four are together or very near.
2. The simple non metallic combustables are together.
- 3 . The metals are together.

I have objections to the electric arrangement; Dr. Turner has stated them substantially.

I am very much obliged by your frankness; it is just what I want & when you write again if any thing occurs that I can alter for the better do not forget to mention it; for instance whether too full or not full enough, too much condensed or too little, generally clear or not &c. I should like your plants & a notice of them. Will lithography do? If it will you may send them at once in my care to the Messrs Pendleton's Boston. Should they not then be done on sized paper? so that they can be coloured? If Mrs. H (your good emanensis to whom you will present our kindest regards) can do them I should be obliged & she must not be offended if I pay for them as I would elsewhere. I have a pack of newspapers from almost every part of the country containing all of them [crossed-out words] many of them warm notices of the Journal & I think it probable that 100 subscribers may be added; that will help but there ought twice [sic] that number acquired. I cannot find that they are doing any thing in NYork but they will if they think they can make it go.

I thank you for your friendly disposition towards the Journal & its editor & remain as ever truly your friend,

BS

[P.S.] If the lithography will not answer I will have the plates done by engraving by a competent artist, not however Mr. Doolittle. 900 should be struck of if Mrs. H will color them.⁴⁵⁷ They can be sent to you direct without any further orders from me. I am sorry to hear that your health is not firm.

It is not supposed that the Chemistry can be quite done by Sept. 20th, but it is proposed to do it up as far as done, say to the metals for the use of those who want it earlier & to send the remainder afterwards.”

EH to BS, Box 5, folder 14

“Amherst 17th August 1829.

Dear Sir,

⁴⁵⁵ Silliman's "Preface" to AJS 16, 1 (July 1829) stated that new subscriptions put it on a sound footing. Advised to give the journal broader appeal, he wrote that he was resolved to concentrate on American science, albeit not addressed solely to experts.

⁴⁵⁶ Hitchcock 1829, *Catalogue*.

⁴⁵⁷ This project had no issue.

There was no necessity that you should trouble yourself to give me the reasons why you did not adopt in certain cases my suggested corrections. For your last two letters however I thank you.

The two last sheets I did not return because I saw no alterations of importance which appeared to me desirable [sic].

In regard to the proofs I wish to say that I do not receive them till about sun down & then they must be returned by the next morning's mail or they will be too late. But such is the state of my eyes that it is quite out of the question about reading at all in the evening. Hence I do not find time to look at the proofs except to glance at them in the morning. In this way I am satisfied that I cannot make any suggestions that will be of importance enough to pay for the trouble of sending them. The expence also must be considerable. I am willing to do any thing I can to help you, but really in this case I think you had better conclude to follow your own judgment & I doubt not those concerned will be satisfied. I have seen enough of your work to be satisfied that it will be vastly preferable to Dr. Webster's in our College. But since I last wrote you some difficulties have occurred to me in regard to its open introduction the next term. I find that our booksellers here supposing Webster's work would be used have purchased copies enough for the next class & I doubt whether I am not bound to give them an opportunity to sell them. I find too that Dr. Webster (agreeable to my assent) has mentioned on the title page that his work is a text book here. It might be indecorous therefore so soon to substitute another of your works into the class the next term which would prepare the way for its full introduction the subsequent year

In regard to the drawings of plants, I am in no hurry to have them done nor do I really know whether they are of importance enough to justify the expence of engraving & colouring them. Two of them for example are drawings of two plants (species of *Malaxis*) thought by some of our best botanists to be distinct species but considered varieties by others. The object would be just to let botanists abroad have the advantage of accurate drawings in order to judge of this point. A third is a drawing of a species of *Hypericum* not very uncommon in our country but not described by any writer on the plants of this country. A fourth is the only wild species of pink growing in our country. I should like to have you ask the opinion of Dr. Ives & Mr. Shepard about putting them into your Journal. If you think one or two of them would make a good appearance there occasionally they are at your service though I care very little what is done with them.

I have obtained one new subscriber to your Journal (Mr. Snell teacher in our College) & hope ere long I shall get more. Mr. Snell will I think be a permanent subscriber because he has a taste for science.⁴⁵⁸

Respectfully yours &c,

E. Hitchcock

[P. S.] I think I have found the Gehlenite [torn loss] this region but dare not yet announce it."

EH to BS. Benjamin Silliman Papers, Manuscripts & Archives, Yale University Library.

"Amherst Oct. 19th 1829

Dear Sir,

I should have sent you the enclosed account before had I not supposed that Mr. Shepard had prepared a similar account for the Journal.⁴⁵⁹ It seems to me that the publication of some such statement will promote the study of our favorite sciences in this country & therefore I have given it. If you think otherwise however, I shall be content with its non-appearance.

I am going on slowly with my chemical lectures & want very much the first part of your work. I hope Gen. Howe will send a few copies to this place as soon as the first part is out. I think I shall continue to get it on our Catalogue the present year perhaps in connection with Dr. Webster's.⁴⁶⁰

Our Lyceum [Pittsfield] has become a subscriber for your Journal & I hope to get some more. Rev. Mr. Newton of Marlborough VT thinks of trying to get the whole set. I hope you will let him have them at as low a rate as you can: for he is really a discerning man & very fond of natural history. Mr. Shepard will mention his case to you & tell you all about him.

Respectfully yours &c.

E. Hitchcock"

BS to EH, Box 3, folder 40

"New Haven Jan. 10, 1830.

⁴⁵⁸ Ebenezer S. Snell (1801-1876), professor of mathematics.

⁴⁵⁹ Apparently statements supporting Silliman's intention (AJS 16, 1 [July 1829]) to feature American science in his journal.

⁴⁶⁰ Silliman 1830-31; Webster 1826.

Dear Sir,

You will observe that your communication is in the present No. of the Journal; the information is valuable & I have requested Mr. Shepard to pay you for it at the regular rate of \$1. per printed page. Don't say a word against it & against a similar course in future, for my good friends & indulgent country having (in six months from the time that the Featherstonehaugh decree for the destruction of the Journal went forth) given me the 1000 subscriptions asked for & I doubled the subscription. I am now able to pay & I choose to do it. If I was ever of any advantage to you in earlier years that account is long ago cancelled -- especially by your valuable & laborious exertions in former vols. & I now wish you to send me all you are willing & able to publish & something if convenient for the April No. & I will pay for it as above. Mr. Newton shall have the entire copy of the Journal at the lowest price at which entire sets are sold to booksellers, that is at \$1.50 a vol. in nos. or if you say it is a meritorious case he may pay, not naming it however as a precedent — say for instance \$20 for the 27 vols. & less if he pays #. I trust Milborne [?] has supplied you with the chemistry. I am sorry that I am obliged to make it 2 vols. but I cannot find fulfill my design without. If you observe more errors than are corrected by the pen pray send them to me. We entered all the errata that we can discover shall be corrected [sic] by neat clerkship before they go out. They would doubtless have been fewer if we had not lost your quick eye. I wish you would set it again for the 2d vol. in which we are not far advanced. Our kind regards to Mrs. Hitchcock.

Yours ever faithfully,
B Silliman"

EH to BS, Box 5, folder 14
"Amherst January 24th 1830.

Dear Sir,

On opening your letter I could hardly imagine for what you had enclosed a five dollar bill. I knew indeed that you were in the habit of paying for original matter for your Journal but was not aware that the mere translation of an advertisement was entitled to any such reward. As it is however I have nothing to say but to thank you & to assure you that it will always give me pleasure to contribute to the pages of the Journal when it is in my power. But I believe Providence does not intend that I shall do much more in the cause of science. My constitution seems almost literally worn out & any little extra effort absolutely upsets me. The most rigid temperance in eating & drinking is doing something for me, that is, it makes me more comfortable, frees me from melancholy &c but seems not to have the power to restore my exhausted stamina. I am making a little effort this vacation in behalf of temperance with a view of address [sic] the students of our college in the hope that I may save some of them from gluttony & drunkenness. Were it not for this I think I might make out a few fragments for your journal. I have lately executed anew & on a larger scale my geological map of the Connecticut to use in lecturing: and really if the old plate on which it was engraved were not lost I should be almost disposed to ask you to have a new impression of it inserted in the Journal. I could make several corrections & additions of some importance: ex. gr. I am ready to prove that what we have called the Coal Formation is the New Red Sandstone Formation of De la Beche's Tabular View. (This view I venture to retain a little longer with a view completely to satisfy myself on this points, though if Mr. Shepard says you will probably want it immediately, I will forward it.) The alluvial of the old map I should divide into Tertiary, alluvial & diluvial & concerning these I could say some new things.

I shall always be happy to hear of the prosperity of the Am. Journal identified as I conceive it to be with the progress of American Science & particularly glad when I see such evident improvements in the whole execution as the last two Nos. exhibit. I thank you for the notice of the trap rock near Hartford & Prof. Olmsted for his able sketch of Sir H. Davy.

I am much obliged to you for a copy of your Book on Chemistry -- three Nos. of which only I have received. The more I examine it (permit me to say without intending to flatter you), the higher does it rise in my estimation. I only fear that the increase of the price will render it very difficult for many of students to obtain it. But certainly I shall recommend it to them as much superior to any work of the kind in our country.

Have you looked at Prof. Stuart's attack upon the geology [torn loss] his Hebrew Christianity?⁴⁶¹ (Notes upon the first chapter of Genesis). Because I think he has laid bare his back so fairly that it would be an easy matter to apply the lash: and I certainly would try to switch a little if my health would permit. But a man must expect a long controversy if he begins & perhaps it is wisest to leave it alone.

⁴⁶¹ Moses Stuart (1780-1854) was a prominent biblical scholar who taught at Yale and at Andover. His publication referred to has not yet been identified. He was known to believe that the new geology had to be rejected if the infallibility of the Bible was to be preserved.

What has become of Dr. Buckland's 2d volume? I do not see the foreign Journals to know whether it is out.

Respectfully yours &c,
Edward Hitchcock

P.S. I have not looked at your Chemistry with a view to find errors. When the term commences I shall have occasion to go over it more thoroughly. I will note any thing that I see. I dare not promise that I will examine the proofs of the second volume only because of poor health."

BS to EH, Box 3, folder 40

"NHav. Mar. 11, 1830

My dear sir,

A heavy pressure of labor has prevented my replying sooner to yours of Jan. 24. I am sorry to hear such poor account of your health but do not despair. Persevere in care & I trust that by & by life will turn in your favor. I cannot ask any thing of you in your bad state; but what you can do & are inclined to do for the Journal will always be acceptable. Do you suppose that the old map of the Connt. valley could be corrected without a new plate? I will ascertain before this letter goes whether the old plate is in existence & if not I can ascertain what the corrected map would cost lithographed or engraved. If not too much for the Journal I should be much inclined to have it reinserted. You will let me hear again when convenient.

If you send me back De la Beche's view by June 1 it will do; that sent to the Geological Society appears to have been stolen as I can find nothing of it.

I am glad you think the Journal improved. I hope by & by to make it better still if I get safe through with my present labors & some others that I may undertake, providence permitting. (I only glanced at Mr. Stuart's geological remarks: my previous correspondence with him showed me how poor a judge he is of such matters & I must include nearly all our theological gentlemen here who discover no disposition to listen to reason & evidence on this subject.

If one had health & time it might be well to open the subject but I have not & I shall only teach & write as I think without regard to the obstinacy of those who will neither listen nor learn. I should be glad to see you engaged with them if your health will sustain you but I think you had better be on your guard till you are firmer.

I see nothing of Buckland's 2d vol. I am greatly gratified with your favorable opinion of the chemistry. I am sorry it is so large & costs so much (\$5 or \$5.50 I suppose) but I thought on the whole I must exhibit the science as it is & it is scarcely possible to be thorough and bring it within much smaller compass. Where [?] the principle of solution of facts, principles & applications, a small work might be written but whatever I may do hereafter, I thought it would not answer for me (or another oldest lecturer on this subject in our country) to begin with mere beauties. I will forward you vol. 1 complete.

As ever most truly yours,
B Silliman"

BS to EH, Box 3, folder 40

"New Haven April 27, 1830

My dear sir,

I received your notices too late for the Journal which was already closed when they arrived. As I am now writing at college, I cannot advert to your letter which is at home and my more immediate object is now to inform you that (D.V.) I may expect to leave this about May 20th to visit the coal regions of Wilkesbarre & other parts of Penna. I am again invited by a committee of the citizens & as you had once intended to go with me I think it but fair to inform you of the proposed design & I need hardly add that it would add much to the pleasure & enjoyment of my tour to have your company & assistance in making the observations. I expect to start on Monday morning May 10th pray to the bible arriving in NYork then on to Mauch Chunk & Mount Carbon & probably the other regions in the vicinity before going to Wilkesbarre; but these details can be settled afterwards. I think your vacation is on the 12th [?]; probably you can get off a day or two earlier & join me in New York if not here. If I hear that you will go I will write to you again. I am sorry to hear that your health is still languishing & if geological journeying will aid you, I think this might be an interesting tour.

Hoping to hear from you, I remain as ever truly your friend,
B Silliman

Profr. Hitchcock

I break away from two years of uninterrupted labor at a time when I have not a moment to spare -- because my health although not broken is worn down by long # intensity of mind."

BS to EH, Box 3, folder 40

“New Haven May 9, 1830

My dear sir,

To your letter just received I think it proper immediately to reply even on the sabbath. We start tomorrow morning & expect to be in Wilkesbarre at the close of this or beginning of next week where we shall be as a centre perhaps ten days. You can conveniently reach us by monday or tuesday of next week, say one day to Easton on the Delaware & one day to Wilkesbarre.

I now add that I think you & I (to compare great & small) as Conybeare & Phillips did may jointly produce in the course of some years a work both elementary & also a digest of North American Geology which will do good. You undertake certain parts & I others & thus appear jointly with our initials upon [?] respective parts if you choose. It is desirable therefore that we see as much together as may be & I am anxious to look over Penna. with you. Mr. Shepard is ardently studying conchology & if we thought proper might be enlisted, but I must not enlarge & should not have mentioned the subject today but that the reason I have now named may never have presented itself to your mind & may be decisive [?] as to the present tour. The chemistry will I trust be finished in three months.

I trust you will come & at any rate write direct to Wilkesbarre care of C. D. Shoemaker Esqr. that I may know how this thing strikes you.

I shall be anxious to see your book -- pretty good proof that your energy is not gone.

Yours as ever,

BS.

Profr. H.

From Wilkesbarre we can reach easily other coal locality (anthracite) & shall have every assistance from the inhabitants.”

BS to EH, Box 3, folder 40

“New Haven June 21, 1830

My dear sir,

As I am now on geology I need that chart of De la Beche & will thank you to forward it to Mr. Wadsworth or in any other way that you judge best. I hope you are well since your return. I am so & it is happy for me as I find much to do.

I have not received your notice on granite & it is now too late for this no. but I trust you will have it ready for the next.

You will find in the July no. some notice of our late observations & I have prepared a paper on Mauch Chunk for the October no. & hope to get [?] the Schuylkill mines in the fall.

I remain as ever truly your friend,

B Silliman

Mr. Johnson has # today for Greece & all that region as instructor in one of our ships of war.”

BS to EH, Box 3, folder 40

“NHav. Octobr. 5, 1830

My dear sir,

I did not see Mr. Johnson but will answer your question regarding the Journal. I will put it to the Society at half price which is below the lowest terms granted to the trade & I will allow to go at this rate through the current year which will bring 20 vols. to the Society in nos. at \$30 & they may pay in installments of \$10 at convenient intervals. If they wish them bound I will have it done at the lowest wholesale rate. They shall pay no more than it costs.

De la Beche I received in season. I am glad that you like my account of Wilkesbarre. I can have no objection to your # review.

I am glad you are engaged in the Geological Survey of the State & shall be pleased to insert an account of the rocks as you propose & it would be well even without waiting for that to send me a notice of your proposed labor for the next no. of the Journal. I will send you Ure (a poor book) & Beudant.⁴⁶² The latter must go by some

⁴⁶² Ure, *A new system*, and François Sulpice Beudant (1787-1850), presumably his *Voyage minéralogique et géologique en Hongrie* (Paris, 3 vols., 1822).

careful person & I will thank you to ask some proper person to call; the money arrived safely. I meant you should have sent me its worth in granite veins. I allude to what you showed me in the steamboat on the Delaware.

I have an interesting letter from Mr. Bakewell but have no time now to relate what is in it.

With best wishes as ever truly yours,

B Silliman

Professor Hitchcock

PS to Mr. Johnson

Dear Sir,

I would have been happy to see you & hope you will call when again in NHav. Your letter was already answered (as above) when it arrived: it was handed in as I was folding this; you do not say how you will have the books forwarded. I will put them into a box & may very probably convey them to Hartford myself in a few days: if not I will endeavor to find someone who will see that they are not forgotten in the road. You will please write promptly if you prefer any other plan of conveyance.

Yours very truly,

B Silliman"

EH to BS, Box 5, folder 14

"Amherst Nov. 1st 1830

Dear Sir,

The set of the Journal of Science for the students in our College has been received and put into their hands. I will receive the payment of them as you requested & forward it to you by some private opportunity unless you direct to have it sent by mail. The 17th vol. is wanting in the two first Nos. or the two last Nos. are repeated. But I presume this can be corrected by Mr. Howe.

I hope you will get out your Chemistry as soon as you mention. I have received the Nos. as far as they were printed last spring from Gen. Howe by your direction I suppose & am much obliged to you for them. I shall recommend the work to the class on Chemistry in preference to any other although on our Catalogue this year you will find Webster's work recommended along with yours -- a thing which would not have happened had I not been absent when the Catalogue was printed. In consequence of several weeks absence I shall not lecture on Chemistry this term. At the commencement of the next term (about the first of Feb.) I trust your work will be entirely printed, and I hope without destroying your health.

I am glad to see that you have been able to make out so much from the excursion last spring to Pennsylvania. It will gratify the people there & turn the attention of the public that way. I regret only an allusion to my having found the petal of a flower among the petrifications. I did not intend to be understood as expressing my own opinion that the specimen was actually a petal but only that I presumed that this was the thing that had been so called, indeed I saw it thus labelled in Mr. [Jacob] Cist's collection: but I saw the same thing in Philadelphia (Academy of Nat. Science) labelled as a species of fern. You see that Mr. Eaton has caught at the bait in the last No. of the Journal and pronounced me in error, evidently with good relish. However I do not care much about the matter.

Since the last of July I have been engaged nearly all the time in exploring the geology of Massachusetts. My principal object has been to ascertain the boundaries of the different rock formations so that a map of the state can be coloured after the plan of my map of the Connecticut & I have unexpectedly made such progress that a few weeks more of examination would enable me to do this, although to examine particular formations as I could wish to do would demand much more time. But I must cut my coat according to the cloth, that is according to the appropriation made by the Legislature for the survey. Now the map of the State which is directed to be made and which it is intended to colour geologically will not be completed for five years at least. But I should probably be able to finish my survey & make my report next year should my life & health be spared. It has therefore occurred to me whether some arrangement could not be made with you for printing such a Report in your Journal soon after it is made out using a common map of the state of such size as would be convenient. Extra copies of this Report might be printed which could be presented to our Legislature about the same time that it appeared in the Journal. After this I could go on examining the Geology of the State still farther & if any corrections were needed they might be made on the large map which would come out several years afterwards. If the Report were inserted in the Journal it ought to contain many things which would be improper in it as made to the Legislature. How would it do to throw such matter (that which would be interesting only to men of science) into notes? I am calculating to add a second map which exhibits the direction of the strata in all parts of the state, & traverse sections, showing the dip & superposition some [sic]: also several smaller sketches, such as rocking or diluvial hills &c. But these might be done on wood or coarsely lithographed. There could also be numerous drawings of this kind if I should

add my sketches of granite & trap veins as I thought of doing. I mean also to persuade the Governor that it is best to add a list of the plants-animals-fishes-insects-birds &c in the state though I suppose you would not wish to insert these in the Journal.

I have not suggested any thing of the above plan to Gov. Lincoln. But I am inclined to believe the thing would strike him personally especially if he thought that extra copies of the Report could in this way be obtained with less expence than if printed in Boston & possibly you could afford to strike them off for a less sum after the matter had been set up for the Journal. If you think that my plan is at all feasible I hope you will let me know your feelings about it as soon as you can find a convenient time and I will address the Gov. on the subject if it be thought best.

If you happen to think of it I wish you would say to Mr. Shepard that I feel confident I have found the Peliorne [?] at the copper mine in Hubbardston & I think he must have found the same thing there a few weeks before me.

Have you seen Lyell's Geology?⁴⁶³ An attempt to explain Geological phenomena by the operation of causes now in action. I have received it but have not yet had time to examine it.

I am much obliged to you for your notice of my Lectures which I did not expect to see, much less did I expect you would let me escape so easily & commend me so generally. The printers are engaged in a second edition which will be corrected & considerably enlarged and I wish I could see you face to face to obtain from you suggestions as to alterations & improvements.

Respectfully yours,
Edward Hitchcock"

BS to EH, Box 3, folder 40
"New Haven Novr. 19, 1830
Dear Sir,

If you will write precisely what is the deficiency in the 7th vol.* or otherwise, it shall be immediately sent by mail or otherwise as you may direct. I am laboring incessantly & intensely at the Chemy., some days & nights when I am not interrupted, 12 & even 15 hours like the Germans but I am very well, only I am tired: 500 pages of vol. 2 are done & it will in spite of my # very nearly reach 100 more. I shall be glad if you like it but don't concede anything to favor. I should have been very sorry had you omitted Dr. Webster & I hope you will continue him on your list. I wish to supplant no man. If my life & health last you will have my book by Christmas or New Year.

I am sorry I mentioned the fossil flower. I will insert anything you may wish about it in the next no. of the Journal. I shall be pleased to insert your report in the Journal presuming that its length will not render it incompatible with my limits & a due proportion of other articles. Instead of notes I think I should prefer an appendix that the scientific matter may appear unbroken & not merely hooked on. The catalogue of plants & animals (unless of those merely [sic] which are rare or extraordinary) I should not think it best to insert in the Journal. Would not the Gov. give his influence to have a part of the piece of the map sections &c for the Journal paid by the state as it would honor the state through the civilized world ** & Genl. Van rensselaer example might be quoted who gave his name to the Journal. The expense of plates is a very heavy item, something I will certainly do on that head whether the plate will aid another in case they will furnish the engraving. I will furnish the copies they may want & this gratis or with only a charge for the paper.

I suppose the granite veins will be my affair to pay for. Before you finish that article you should visit the great axe manufactory in Canton (Connt.) 17 miles west of Hartford where are the most astonishing granite veins that I have ever seen baffling Neptune & Vulcan both to produce. See them by all means & the manufactory is an object of great interest. Lyell's geology I have, but cannot read it till spring or summer.

I am glad that you are to have a new edition of your book.⁴⁶⁴ I should like to have you render some expressions about gluttony shifting to less gross & physical in the language & there are some slips in the continuation of sentences &c which need closer pruning [?]. I marked some of these things in my copy but have no time or power to enlarge.

I think you too exclusive as to tea & coffee & on natural acidulous mucilaginous saccharine aqueous & slightly alcoholic drinks, such as cider & natural wines especially when they contain carbonic acid.

In haste as ever truly yours,

⁴⁶³ Lyell 1830-33, vol. 1, 1830..

⁴⁶⁴ Hitchcock 1830.

BS

I showed Mrs. your letter.

Perhaps the Govr. might say a word as to the bearing the Journal has had on the cause of knowledge here & on the public reputation. Prest Quincy would I think warmly favor such an impression.

As you go over the Chemistry pray note errors & deficiencies.

*I have just opened a letter of S. Britten & you giving me the information as to the missing nos. which I will forward by mail.

**& giving in & illustrate the report & render it vastly more intelligible.

BS to EH, Box 3, folder 40

“New Haven Jany. 4, 1831

Dear Sir,

I am glad to hear that your report is in so good a train - - - -

Since writing the above it has been handed to me all safe with the beautiful map.⁴⁶⁵ I am sorry you have had the trouble of copying it for my sake. Without waiting to read it (which I hope to do within the coming 24 hours) I write immediately to make two or three business inquiries.

If I understand you correctly the government of Mass. will not pay any thing for setting up the types provided I employ the Messrs. Adams to print the copies for the Journal: I suppose then that I pay for them of course.⁴⁶⁶ I believe my early suggestion to you was that if the government hope to have their copies struck off here from our types (in which case I expected you to receive the proofs by mail & correct them till you were satisfied), they would pay only for paper & printing.

Now my question is, will the government pay for the printing at Amherst provided I should prefer to have the types set up again here from your printed copy, in which case both they & I pay for the printing? In this case would it be any disadvantage to you personally?

Is the map lithographed of full size with the drawing & would it go into the Journal double folded, that is up and down & also right left?

What will the map cost per 100 for paper & printing without paying for the stone?

What will the coloring cost done with you—per 100, counting 1000 or 1200?

Is the loss you speak of incurred from estimating too low the cost of lithographing & printing it off? Would it not be just that I should sustain a part of that loss if the report & map appear in the Journal? If so what part?

You shall hear from me again as soon as possible after I get your answer: I have no doubt we shall agree.

Yours very truly,

B Silliman

Prof. Edwd. Hitchcock

BS to EH, Box 3, folder 40

“You are at liberty to show this letter to Messrs Adams or any other persons whom you wish to consult.

New Haven Jany 23 1831

Dear Sir,

After attentively considering your letter & conversing with some persons I would suggest the following considerations.

1. I cannot believe it possible that the government of your most respectable state would refuse to compensate you for actual & at the same time economic cash disbursements: you have executed your arduous duty with faithfulness & ability & it appears to me that regard to the honor of the state as well as to yourself requires that you should make the real state of facts known to the government & if they not do you justice the discredit would be theirs not yours. You have only to say that you had misapprehended those who gave you the terms etc.
2. As you cannot wait in this case for a movement by the government & as you present an arrangement with the Messrs. Adams will be, in any event, a losing one for them, I presume that they would be willing to be released

⁴⁶⁵ In AJS 22, 1 (1832): 1-70, Silliman published Hitchcock's “The economical geology of the state, with a geological map,” the first part of his state commission, *Report 1833*. It was accompanied with a folding map of the state, 30 inches wide, colored by hand by Sarah Doolittle for Pendleton's Lithography, Boston.

⁴⁶⁶ J. S. & C. Adams, Amherst.

from the obligation & I fully believe that it would be best for both of you & them that the contract you have made should be given up by mutual consent.

3. This being agreed to I think I can almost lift you out of your difficulty.

Your fair ms. gives the best chance of printing the work very correctly here & the distance is so short between us that you may have a mature revision of the sheets & may see them again after your corrections if you chose although I will give every attention to made them correct.

The Messrs. Adams may have the credit of the job if they wish it & we will if desired put on the title — "printed for the —Adams, Amherst" &c without naming NHav. or any thing relating to the office here.

4. Now as to loss & gain: after due consultation with my printer I find the case stands thus: The setting of the types, if done here, I shall pay. The printing off of 600 copies of 64 pages print will cost \$ at the rate of \$1.15 for 8 pages = for the 600 = \$9.20.

The paper for the 600 copies @ 4\$ per ream will cost	20
600 copies of the map—paper & printing @ 8\$ per 100	48
Stone -----	50
Coloring of the maps can be done here by a good	
artist* accustomed to such things for 2.\$ per 100	12
Deduct the money furnished by your gov't.	100

Balance against you ----- \$39.20 [—]

*A young lady who paints & draws & has acted as a teacher of these things in Charleston S^o Car. She lives by such employment. She is the daughter to our engraver Mr. Doolittle.

But, I will diminish this loss still further by throwing in the printing which will leave you only \$29.20 in arrears.*

*And it may be still further diminished by using a cheaper but still good & handsome paper say at \$3 per ream which would diminish your balance to \$24.20.

Thus it is obvious that the Messrs Adams may be excused entirely from their loss & yours diminished by one half.

5. I would do still more but the map even at the cheap rate at which the coloring can be done here must cost me from \$110 to 120\$ which is a greater sum than the journal has ever paid for any such thing & at the rate charged in Boston I could not afford to insert the map & of course the memoir valuable as it is. Add this, also, that if the appearance [torn loss] report in the hands of the members [torn loss] be about contemporaneous with the appearance of the Journal it would not be anticipated; now it must be thrown a little into the shades.

6. I am apprehensive if the Journal memoir were printed at Amherst (however skillfully & faithfully) that as the work in different offices is not apt to look alike, it might not look of a piece even if your part were the better done.

If you close with my propositions we will begin the work as soon as we hear from you.
I may perhaps suggest a few verbal changes in your memoir which you can alter or exchange again.

Yours truly B Silliman

[P.S.]

If you accept your maps (600) together with 1130 more for the Journal should be ordered on by stage in a box from Boston direct. I often receive them in that manner from Boston. The paper must, you are aware, be sized in order to color well.

Will they not abate the pie a little in consequence of striking off nearly three times as many? I would try them on that point.

I ought to remark that it appears to me your memoir will make more than you estimate in pages which might vary the calculation within a little.

Pray enjoin them not to efface the lithographic drawing until we know the extent of this matter & they hear expressly from you that the stone is no longer wanted."

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania.

"Amherst January 30th 1831

Dear Sir,

I have been applied to to prepare a seminar on the connection between geology & theology to be delivered in N.York the latter part of March as one of a series of discourses on the Evidences of Christianity & having learnt from Mr. Shepard that you own a geological work of Mr. [Gideon] Mantell which I believe takes up that subject, I presume to ask the copy of it for a few weeks provided you should know of an opportunity to send it. Is there any

thing worth reading on this subject in Ure's work?⁴⁶⁷ If so could you not add this also? I feel the need of taking safe ground on this subject: since at the best I suppose you & I are considered rather heretical & it is a wonder if I do not get myself into a controversy but it is time that the subject should be agitated among us I think.

Some of your friends have suggested to me a wish that I should undertake to review your Chemistry: which I should most cheerfully do were it not that I had got head & ears into business (besides the above engagement) before receiving the suggestion—& I fear also that being rather a novus homo in chemistry, especially in comparison with yourself, I should not do the subject justice.⁴⁶⁸ I have just written to Dr. Griscom making a similar suggestion to him.

As to the attack upon your work (or rather upon yourself, for the writer is evidently your personal enemy) I have no fears that it will injure your work but will rather seem to bring it into notice sooner. I am not so much alarmed at the attacks of reviewers as I once was (I as well as yourself have had some experience lately of this kind as you will see by the Note to the second edition of my Lectures now in press). If I am right in the main & feel that I understand the subject, I know that my view will ultimately prevail & if my conscience does not arouse me, I am determined neither to be troubled nor frightened by reviewers whose curses like chickens are very apt to go home to roost.

I have been to Boston this winter to consult the Governor & others about my geological survey: & they think there will be little difficulty in permitting me to send my Report to your Journal & in Nos. too for insertion should you think it desirable & expedient. And I think that the state will probably be willing to bear the expences [sic] of the plates. I have yet made no progress in preparing a report nor can I till I have spent a good deal more time in examination. I am by no means anxious to have it appear in your Journal unless it should be such a thing as would suit you. But being desirous to contribute occasionally to your work & thinking I shall perhaps never have any thing better to offer, I thought I would suggest it. Yet there is no need of coming to any decision on the subject at present.

I regret that your health has suffered so much from your severe intellectual efforts. But I expected as much at least & I believe I warned you. However I find it easier to warn others of their danger than to avoid it myself. I have often had such severe premonitions of serious nervous derangement as I understand you lately experienced & at this moment I am pressed with book making & printing beyond measure. I think of concluding my book on dyspepsy [sic] by adding a rule as a sine qua non that the man who means to enjoy health must never write a book.⁴⁶⁹ My prescription for you at present is that you should stop thinking.

Respectfully & sincerely yours,
Edward Hitchcock⁷

BS to EH, Box 3, folder 40

"New Haven Feby. 24, 1831

My dear sir,

I have not found time sooner to inform you that a week since Mr. Howe took a box with him to Hartford containing all the books which you desired. They were put up hastily at a very short notice that Mr. H. was going & would take them to Hartford & I forgot to attend to your directions. This makes me the more anxious to know whether they have arrived as some of them are of rare value & I will thank you to inform me. I have never learned whether the No. or Nos. of the Journal arrived which were sent to correct an error in the college set & when you write I should like to know whether you have heard from Mr. Griscom⁴⁷⁰ & in case of his declining whether you will have any further communication with the Editor on the subject.

We have a very calm but deep religious solicitude among many of our young men & at present there appears to be a cheering prospect that the fruits will be found & considerable. The annual religious solemnity has been observed with great interest & there is a bible society here in the Med. Col. embracing the quarter number of that description of students.

As ever truly your friend,
B Silliman

Prof. Ed. Hitchcock

⁴⁶⁷ Ure 1829. Ure believed he reconciled a literal reading of Genesis with geology (he charged William Buckland with infidelity).

⁴⁶⁸ Silliman 1830-31.

⁴⁶⁹ Hitchcock 1830.

⁴⁷⁰ John Griscom (1774-1852), a chemist at Queen's College (later Rutgers), contributed to the AJS a regular column surveying foreign writings.

I trust you have received the 2d vol. of the Chemistry which went I believe at the same time with the other books.”

BS to EH, Box 3, folder 40

“N.Hav. Mar. 20 1831

Dear Sir,

My sole motive in writing to you lately was to know whether that subject was still in your custody or within your knowledge. I did not correctly understand the facts as you have now explained them. Nothing was further from my thoughts than to worry you with the affair.

Our religious # do not appear to be abating but advancing both in college & in town. I never saw such a time among the students -- but a small proportion remain uninterested in some degree & a very large number have apparently espoused the truth. God grant that it may wear well.

In haste I remain dear sir,

Yours very truly,

B Silliman

Prof. Hitchcock

I shall with seasonable notice if you will have any of your geological report ready for the July no. of the Journal; that for April is drawing to a close.”

BS to EH, Box 3, folder 40

“N.Hav. May 21, 1831

Dear Sir,

I received yours with the 10\$* enclosed & thanks you for the communication.

I write now to enquire whether the paper on Spiders can be ready immediately or within a few days as there is now room & it would be in season if forwarded by June 1. There will be persons coming to college & if not it may come by mail.

The geological reports I trust will come in good time. Should the first half be ready for the October No. I will thank you to give me notice in season & also whether the map will accompany it & be done by the state or whether any thing is expected of me on that part of the subject.

I have exceedingly regretted that controversy as to wine; it can do nothing but harm & is regarded I do not doubt by the enemies of temperance as proof of dissension in the #.

I remain as ever very truly yours,

B Silliman

Prof. Hitchcock

* I will send the Society a receipt when the affair is through.”

EH to BS, fragment published by BS in AJS, 1831, vol. 2, p. 410.

“Extract of a letter from Prof. Hitchcock to the Editor, dated June 9, 1831

Mr. Oakes, of Ipswich, showed me, the other day, an interesting specimen from the White Hills. He labeled it, ‘from the falls of Amonoosuck, one mile and a half, down the river, from E. A. Crawford’s White Mountains—close to the road—a single loose specimen.’ It is a coarse granite, whose felspar is flesh colored and the quartz smoky; both being distinctly crystalized. Mixed with these, are several prismatic terminated crystals, which I have little hesitation in saying are topaz! For they have the hardness of that mineral, and exhibit a lamellar structure at right angles to the axis of the prism—a character, which I have found very decisive of this mineral when crystalized. These crystals are limpid, and resemble very much the topaz from Brazil.”

BS to EH, Box 3, folder 40

“New Haven June 27, 1831

Dear Sir,

As I shall need to refer to Mr. Mantell’s book I must request you to send it by stage as soon as possible as I shall want it within a week. Will you do me the favor also to send it with it—if you can spare it—your copy of De la Beche’s Section of English strata as mine has disappeared since last year (the second that has gone in that way) but as I have ordered two more from England together with the author’s new work on Sections (geological).⁴⁷¹ I shall be able to replace yours if lost. It might come rolled on a stick & the book between two thin boards.

⁴⁷¹ De la Beche 1830. Additional “sections” were published subsequently in fascicules.

I have recently received a box of local specimens from Mr. Mantell but have not had time to open it as yet. I suppose his other work is in the box & I will loan it to you if it is & you desire it soon & Lyell's book also if you have it not.⁴⁷² Lyell's first vol. is very valuable & interesting but he pushes the operation of compression [?] acting as much too far as ancient geologists did those of catastrophes of the first ages.

Our order of precedence here is according to the date of diplomas which almost always coincides with the order of appointments to office—natural age is disregarded. When our president is away I take his place in the government & had once even to sign an expulsion. His recitations we shared among us, generally however, filling the time with our own subjects. Dr. [S. G.] Morton wrote from Phila. that Mr. F - -⁴⁷³ began his new editorship there by swearing [?] at the American Journal—as you may observe in his prospectus—but adds 'this course has already done him extensive injury. He will not obtain three subscribers among the members of the academy. As a popular naturalist his reputation has sunk almost to zero. You have nothing to fear from such opposition.'⁴⁷⁴

I have announced his journal without remark. Your notice of White Mountain topaz is printed.⁴⁷⁵

Yours ever,

B Silliman

Prof. Ed. Hitchcock

Genl. Van Rensselaer has sent a vindication of Mr. Eaton against the No. Am. Rev. & I have added a few remarks.

I wait your time as to your report - -

If the piece on Spiders is to go in I should like it early as may be."

BS to EH, Box 3, folder 40

"N.Hav. July 27, 1831

Dear Sir,

I have yours of June 29. I will send you Mr. Mantell's Geology of Sussex.⁴⁷⁶ I expect to go to Hartford in a few days & will leave it for you at Mr. D. Wadsworth's to be called for or perhaps forward it by stage. You will of course use it carefully as I wish to preserve it unsoiled.

Thank you for remembering the Spider webbs [sic]. I am looking to see them in the air.

I think if you had called first on Mr. John Hull of the Ellington Academy you would have got access to the bones.

I suppose you have seen the new monthly Phila. Jour. [Featherstonhaugh's]. Dr. Morton writes me that the Fossil Rhinoceros *Allegheniensis* is only a *lusus*, being a piece of sandstone & the so called teeth are two quartz pebbles adherent.⁴⁷⁷

I will find you an extra copy of No. 2 vol. XX of the Journal for your acceptance.

Be so good as to jog the elbows of the young gentlemen of college as the balance of their payment for the Journal would be acceptable. I believe it is 20\$, but perhaps I named a longer credit. I have forgotten how that was; they will probably remember.

In haste yours as ever,

truly

B Silliman

Profr. Hitchcock

Mr. Mantell has sent me a very interesting collection of the Sussex fossils including some bones of the gigantic saurians—some of them in the rock—the iron sand or rather sandstone [?]."

⁴⁷² Lyell 1830-1833.

⁴⁷³ George Featherstonhaugh.

⁴⁷⁴ Samuel George Morton (1799-1851), published *Synopsis of the organic remains of the cretaceous group in the United States* (Philadelphia 1834), and *Crania americana; or, a comparative view of the skulls of various aboriginal nations of North and South America* (Philadelphia 1839). From 1832 onward he was a frequent contributor to Silliman's journal.

⁴⁷⁵ Hitchcock, "Topaz in the White Mountains of New Hampshire, extract of a letter from Prof. Hitchcock to the editor, dated June 9, 1831," *AJS* 20, 2 (1831): 410.

⁴⁷⁶ Mantell 1827.

⁴⁷⁷ Featherstonhaugh, "Rhinoceros *alleghaniensis*," *Monthly American journal*, 1, 1 (July 1831): 10-12. The frontispiece lithograph represents the purported rhinoceros jaw. Featherstonhaugh proudly announced his identification of this "fossil." He sent a cast to William Buckland in Oxford, asking him to present it in his name to the Geological Society.

BS to EH, Box 3, folder 40

“N.Hav. Sepr 27, 1831

Dear Sir, I was too busy to write when Mr. Shepard went & I am looking over unfinished concerns I find that I have not written to Prof. Snell equally to the intimation contained in your letter of Aug. 22.⁴⁷⁸

I will thank you to hand him the enclosed note.

I will let the other Society have the Journal upon the same terms—payments semiannual—in two sums. Was it \$1.50 per Vol.? I believe I have no memorandum of the affair whatever. Whatever it was it shall be the same.

Yours very truly,
B Silliman

Prof. Hitchcock”

BS to EH, Box 3, folder 40

“N.Hav. Octob^r 10, 1831

My dear sir,

I have yours of the 3d [?]. The books you can keep probably till you have done with them, certainly till June 1.

I am surprised & gratified by what you tell me of the gold. Has it anything to do with that found at Newfane a few years ago? When Mr. Wilder is ready I should be glad to publish the fact in the Journal either in your report or otherwise. I should however doubt whether such a discovery would be beneficial to Vermont.

I thank you for your statement about the [geological] report. I believe I perfectly understand you & I trust that you & I & Massachusetts can arrange the thing.

For the January No. I have ready a long & I think important & interesting memoir of the late Mr. Whitney—inventor of the Cotton Gin—by Prof. Olmsted, with a portrait.⁴⁷⁹ This will occupy I suppose 80 pages, perhaps more. I have not yet seen the MS. I think however that I might make room for your first part and at the same time if you find it desirable for your own convenience to postpone it till the April No. it might be done without inconvenience to the Journal.

As soon as you know any thing certain from the State Government you will please apprise me.

As the granite veins, rocking stones &c, I think I may shoulder them unless they are very numerous. I trust we can easily arrange that part of the business. As to the views of topographical scenery &c, I should be fond enough of them provided the Journal can afford it. If you will allow me to see them I will obtain information as to the cost & make up my mind seasonably. I should be gratified to have your report appear in the Journal. I think the whole appropriate except perhaps mere catalogues of names & they are not so truly inappropriate as to most readers uninteresting. Perhaps as you suggest there may be a selection.

As to correcting proofs there will be no other difficulty than some little delay as you can & might see them safe into the world. I thank you for your friendly disposition towards the Journal which has heretofore been much benefitted by your labors, but if going into its pages will embarrass you seriously or you would—all things considered—decidedly prefer another mode of publication, I leave you entirely at liberty notwithstanding what has passed.

Hoping to hear from you as soon as you have any thing to communicate, I remain my dear sir, yours as ever,

most truly,
B Silliman

Prof^r Ed^d Hitchcock

The marriage of my eldest daughter last week makes me feel that I am no longer young & the feelings of Mrs. Silliman who was taken suddenly with a fever the day before the wedding makes me feel that an important domestic change may not be salutary. Mrs. S. after being very ill for a week is now coming out of her fever but very much reduced. Our # # # who loves them & he will # them # sooner or later. Our regards to Mrs. H.”

EH to BS. Benjamin Silliman Papers, Manuscripts & Archives, Yale University Library.

⁴⁷⁸ Ebenezer Strong Snell (1801-1876), professor of mathematics and natural philosophy at Amherst College.

⁴⁷⁹ Denison Olmsted, “Memoir of the life of Eli Whitney, Esq. inventor of the cotton gin,” *AJS* 21, 2 (1832): 201-54, and Silliman, “Reminiscences of the late Mr. Whitney.” 255-64. Olmsted was by then professor of mathematics and physics at Yale, author of *An introduction to natural philosophy; designed as a text book, for the use of the students in Yale College*” (New Haven, 2 vols., 1832).

“Amherst January 7th 1832

Dear Sir,

A simple statement of facts will furnish an answer I believe to most of your enquiries in your letter of the 4th instant this moment arrived.

On several accounts I felt desirous of having my Map & Report published in season to be distributed to the members of our Legislature during the present session. The Governor & Council had only \$100 placed at their disposal for this purpose & perceiving that they were not likely to come to any decision on the subject in season, I told Messrs. Adams that if they would agree to furnish the Government with 600 copies of the Map & Report (the number they wanted) for \$100, I would run half the risque of losing. From some conversation with Pendleton I inferred too hastily that the lithographing & printing & coloring 600 maps could not cost over \$60 and then the paper & press work could cost about \$50 more: and should there be any demand for the Report in the community or should you conclude to have it inserted into your Journal & get the printing done here, we might get paid for setting the types. The Governor & Council closed with our offer and I soon found that I had sadly missed in my calculations as to the cost of the Map. The cost of lithographing will be \$50 and \$48 for the paper & printing of 600 copies. Then if I get the coloring done in Boston I must pay \$12 per hundred or \$72 for 600, making a dead loss to us of \$70.* You can now see how it would reduce our loss were you to employ the Messrs. Adams to print for you. But as to your enquiry whether you ought not to bear some of the loss, I answer promptly No: nor would I have you feel under the least obligation to have the printing done here unless you can do it without any sacrifice. I recollect your suggestion about printing for the Government: but I saw plainly that unless some definite proposal was made to the Government, nothing would be done this winter & the thing must be delayed a year: and besides, I thought it could be quite desirable to have the thing done under my eye. I regret the course I have taken but I perceive now that it is too late [to] retrace my steps.

You will see by the above statement that the cost of the Maps per hundred (without paying for the stone), on bank bill paper enclosed, is eight dollars.

And of coloring in Boston twelve dollars per hundred. I apprehend this is rather high: and probably you could get it done lower in N. Haven or Hartford. I shall probably be compelled to pay this sum as I have no time to look about much & I want it executed well as I trust it could be in Boston.

I have not ascertained how the map will fold into an octavo but presume there will be no difficulty as the paper will be very pliable.

In the Map in Mr. Pendleton's hands, all the boundaries of towns & most of the smaller rivers are left out so as to avoid compression, & the localities of serpentine, steatite, metals &c are designated by bright colored circles & dots.

I must send this by the mail which closes in a short time & believing I have answered your enquiries, I subscribe myself respectfully yours,

E Hitchcock

*I ought also to include the setting of the types, about \$50, making the whole loss \$120.”

EH to BS, Box 4, folder 1 [This letter is with a note BS added to it on April 12, 1834, which see. BS then re-addressed it to Hitchcock, using its outer flaps for his own message.]

“Amherst January 19th 1832

Dear Sir,

I told the Governor that the printing of my Report should be executed in the style of your Journal and therefore I should prefer that your printer would employ the same kind of paper for it which he employs for your Journal. If this be not convenient I should prefer the best kind of paper which you sent me to the other.

I intended in my last letter to state definitely that the Messrs. Adams would print here a title page & table of contents for prefixing to the copies of the Report which should be printed at N. Haven: so that your printer will have nothing to do except to leave out the captions you may insert in the Journal & just put in capitals at the top of the first page the word Report. He need not leave any pages blank. The Messrs. Adams will also prepare covers for the pamphlets & we shall expect to have them done up here. I understand you to state only the terms for printing the Report & not to include the folding, sticking & covering.

I wish your printer to include in his bill the striking off of the 1100 copies he prints for us. If in the end I find myself deeply involved it will be time enough to ask my friends to help me out.

I fear Pendleton will delay the execution of the Map too long although I have urged him very earnestly to get it out immediately. I have not yet received a proof impression from him and am anxiously waiting for one.

I add on the next page a few remarks which if you think worth inserting in your Journal as an extract from a letter they are at your service.

Truly yours,
E. Hitchcock

Extract of a letter from Prof. E. Hitchcock of Amherst College, Massachusetts. [Here BS wrote: "See my own remarks in the Journ. in 1821. vol. 3, p. 179"⁴⁸⁰]

Within a few years past I have repeatedly noticed a fact in regard to the thermometer which I have never seen stated: and yet, if I am not mistaken on the point, I can hardly conceive that it should not have been observed. In very cold, clear & still weather in the winter, the thermometer often sinks, from 1°, 2°, or 3° (Fahrenheit scale) between daylight & sunrise. The cold seems to increase, indeed, till within a few minutes of the time when the sun appears above the horizon. The circumstance is observed to most advantage, when the thermometer is at least as low as zero. Within a few days past, it sunk one day, half a degree, when the mercury, a little before daylight, stood at 17°. The next morning it stood at 18°, & sunk something more than a degree; and the next morning, it sunk from 21° to 20°. If the wind blows perceptibly, on clouds overspread the sky of considerable [torn loss]. I have never noticed the fact although the cold may be equally great. The morning [torn loss] the last observation mentioned above was made, the [torn loss] considerably overcast; & it was somewhat foggy; although vapour was mostly congealed, I have never before noticed the fact when the thermometer stood as high as 21°. Nor have I myself ever seen it sunk more than 2°. But during the present winter, which has been peculiarly favorable for making the observations, Professor Snell of this college informs me he has sometimes seen a difference of 3° between 5 o'clock & sunrise.

I ought also to mention that those mornings are the most favorable for noticing this occurrence, when the weather for several days has been growing colder & colder, with strong westerly winds, and a clear still night succeed, & the weather rapidly and permanently moderates as soon as the sun is well above the horizon. Hence it cannot be imparted to the general increase of cold in the atmosphere.

I have a theory for this phenomenon, which I will suggest though I have but little confidence in its correctness. During the calm, very cold nights which precede this occurrence, most of the vapour in the atmosphere must be congealed; and perhaps a considerable portion of it rises to the upper regions of the atmosphere, in consequence of its greater levity by freezing. When the sun's rays strike their delicate spiculae & laminae of frost, they are melted, and heat is absorbed. The absorption may be so great, as to abstract a portion of the heat remaining in the lower regions of the air, which the direct rays of the sun have not yet reached, just as a freezing mixture absorbs the heat of surrounding substances & sinks the thermometer.

The introduction of this subject reminds me of an idea, which has often passed through my mind during this early & long continued cold of the present winter, & which, it seems to me, ought to be taken into the account in explaining the great difference in the cold of different winters in the same place. Suppose that early in the season, say the first of December in this latitude, a powerful storm occurs, when the thermometer happens to be just below the freezing point. It will, of course, be a snow storm: and the earth's surface will be enveloped in a mantle, which is an almost perfect non-conductor of heat. Consequently, none of the heat, which would radiate from the earth, can pass through it to warm the atmosphere. The air, therefore, continues still below the freezing point, and the next storm will be snow. Thus the coat is thickened; & the heat in the earth more securely imprisoned. In this way the air may for weeks or months be prevented from getting above a freezing temperature; so that every storm shall be of snow; & every successive coat of this non-conductor will tend to increase the cold, which cannot be broken up till the wind shall blow for a considerable time from a warm region. But suppose the storm is of rain on the first of December; even though the temperature was only 3° or 4° above what was necessary to have converted it to snow. The heat will not thereby be prevented from radiating into the atmosphere from the ground; & this will tend to keep the temperature so high, that the next storm will not improbably be of rain; & so on, perhaps for weeks or months.

So much if I mistake not may sometimes depend upon the occurrence or non-occurrence of an early snow storm, in giving the character of severity or mildness to our winters: although doubtless other & more powerful causes often intervene and modify or counteract the foregoing tendencies."

EH to BS. Benjamin Silliman Papers, Manuscripts & Archives, Yale University Library.

"Amherst January 31st 1832

Dear Sir,

⁴⁸⁰ AJS 3, 1 (Jan. 1821): 179. In a footnote, Silliman registered an even deeper drop in post-dawn temperatures than those cited by Hitchcock. To recall this, Silliman must have had at hand an index of his own writings!

As the first part of this sheet [there] is a statement in relation to an economical mode of keeping bees through the winter by placing them in the ground with a small quantity of honey. It was made out by M. Ebenezer Burgess of Grafton VT now assistant preceptor of the Academy in this place.⁴⁸¹ I have not paid attention enough to the habits of the bees to be able to form a definite opinion concerning the facts he has mentioned. But thinking it possible that something valuable might grow out of them, I send the statement to you to decide what you please.

If you should extract any thing worthy of insertion in the Journal I should have no objection to having you insert it with it something like the preceding paragraph with my name to it. I wish that Dr. J. V. S. Smith of Boston could see the statement & he could probably tell whether it was of any service as he has attended particularly to the habits of bees & published a book on the subject.

By the stage on Friday next I calculate to send you a coloured map to serve as a model for Miss Doolittle. It is a proof map from Mr. Pendleton coloured by the lady in Boston who would be willing to undertake the whole job, & corrected by Mrs. Hitchcock in a few places. You will see that all the patches of different rocks have figures placed upon them corresponding to those on the tablets which will I think greatly aid the colouring as well as the person who examines it, especially in the evening. The colours are Prussian Blue, Green, Gamboge Yellow, Carmine Red, Vermillion Red, Umber & Neutral Tint. The latter colour is not so common on maps in this country but is much used in Europe. I think it preferable to purple but if Miss Doolittle cannot obtain it I suppose she must use purple. I have directed Mr. Pendleton to send to N. Haven by stage 855 copies (795 on thin paper & 68 on drawing paper) as soon as possible & to proceed with striking off 1130 more as fast as he can & forward them in the like manner. I hope Miss. D. will put all the good brushes in N. Haven into requisition & complete the 855 copies as soon as possible after receiving them. Then I should be glad to have them sent to J. S. & C. Adams, Booksellers, Amherst. If the Reports be printed before the maps are ready (I apprehend it will be before they reach N. Haven), I wish Gen. Howe would send 1100 copies of the Report to Messrs. Adams by stage that we may have them folded. I perceive that the Report will make over 70 pages so that I must have made some mistake. Indeed the whole trouble seems to have been on my part a budgetary #.

I think you will say that Mr. Pendleton has made a very neat map. If the colouring correspond, I think it may compare especially well with European maps though I do not expect to have it equal that recent splendid map of Nova Scotia by Messrs. Jackson & Alger which I presume you have seen.⁴⁸² I fear that Pendleton will not find as good paper as would be desirable though I have taken a good deal of pains to see that there should be no failure in this respect.

The proofs of the Report come regularly & I send them back immediately, finding that they reach N. Haven in due time. I hope you see them after I do.

I shall be glad to see a map which Miss Doolittle has coloured on thin paper. But she need not stop colouring for me to examine it. Any errors I shall notice will immediately be forwarded.

Do you own the late work of Dr. Macculloch on the principles of geology mentioned in the memoir of Messrs. Jackson & Alger?⁴⁸³ I see he is a fluvialist. What are we all coming to? Is not the sense [?] of the whole that he is an infidel: and yet the Rev. Mr. Sedgwick is a fluvialist. As yet I must believe that no theory but the diluvial will apply to this continent. I have a good many facts on the subject to communicate in the scientific part of my Report if Providence gives me health & strength to prepare it.

Respectfully yours &c
E Hitchcock”

EH to BS, Box 5, folder 16
“Amherst, Feby 21st, 1832

Dear Sir,

The printed copies of the Report (1100 I suppose) were safely received by the stage a day or two since. We are much gratified with the execution & the paper.

⁴⁸¹ Burgess was one of several tutors at Amherst College who boarded at the Hitchcock's house: Tyler 1873, p. 167.

⁴⁸² The Jackson-Alger map was an improved successor to the hand-colored geological map of a portion of Nova Scotia that Silliman had published as the frontispiece to the AJS 14, 2 (July 1828), to illustrate those authors' "A description of the mineralogy and geology of a part of Nova Scotia," pp. 305-30.

⁴⁸³ Macculloch, *A system of geology, with a theory of the earth, and an explanation of its connexion with the sacred records* (London 1831).

Mr. Pendleton informed me on the 10th instant that the next day he should dispatch 800 copies of the map to N. Haven. I had hoped to receive by this time a copy colored by Miss Doolittle. Cannot one be sent by mail doubled like a letter?

I will thank you not to insert at present the little article I sent you on meteorology. I have since that time been keeping a register to the phenomenon there described which confirms the position there taken essentially. But I have found a remark of Mr. Kirwan's⁴⁸⁴ which perhaps involves a statement of this same kind: and I wish to examine further. Should it ever be inserted in the Journal I will forward the registrar also.

I was exceedingly interested in the Memoir of Mr. Whitney in the last No. of the Journal. I knew but very little about him I find.

I am told that Featherstonhaugh has made another attack upon you in his journal.⁴⁸⁵ But I have not seen it as I do not take the measure [?] of one thing, however I am certain that he could not take a surer method to promote your interests.

Respectfully yours,
Edward Hitchcock"

BS to EH, Box 4, folder 1
"New Haven Feby. 24, 1832

Dear Sir,

I have yours of the 21st & one of a previous date which came with the colored map: I have mislaid it but believe I can remember all that was material in its contents.

I am glad that the printed sheets have arrived & that they are acceptable to you. Mr. Pendleton's 800 maps arrived punctually & I should have acknowledged them to him but that I expect more & meant to do both at once.

I do not wonder that you begin to be impatient for a sample of Miss Doolittle's coloring.⁴⁸⁶ You must excuse her: the sickness & death of her father & her own illness consequent on fatigue & grief (for father & daughter, his only child, were knit together) have caused delay. For some time past however she is diligently at work with two female assistants. By tomorrow's stage I shall forward by stage a map for your inspection. You will make allowance for the great difference between the fine stout drawing paper of the example & the thin & imperfectly sized paper on which she is working: the colors do penetrate & spread in a degree although not I trust to the material injury of the map. I have pointed out such corrections as occurred to me on a cursory survey. Doubtless you will see other things & write as to every thing that is remediable. I do not however believe that the work can be done for the New Haven price with the elegance of the Boston work & indeed when I see how laboriously these young women work here, I doubt whether 3\$ per 100 will be a just compensation.

(I am glad you were pleased with Mr. Whitney's life; much more might have been said but enough is said to know that Mr. Whitney & the Cherokees received very similar treatment & that the Georgia people are the same that they were 30 or 35 years ago.⁴⁸⁷ As to Mr. Fh I suppose I have seen what you alluded to, a foreign criticism written I presume by Fh himself. I and my works are a standing topic of sneer or attack with him, but he has the game all to himself as I do not reply nor do I feel any serious interest in any thing he can say about me.)

I remain my dear sir yours very truly as ever,

B Silliman

Prof. Hitchcock"

Mrs. Hare writes me that her husband's life is safe although after dreadful suffering. You have seen I suppose that 2 oz. of ful. silver in a vial exploded in his right hand & tore it almost to pieces—tore off the flesh from the bones & broke every finger bone except the little one. Never put ful. silver in a vial. I have for years kept them only in open paper in small quantities & I never lay them in the palm of my hand. You know I paid dearly for my wisdom.

⁴⁸⁴ In the 1790s, Richard Kirwan (1733-1812) published several analyses of minerals and mineral waters.

⁴⁸⁵ In the issue of his *Monthly American Journal* dated Jan. 7, 1832, Featherstonhaugh (purportedly a London "correspondent") roundly attacked Silliman's appendix to Bakewell 1829, listing many errors and particularly objecting to Silliman's recourse to religion.

⁴⁸⁶ Sarah Doolittle, daughter of the New Haven engraver and printmaker Amos Doolittle (born 1754) who had died on February 2.

⁴⁸⁷ Georgia farmers had fought the implanting of Whitney's cotton gin (patented in 1794), and also steadily campaigned to take over Cherokee lands. The state's Indian Removal Act of 1830, pursued vigorously from 1832 onward, led to the mass expulsion westward of the Cherokees in 1838-1839.

I will delay your meteorological paper until I hear from you again. I have often observed the frost which you mention as you may see in the Journal for Jan^y 1821; the thermometer was then usually at its minimum after sunrising sometimes an hour or two & even once as late as 10 # a.m.”

EH to BS, Box 5, folder 16

“Amherst March 4th 1832

Dear Sir,

The map did not reach me until several days after your letter of the 24th ult. but it came safely at last. Its execution is upon the whole respectable and I have not noticed very many errors These are chiefly in respect to some of the smaller patches & I cannot but hope that longer practice will enable the ladies to avoid errors of this kind. I feel satisfied that Miss Doolittle cannot execute these maps for the stipulated price: & I beg you to make her such additional remuneration as you think just & reasonable & make the draft on me accordingly.

I feel so anxious to get my report into the hands of the Legislature before the close of the present session that I have to request you as soon as 400 copies of the map are completed to forward them to Messrs. J. S. & C. Adams, Amherst. The Legislature have been threatening to adjourn immediately: but if they do not I think we cannot calculate upon them continuing in session more than a fortnight. And if I do not put at least a part of the 500 copies of my Report before they adjourn, there is not the least prospect that they will appropriate a cent to the further prosecutions of this business & my bills presented months ago must remain unpaid another year at least. Indeed it would have been far better to have delayed the map another year if it cannot be put into their hands during the present session. I hope therefore you will forward as many copies as are completed by the close of the next week—unless you should see a notice in the papers that the Legislature has adjourned.

Mr. Pendleton is anxious to see the stone from which this map was taken for other purposes. But I have urged him to delay at least till he hears from me again. The fact is I am preparing for the scientific part of my Report, a view of the direction of the strata throughout the state & my plan was to use this same map for the purpose. It would need only that a few lines representing the edges of the strata should be drawn upon the stone & then (without any coloring) it would answer this purpose & the direction of the strata in each particular formation would be exhibited. The only expence would be that of the paper & striking off. What would be your views on this point provided you should insert the scientific part of the Report in your Journal? Probably we could find among some of the booksellers a smaller plate engraved with a map of this state but then such an one could not show the thing so well as this. As to the subsequent parts of the Report I would remark that the second exhibiting an account of our scenery will probably be finished in many months unless it should be thought best to take a few sketches of particular spots. I think this part will occupy between 20 & 30 pages: & if you want it I doubt not it might be ready for your next July No. And so probably as to the remainder you might probably have it if my life & health are spared, as fast as want.

I have just read Featherstonhaugh's pseudo-European criticism upon your Geology. I think the hand of Joab cannot be mistaken. How contemptible such an attempt at deception if our suspicions are true!

Respectfully yours &c

Edward Hitchcock

P.S. Though I have been blown up once with fulminating silver I still keep it in phials though in small quantity & uncorked. But I think I must follow your advice.”⁴⁸⁸

BS to EH, Box 4, folder 1

“New Haven March 8, 1832

Dear Sir,

I have communicated to Miss Doolittle your remarks under date of the 4th; she had already corrected the color as you wish & will pay particular attention to your suggestion on other points.

We hope to dispatch for you a box containing 400 finished copies by the stage of Saturday the 10th so that I trust you will get it by the 12 or 13th & I trust this will be in season.

As none are yet executed for the journal, the young women will then work for that object provided you think the 400 will answer for the legislature. I suppose that that No. must give every town one, which by a little civility among the members will probably accommodate them; if however more are indispensable, please to write immediately. As to the sections, I would enquire whether a section, merely, with the names of the places over it, would not answer every purpose, references for more particular information being had to the map already

⁴⁸⁸ Silliman published an account of the harmful explosion of fulminating silver in his laboratory: AJS 22, 1 (July 1832): 86-87.

published. I suppose the mere section would cost but little as the paper may be narrow & I am disposed to think that it would be better to engrave that as I believe it would be cheaper. I suppose I could have it done very well here, or you can enquire of Mr. Pendleton as to the relative cost of the two methods. Would it not be a waste to have so large a map merely for the sake of hanging a section to it? But before deciding I will wait for further information. I suppose Pendleton can engrave as well as lithographize [sic] and he can therefore, probably, give you an estimate.

I should wish by all means to go on with your successive parts & the only question as to the pictures to accompany the scenery is whether the Journal can sustain the expence. Perhaps you may write the descriptions so that they may be intelligible without the pictures. Should we be obliged to omit them (leaving the description of the pictures distinct by themselves, so that they can be inserted or not as may be decided after we know the expence.)

Mr. Fh's new no. has, I am told, appeared, & for a wonder, without his usual topic. He will probably feel it to be no very flattering indication that five* of their first scientific men have made communications for the April No. of the Am. Journ. & Dr. Morton writes me that the Academy of Sciences have voted unanimously without any overture from me to communicate their doings in future through the Am. Journ. He writes also that Penna. Geological Society is just announced there, in which not one geologist of acknowledged attainment is named & only one hopeful learner Peter A. Brown.

Dr. Hare is so well that he has dictated to me an interesting letter & signed it with his left hand.** He hopes soon to be well again but does not know how far his right thumb will serve again.

I remain as every truly your,

B.S.

Prof. H.

* owing to accidents only three of them will appear in the next no.

** as I did an important document in Novr. 1830 when my right arm had been lacerated among the tendons by an explosion of glass."

BS to EH, Box 4, folder 1

"N Hav. Mar 12, 1832 Monday

Dear Sir,

I write lest you should be anxious for the box. It has taken longer than was expected to finish the 400: they are now promised for tomorrow evening & I hope will go by Wednesday or at farthest by Friday.

Miss Doolittle wishes to know whether those circular colors around letters or Nos. are quite essential as she says they take a great deal of time. I have told her that I suppose they are essential but that I would consult you.

Yours truly,

BS

Prof. H."

EH to BS. Benjamin Silliman Papers, Manuscripts & Archives, Yale University Library.

"Amherst March 13th 1832

Dear Sir,

I feel greatly disappointed in not receiving the map by the stage this afternoon. For last week the Governor wrote me in a good deal of trouble lest the Report should not come to hand before the adjournment of the legislature. For in his message at the beginning of the session he gave what he considers a promise that it should be ready & in his letter he stated that the adjournment would take place in a few days. I wrote him that as I had requested you to send me whatever number of maps might be ready by the close of last [week], I felt confident that if the session continued to the close of the present week I should be able to forward a part of the number required by the Government. But your letter received this evening has nearly destroyed all hope of getting the object in view accomplished. Yet as I do not know certainly but the session may continue a few days longer, I beg of you to send as soon as possible whatever number of maps are ready. If I could get only 50 to Boston in season I should feel greatly relieved.

I do not know that the colours around the letters & numbers on the map are as important as any others. If omitted it would be leaving out one or more finds of rocks or minerals & the omission of other colours would be no #. At any rate I wish them put upon the copies coloured for me and it seems to me that it could sadly injure the map if left off from any copies.

I see no way but Miss Doolittle must proceed to colour for the Journal: though I am very anxious to obtain one or two hundred besides the 400 you mention in order to offer them for sale very soon after the

government receive them, and in that way to make up my loss in part. And you know that such a thing will not excite much interest except when it first comes out. If however the Legislature adjourn before I receive the maps, perhaps the Government will allow me to offer some of them for sale as they will not want them till a year hence. So that I would have you furnish the Journal before me. But when there is such a pressure is it not possible for Miss Doolittle to multiply her assistants? I suppose N. Haven would furnish enough.

I think you must have misunderstood my remarks about a map respecting the direction of the strata. It was the direction of the strata and not their dip which I spoke of. This of course can be shown only upon a map. I regard it of so much importance that I think I shall exhibit it on a map to accompany my Report whether it should be thought best to publish the map or not. It appears to me that the direction of our state strata is important to be known in reasoning upon the original formation & subsequent disturbance of the rocks. Besides this map I have executed four sections (not coloured & very simple), three of them extending across the state from east to west & the other from north to south. Their principal object is to show the dip.

I do not feel satisfied that the map above spoken of is important enough to justify the expense of inserting it in your Journal. But it is not necessary to decide the question immediately as I have persuaded Mr. Pendleton to let the stone remain for a time. Neither do I suppose you will think it best to get any view of scenery inserted in the Journal though we have some which if executed I think would be quite tempting. But they are not executed & probably never will be by myself.

In great haste I remain respectfully yours &c,
Edward Hitchcock”

BS to EH, Box 4, folder 1

“Dear Sir,

I did not answer yours of the 13th # because the maps had already gone when your letter arrived & I trust you found no difficulty in having them in Boston before the legislature rose. I took measures to know that the box went from Hartford & did not linger there. As I wish however to know that you got them. I will thank you to inform me by mail & whether you got the legislature to act agreeably to your wishes.

The Journal will be detained four days in waiting for the coloring of the maps. About 500 are done & we want double that No., so if you did not distribute all your 400 to the legislature, you may as well begin your sales as I will not object on account of the Journal. No omission is made in coloring but the circles & are put on as the last were done. You will let me know in due time your final wishes as to the map to show the direction of the strata. If the present map is used cannot the direction of the strata be shown by some arrangements of lines &c without coloring by hand which is so slow & expensive? But you will let me know in good season what you wish on the subject. I like to have long & elaborate pieces go to press as early as may be.

In haste, yours very truly,

B Silliman

Rev. Ed. Hitchcock

N Hav. April 4, 1832”

BS to EH, Box 4, folder 1

“New Haven April 14, 1832

My dear sir,

The coloring of the maps for the Journal will be done by the 24 or 25th when they will proceed immediately with yours & can finish at the rate of 200 a week & more if they can secure an additional hand or two as they hope. They will go on unless they hear from you to the contrary & if you wish any or all of the maps returned to you to be finished elsewhere, you will in that case also write.

I doubt not I shall approve of your second part & the sooner it is forwarded the better as there will be time for the proofs. I write in extreme haste to get this letter into the mail tonight. We have been occupied with a five day meeting which is just finishing. Pray consult Mr. Pendleton again as to the map. As it is not [to] be colored an unsized paper will do & perhaps in the further closing up of the affair, he will put the maps down to 5\$ a hundred as he has had a pretty good job already out of that stone. Please let me know & whether that map will come in the July No. or if any other drawings will be needed for that No.

In great haste, yours very truly

BS

I rejoice that you just saved your distance with the legislature.”

EH to BS, Box 5, folder 16

“Amherst May 4th 1832

Dear Sir,

I happen to have a good opportunity to present a statement to the Government of the expences of publishing my Geological Report: and I have received all the bills except that for coloring the Map. Will it be too much trouble for you to send me the amount of Miss Doolittle's bill so that I can receive it by next Tuesday's mail? As to the price of coloring I have only to say as I have said that I must leave that for you to fix upon. I have only to say let no injustice be done to an orphan child & that child too a female.

I forwarded a few days since by mail a check on the N. S. Branch Bank in Hartford to the account of Gen. Howe's bill for printing the report, viz \$77.32.

Mr. Pendleton thinks it could be difficult to make the requisite alterations on the map for representing the direction of the strata: but says he will execute 2000 copies of a smaller map (19 1/2 inches long) on a new stone for \$110. I think it would not be best to be at this expence (though this would be not much over \$5 per hundred). But his suggestion has put me upon a track by which I am confident I can get the thing done for half that sum if it should be thought best to have it done at all.

There is no chance I think of having any more of the report ready for the July No. of the Journal. The second part is indeed nearly written but it must be rewritten & submitted to the government, and I am pressed beyond measure with college duties so that I have long been obliged to neglect the report almost entirely. And during the coming vacation I must be away making further researches among the rocks. I am going (D.V.) to Martha's Vineyard & look up some fossil bones & other things of interest.

Gen. Howe hinted that an effort would be made to persuade your Legislature to order a geological survey of Connecticut. I hope it may succeed. The labour cannot be great: for in most cases it would be only necessary to prolong the formations of this state across yours. The expence would be small. Thus far it has been small in Massachusetts, only \$1000 having been appropriated. This work ought to be done throughout N. England, then the other states would not linger long behind.

As soon as Miss Doolittle finishes the 400 copies of the map I wish they might be forwarded to Amherst. I find that the government are waiting impatiently for the remainder & until they are supplied our hands are perfectly tied.

Respectfully yours,
E. Hitchcock”

BS to EH, Box 4, folder 1

“NHav. May 7, 1832

Dear Sir,

Yours of the 4th is this morning received & Miss Doolittle has just been in. Her assistants have departed her & she has been very unwell ever since her father's death & her health is reduced by her close application to this painting job. The copies for the Journal are but just done & the utmost that can be promised is that 200 additional copies for you will be done at the close of next week & the remainder by June 1. Miss D. will go on till she hears from you to the contrary. I shall leave this on Thursday the 10th for NYork, Albany &c. I may be gone a fortnight; any letter in the interim must therefore be directed to Miss Sarah Doolittle at the late Mr. Amos Doolittle's College street. If you wish the 200 before the others are done please write her so & I will give direction as to forwarding them.

I trust you will have the next report of your geology ready for the October No. & in my hands as early as possible that it may have time for correction, & be sure not to fail. The affair of the map I leave to you to arrange. Your last suggestion is quite admissible & I do not say that the first is inadmissible. I am entirely satisfied that the very tedious & expensive work of painting geological maps may, by a little commonsense contrivance, be dispensed with. It costs nearly as much as the maps & would cost more if fully paid.

I have paid Miss Doolittle for my part \$5 per hundred which hardly covered her actual expenses. I presented her with \$5.50 besides.

She names \$5 to you as the price for those she does for you. Owing to broken & bad paper (if not deficient nos.), your maps will fall short about 30. Miss D. says that the paper was not so good as that put for the Journal.

I am just beginning to read De la Beche.⁴⁸⁹

Yours as ever,
B Silliman

Prof. Hitchcock

⁴⁸⁹ Presumably De la Beche's *Geological manual* (London 1831).

About half of the edition of 1500 of the [Elements of] Chemistry is gone off notwithstanding any reviewers.”

BS to EH, Box 4, folder 1

“New Haven June 5, 1832

Dear Sir,

I write now to enquire whether you have among your imperfections any more copies of the 2d signature from pa 9 to pa 16 inclusive.⁴⁹⁰ As the last No. of the Journal has fallen short, I want to make up a few more Nos. from our remnants. If you have those pages to spare I should be glad if you would send me by mail 8 or 10 copies of them & if not 6 or 8 copies of all the sheets & the map of the memoir & let me know the price & I will remit the money. I wrote to you two or three days since respecting Mr. Mantell’s works; it is however possible that I have them at college as I have not looked there for them nor for Phillips’ Geology of Yorkshire.⁴⁹¹ I have read De la Beche & find much valuable matter; he is sometimes obtuse. I am reading Brongniart’s Ecorce du Globe with his map of sections & his nomenclature; the latter is a burden, but the work—the Tableaux des terrains qui composent l’Ecorce du Globe, is admirable like all his writings.⁴⁹²

In haste yours,

BSilliman

Prof. Hitchcock”

EH to BS, Box 5, folder 16

“Amherst June 8th 1832

Dear Sir,

I intended this year to anticipate you by sending back the borrowed books before you should have the trouble to send for them. But having been absent on a geological tour [to Nantucket and Martha’s Vineyard] all the vacation & having brought back with me some interesting fossils, I was tempted to delay sending Mantell a few days in order to compare them with his plates, there being a great resemblance, but in the mean time your letter came. This morning I send by the stage the two works of Mantell,⁴⁹³ Woodward’s British Fossils,⁴⁹⁴ Penn’s Comparative Estimate & his Geology.⁴⁹⁵ I have ventured to retain Beudant’s Hungary⁴⁹⁶ & Sedgwick’s Anniversary Address,⁴⁹⁷ the first for the sake of comparing our greywackes with those of Hungary & the latter for the sake of his description of Beaumont’s generalizations. Supposing from your letter that you would not stand in particular need of these works at present though after all I am aware how trying to your patience it must be not to have all your geological library at hand when lecturing & did I not believe that you have an unusual # of that # I should not dare to trespass upon it so much as I have done. If it were in my power I should pay the freight of the box to N. Haven but I suppose I cannot do it farther than Hartford.

Excuse me for making a few enquiries in this place which you will oblige me by answering at your leisure.

Have you the No. of the Philosophical Magazine & Annals of Philosophy for October 1831, containing an account of Beaumont’s generalizations?⁴⁹⁸ Or do you own the original work of that author? Have you the work so

⁴⁹⁰ Proofs of a portion of Hitchcock 1833: 1-70).

⁴⁹¹ John Phillips (1800-1874), *Illustrations of the geology of Yorkshire*, part 1 (London 1829; 2nd ed London 1835); part 2 (London 1836). In the AJS 21, 1 (Jan. 1832), pp. 1-26, Silliman printed a lengthy extract from Phillips’s part 1. He introduced it with praise as an excellent bringing up-to-date of current views of geology, but “current” meant a pre-Lyell account that maintained the role of the biblical deluge.

⁴⁹² Brongniart 1829.

⁴⁹³ One is Mantell 1827, the other not identified.

⁴⁹⁴ Samuel Woodward (1790-1838), *Synoptic table of British organic remains* (Norwich 1830).

⁴⁹⁵ Granville Penn (1761-1844), *A Christian’s survey of all the primary events and periods of the world* (Alexandria VA, 1814), and Penn 1822.

⁴⁹⁶ François Sulpice Beudant (1787-1850), *Voyage minéralogique et géologique, en Hongrie, pendant l’année 1818* (Paris 1822).

⁴⁹⁷ Sedgwick, “Address to the Geological Society, delivered on the evening of the anniversary, Feb. 18, 1831,” *Proceedings of the Geological Society* 1, 20 (1832): 281-316.

⁴⁹⁸ “Elie de Beaumont’s researches on some of the revolutions which have taken place on the surface of the globe presenting various examples of the coincidences between the elevation of the beds to certain systems of mountains . . .,” *Philosophical magazine and annals of philosophy* 10, 58 (Oct. 1831): 241-64, and “Recherches sur quelqu’une des révolutions de la surface du globe . . .,” *Annales des sciences naturelles* 18 (1829): 5-25 and ff.; 19 (1830): 5-99 and ff.

often referred to by De la Beche entitled Sections & Views Illustrative of Geological Phenomena? Have you the recent translation of Cuvier's great work on fossils? Have you the Geological Transactions up to the present time?

I have received lately a very complicated Electro-magnetic apparatus from Paris intended to show all the experiments of Ampère on this subject: but no description accompanies it nor can I find any in my books. Have you the instrument or any description of it? I can do nothing with it until I can find a description: yet I want to use it this summer. It is No. 346 of Pixii's catalogue of 1820.⁴⁹⁹

Have you a specimen of the Lycopodites Sillimani mentioned by De la Beche (p. 404) as coming from Hadley Connecticut (should it not be S. Hadley Mass?) If you have will you allow my wife to take a drawing of it? Or perhaps Brongniart has figured it. Do you own the work of Ad [olphe] Brongniart on fossil vegetables? Have you specimens of the ,

CONTINUATION OF LETTER LACKS, WAS NOT FOUND IN FOLDER 16.

BS to EH, Box 4, folder 1

"New Haven June 14, 1832

Dear Sir,

I thank you for sending the sheets which I desired & you will let me know what I shall pay for them & for the maps & I will pay it to Miss Doolittle for you.

I send you Brongniart & Brochant's report on Beudant's Memoir which will I suppose give you a good notion of it.⁵⁰⁰ I have never seen the original memoir & do not find it on looking through general journals for the purpose. Should I find it I will send it to you.

De la Beche's Sections & views I have not, nor the more recent vols. of the Geological Transactions nor Cuvier's work on fossils.

I know nothing of the apparatus you mention. I cannot tell what were the specimens to which it seems they have given my name. They were doubtless among those which I have sent at various times to Mr. Brongniart but it would not be certain that I would recognize them were I to see similar ones.

I have one or two tracts of Ad. Brongniart on fossil vegetables but I have not the great work which is publishing in a series of nos. but I must have it & will apply de Mr. De B# in NYork for it.

I have never been able to get a line from the Wilkesbarre folks nor a single pound of coal nor a specimen. I sent them gratis nearly 200 copies of the account of the valley & they had 1000 copies more as I am told printed for distribution, but they never acknowledged the favor altho' I am told they speak of the visit in terms of no limited commendation. I think I will write to Shoemaker for the specimens. I have written to Butler till I am tired. I will say at once that you can procure the map & copies at the rate you mention for the Journal, say 1150 copies. My geological books you can have again at any time after July 8. Have you Philips' Yorkshire 4to: keep it if you have. You will specify what books you want & I will send them if I have them.

If you have not studied [Alexandre] Brongniart's Tableau & map you should by all means do it before writing your 2d part. I had almost said it is worth more than all other geological synopses put together, lucid - exact - candid - philosophical & almost free of hypothesis, but the nomenclature (which however you will understand without much difficulty) is onerous to the memory & much of it as I judge unnecessary, for he is obliged constantly to translate it into the nomenclature before known.

I will send you the work if you wish it. You will see that he sustains my view of the origin of all the primitive rocks except the granite which is found distant from gneiss-mica slate & which he considers to be of igneous origin, while he allows that the granite among gneiss &c is neptunian. He has almost removed my difficulty with respect to the igneous origin of the m# granite.

I trust you do not consider all the red sand of the Connecticut River Valley to be the new. I think you are right with respect to a part but I trust you would not consider that around this town which is nothing but an accumulation of the minerals of granite to be the red.

Miss Doolittle will in a few days forward all the balance of your maps & I will pay for those I have—about ten. I think you should lay your loss before the legislature.

Yours truly,

BS

I shall be anxious to learn more particulars of your discoveries in Martha's Vineyard &c."

⁴⁹⁹ Hippolyte Pixii (1808-1835), a Parisian instrument maker, invented in 1832 an alternating current electrical generator.

⁵⁰⁰ Adolphe Théodore Brongniart (1801-1876) and André J. F. M. Brochant de Villiers (1772-1840).

EH to BS, Box 5, folder 16

“Amherst July 16th 1832

Dear Sir,

As I do not recollect Miss Doolittle’s Christian name I take the liberty to enclose to your care \$46 requesting you to hand it to her. I should have done it earlier could I have ascertained the number of copies she has coloured. And even now I am rather apprehensive that there may be some mistake: for you wrote me that there would be a deficiency of 30 copies whereas according to the statements of our printer & binder there is a deficiency of only six. According to them we have received 784 copies which with the 10 you retained will make 794. These at six cents per copy amount to \$47.64. The printer says that the map costs us about one shilling per copy: so that if you will pay Miss D. \$1.64 for the ten you retained it will make even change. The extra printed sheets sent you are worth nothing.

I am much obliged to you for your letter in reply to my enquiries. The work of Brongniart I have not seen & should be much obliged to you for the loan of it if you have an opportunity to send it. Phillips’ *Geology of Yorkshire* I returned with some other works a year ago. I have now in my possession Sedgwick’s *Address & Brongniart’s Report on Beaumont’s Essay & besides Beudant’s Hungary, Phillips & Conybeare’s England & Wales & Buckland’s Reliquiae Diluvianae* belonging to the Geological Society which I should be glad to keep until I finish my Report if you can spare them.

I have recently Macculloch’s *Principles of Geology*, 2 vols 8vo, which I got the loan of from the Boston Atheneum. Although it is full of egotism & intolerance towards those who differ from him and he denies that there is any evidence of the deluge in the rocks yet this seems to me by far the ablest work on theoretical geology that I have ever met with. He certainly holds a high rank as an observer, a mathematician, a chemist & a reasoner. He is decidedly in favour of the igneous origins of the unstratified rocks but not more so than myself.

I am satisfied from a multitude of observations that the “granite among gneiss” &c has the same origin as the granite that is found distinct: and if you admit the igneous origin of the latter I have no fears that we shall long differ in opinion though I trust that so long as we do differ, we shall not exhibit such a spirit as is shown by some in Philadelphia. By the way since Rafinesque has opened his battery against Featherstonhaugh I am almost disposed to subscribe for both their works in order “to see the sport.”⁵⁰¹

I call all the sandstone along Connecticut river the New Red Sandstone: Because I have evidence that all the upper beds are of this description & have no evidence that the lower beds are not that rock: though I presume that a part of the formation may be the old red sandstone. But I have given up the idea of identifying the formations of this country with those in Europe. I think the safer way at present is to describe our formations as they are.

What if I send you my Report after it is written with a request to examine it? Would you be willing if you think it worthy of publication to express to our Governor the opinion that it would be best for the state to publish it? There will be a good many drawings which the state might execute as well as not but which would be too costly for an individual. I think your opinion would weigh much with the Government.

Sincerely your friend

Edward Hitchcock”

BS to EH, Box 4, folder 1

“NHav. Aug. [early August 1832, but no date or year]

My dear sir

At last I send you a receipt. Miss D. being out of town & myself for a fortnight past excessively occupied with our college canvass in this town for funds. We lay this town at \$20,000 towards the \$100,000, about \$5,000 having been given before by (chiefly) officers of the college. We have got \$10,000 during the late week here & I hope to add the remaining \$10,000 toward completing the \$100,000 & this I think we shall obtain. I trust you will be successful having observed that you are \$30,000 good out of your \$50,000.

Brongniart’s work will be sent to you by young Bates of Northampton in about a fortnight.⁵⁰² I will examine your report as you request & do every thing in my power with your Gov^t & in any other way to advance it. I would be very glad to publish it or to procure it to be published & hope the Journal will be the medium as

⁵⁰¹ C. S. Rafinesque (1783-1840), “Remarks on the Monthly journal of geology and natural science of G. W. Featherstonhaugh for May 1832 (but only published in July),” *Atlantic journal and friend of knowledge*, vol. 1 (Philadelphia 1832): 110-11. It was a scathing rebuke of Featherstonhaugh and his “silent partner Dr. Harlan.” The pair had attacked Rafinesque, and also Silliman because, Rafinesque writes, he had “refused to puff Mr. F.”

⁵⁰² Presumably Brongniart 1829.

before. I go for Angelica where my daughter is married on the Genesee River & shall (DV) leave home Aug. 16 to 18 & be absent probably until Sept^r 25.

I have no time to write of our geological views being still in the traces of hard work on the solicitation.

In haste yours very truly as ever,

B Silliman

Prof. Edw. Hitchcock”

BS to EH, Box 4, folder 1

“New Haven January 19, 1833

My dear sir,

Not being quite certain that the young gentlemen addressed in the annexed letter are still with you, I send these enclosures to you. If they are with you, be so good as to deliver the letters & if not, put the letters to # Zane into the Post Office after sealing it.

It is long since I have heard from or of you. I presume that like us you have all had occupation enough with finishing your fund which I am happy to see is accomplished.

I trust you will now e'er long resume your geological report which you [torn loss] observe by the abstract contained in the [torn loss] Journ. for this month is gaining you credit in Europe.

I am recently from Washington. Mr. Fh. was said to be there waiting to induce Congress to place a geological research under his direction.

Dr. Morton told me in Phila. that the monthly [Featherstonhaugh's] was dead past revival & its editor quite as much out of pecuniary as of scientific & literary credit. I certainly do not rejoice in this but sometimes retribution follows in this world close upon unworthy conduct.

I remain dear sir as ever truly yours,

B Silliman

Prof. Edw. Hitchcock”

Letter of January 19, 1833, to “Messrs. P. & H. le Zane” in envelope sent in care of EH.

“Gentlemen,

I refer you to the enclosed for the reasons why I have so long delayed to thank you for the communications which you left for me in this town last summer: they were however a long time in reaching me as the inkeeper [sic] forgot to deliver them. I send the enclosed letter open to you because I thought you might like to occupy the blank space which it contains. There is no hurry as to sending it & you can let it lie until you have occasion to write.

I hope that the effect of the painful accident is long since removed & that you are enjoying an agreeable & restful course of instruction at Amherst

Whenever you visit this town again I trust you will call on me & let me have the pleasure of forming your acquaintance.

Truly yours,

B Silliman”

BS to EH, Box 4, folder 1

“New Haven June 6, 1833

Dear Sir,

I have yours of the 14th & am glad to hear that you are so near to the completion of your opus magnum. I had no idea of the extent to which your labors have proceeded & I congratulate you upon the prospect of their speedy termination.

I should like to have a peep at some of your lithographs, if convenient, before it is too late to have extra copies struck off if desirable. You will of course be the best judge of the copies that will at once fall in best with the design of the Journal & in giving a favorable impression of what you have done. It is too late for the July no. but there is ample time for that of Octob^r. Let me hear from you on the subject as soon as convenient.

I now stand in daily need of Brongniart Classification of Rocks & of his illustrative chart, which I must urge you to have it packed presently & sent to me by the stage, direct care of John Babcock, Stage Proprietor, New Haven. The others I do not remember that I need. I think however that should no other opportunity presents when you have done with them, they would come safely by stage.

I shall be gratified to see your volume when it is out & as it will be the greatest geological attempt in this country, it ought to be noticed in the Journal by some person able to do it well & inclined to do it candidly. I suppose it may be proper to mention your forthcoming work among the items of scientific news in the Journal.

I have just returned from Washington where I have been to carry a report on the culture of the sugar cane & the manufacture & refining sugar prepared under the direction of the Secretary of the Treasury in compliance with a resolution of the house of representatives.⁵⁰³ The subject was committed to my care & with the aid of Mr. C. U. Shepard & others, I have finished it. I hope by & by to send you a copy. Such labors however are too severe & engrossing (this is eminently true of yours) for men already full of occupation. I am happy however in retaining good health & am sorry to learn that yours has suffered in any degree, I hope not permanently.

With my best wishes, I remain, dear sir, yours very truly,

B Silliman

Prof. Edward Hitchcock”

BS to EH, Box 4, folder 1

“New Haven July 18, 1833

Dear Sir,

I received the books in season. I hope that the short notice of your forthcoming report which I inserted in the late No. of the Journal will not do you any harm & I should be glad if it might be of any service. By the stage of today I have forwarded for your acceptance a duplicate copy of two memoirs of Mr. Witham of Edin. & Yorkshire on fossil trees.⁵⁰⁴ I hope it may not be too late for you to consider the important bearing which the Craig Seith fossil tree may have upon your views of the geological age of the red sandstone of the Connecticut River Valley.

If Mr. Witham is right, a tree with firm ligneous fibre & a tree too of great size has been found in sand & gravel below the coal & belonging to the mountain limestone series. Of course this sandstone cannot be the new red & must correspond to the old; therefore there may be even gigantic fossil vegetable stones in a sandstone below coal.

I think you are probably right in calling the sandstone of many parts—perhaps of most parts of the Connecticut Valley—new red, but I cannot persuade myself that the red sandstone here at New Haven is the new⁵⁰⁵ & it now seems that the discovery of wood in it here a few years ago which staggered me with respect to its geological antiquity is not inconsistent with that fact. I trust you will give Mr. Witham’s memoirs particular consideration before you finally dismiss your work.

My impression is that both the old & the new red stone exist in the great formation of # Count, [?]; that the old has the lowest & is palpably (at least here) granite veins; that the new lies higher in the series & that the coal formation may come between them as elsewhere.

Have you not therefore rather too hastily given up the coal formation of the Count [?] the Val^y? Give me the earliest information you can as to your lithographic drawings. It is probable I shall wish to insert some of them in the Journal & I wish you to inform me what parts of your report you would like to have reprinted in the Journal.

I am sorry to hear of your sufferings & those of your assistants from chemical labors. If you are still in the lab^y where I saw you under your new chapel (I believe it was), you might give it up; my old lab^y was a very badly ventilated room—damp & unhealthy—my new one just the opposite & I know not that any one has suffered in it. They should give you a room ventilated through the roof as well as on the sides & it need not cost much.

Your of the 5th ought to have been answered before but I have been much pressed until recently & am now just running through my letters. I wish, with all my heart, I could come. I owe you good will enough & tobacco all well enough to undertake the job, but I have been two or three years under a partial engagement, as soon as practicable, to address the American Institute in Boston. Their anniversary is on Thursday the 22, the day after our commencement & I believe a few days more are all owed for different discourses. I suppose I could not, consistently, accept an appointment with you, for the very time when I am conditionally engaged (the condition

⁵⁰³ Silliman 1833. See Fisher *Silliman*, vol. 1: 374-77. In Washington in May, 1833, Silliman was received by President Andrew Jackson.

⁵⁰⁴ Henry T. Witham (1779-1844), *Observations on fossil vegetables* (Edinburgh 1831) and his *Description of a fossil tree in the quarry at Craighleith* (Edinburgh 1833). Witham brought his work up to date in his *Internal structure of fossil vegetables* (Edinburgh 1833). Hitchcock cited Witham’s work at Craig Seith in Hitchcock 1833, but unlike Silliman, he correctly viewed it as locating fossil trees in the new red sandstone

⁵⁰⁵ But it was the new red: Hitchcock was right. Two strata of the new red are separated by a layer of basalt.

being probability) to address them & it appears to be impossible to do both. Therefore I do not see that I can do either or, if either, theirs must I think have the precedence.

I rejoice to see the steps taken by the Massachusetts Association⁵⁰⁶ & hope that the eyes of all ministers, of all Christians & of all lovers of mankind may be open to the worship of tobacco, the first & most powerfully [sic] ally of intemperance.

I remain as ever, yours very truly,

B Silliman

Bakewell's 4th edition is just now in hand. I have not examined it much but I like the appearance. It is I believe brought up to the present time.⁵⁰⁷

In the Edin. Philos. Trans. Vol. 11 & 12, which the society have send me, the Craig Seith quarry is developed in two beautiful pictures which impress one very powerfully. A man is astride of the recumbent tree & appears small compared with it, & in the other drawing the magnitude of the rocks and the depth of the quarry make the tree look small & the people in the quarry still smaller."

EH to BS, Box 5, folder 16

"Amherst Dec. 30th 1833

Dear Sir,

If you have not lost a paper which I sent you for the Journal of Science a year ago relating to the state of the thermometer early in the morning in winter, you will confer a favour by returning it so that I may add to it the much more extensive observations which I have since made & if it be judged worthy, send it back to you again. I kept no copy. I should be glad of it by the first opportunity or if no private one comes soon, please to put it into the mail.

During the summer & autumn I sent you in two or three parcels several hundred pages of my Geological Report. I now forward the sheets necessary to make out a complete copy, thinking it may be of some service to you. I trust that Pendleton has sent you as I requested him to do a copy of all the lithographic drawings. It is not in my power to send these at this time.

I thought I had returned to you all the books & pamphlets which I had borrowed: but I find another pamphlet which I enclose hoping you will excuse the error.

I have found time just to dip into your new edition of Bakewell & am gratified with the many obvious improvements which it contains. I am glad you have so boldly thrown the gauntlet as to the Mosaic history. I shall now hope to get somewhat shelter behind your arguments & authority when attacked for certain heresies which I have disclosed in my Report. However, I do not believe that you will have any formal attack made upon you. I know of no theologian opposed to your views who has knowledge enough of geology to dare to do it: and if any one undertakes to qualify himself for the attack I have no fear but he will be converted to our side of the question. The most you have to apprehend I presume is a few squibs in the theological lecture room of Prof. _____ & Dr. _____. [sic]

You refer in your essay attached to Bakewell to several geological works which I should be much gratified to get a sight of and were it not that I have already made such heavy drafts upon your kindness in this way, I should request you to loan them to me for a short time. I refer to Mantell's Geology of the South East of England, Prof. Conybeare's Discourse on Geology etc. Oxford 1832 & Higgins's [sic] Mosaic & Mineral Geologies.⁵⁰⁸

For the last four months my health has been so poor that I have made scarcely no intellectual effort & my sufferings have been severe. How it will turn with me I know not but I desire to wait patiently for the manifestation of the Divine Will.

The bearer of this [letter] is William H. Platt of Oswego N.Y. who leaves the junior class in this college to join that at Yale. He is a very amiable, modest young man of good talents & has quite a taste for natural history. He has lived in my family nearly three years. I hope he may turn out well.

The copy of my Report which I sent you the other day by Mr. Adams you may if you please consider as presented by the Government of the State: and Gov. Lincoln requests me to thank you for the interest you have manifested in the business & the assistance you have given in various ways towards its completion.

⁵⁰⁶ Probably the American Temperance Society, a national organization based in Boston; evangelical in nature, it was closely allied with churches.

⁵⁰⁷ In Bakewell 1833, Silliman brought his appendix up-to-date by referring (often without citing his sources) to geological concepts in the most recent publications on geology and nascent paleontology, and he extended his reasons for reconciling geology with Genesis.

⁵⁰⁸ William Mullinger Higgins, *The mosaic and mineral geologies* (London 1833).

I remain yours as ever
Edward Hitchcock”

[In Silliman’s hand:]

“ + Mantell
+ Bakewell
+ Lyell For Sec. to Geol Soc & Profrs. King [?] vol.
+ Murchison Pres. Geol. Soc
+ Sedgwick Prof.
Dr. John Macculloch [partly crossed out]
+ Murchison’s Discourse before the Geol. Soc.”

EH to BS, Box 5, folder 16
“Amherst January 10th 1834

Dear Sir,

For your flattering notice of my Report in your letter just received as well as in the Journal of Science at various times be pleased to accept of my warmest thanks. I have no claims upon you for a review of the work though were I to choose surely I would not hope for such a happy # of justice & mercy. But I have made no effort to secure any reviews from friends or enemies. The thing I determined to leave to itself.

I am sorry I did not know of the opportunity you mention to send to Europe. I recently forwarded by way of Boston copies of my Report to Dr. Buckland, Mr. Conybeare, Mr. De la Beche & the London Geological Society. I also put up a copy for Al. Brongniart & one for the Geological Society of Paris: but these were returned & are now in my hands. But I know of no chance immediately to send them to N. Haven. I will however forward them as soon as possible. And now will you not take the trouble if this packet does not reach you before you send to request Gen. Howe to let you have two copies & charge them to me & I will supply this place in a few days & send them in my name to Mr. Brongniart & the Geological Society of Paris. The letters I understand must go by mail on account of the custom house.

I have little doubt that if you # to take the trouble to drop line to Governor Lincoln (at Boston) thanking him for the copy which I sent you, paying him a word of compliment for the part he has taken in this business & suggesting to him that it would be well for him to send in his own name a few copies of the Report to the distinguished geologists of Europe, I have little doubt but he would if possible do it. I think you would be much more likely to succeed than myself because I have made so many applications to him of a similar kind of late for gentlemen in this country. I would gladly send copies myself: but my stack is nearly exhausted. In case he should comply you might probably get the copies of Mr. Howe & have them forwarded from Boston as soon as possible to him.

I would suggest should you write to Gov. Lincoln that you should add to the names you mentioned in your letter Elie de Beaumont, the editor of the Bulletin of Sciences of the Revue Scientifique & in England of Dr. Macculloch & the Editor of the Westminster Review & that of the Philosophical Magazine.⁵⁰⁹ Those to whom I have sent might of course be omitted.

I make these suggestions in great haste & you can comply with them or not as your judgment shall dictate. If you write to Gov. Lincoln I would advise you to do it immediately as I suppose his gubernatorial powers will cease in a very few days.

Respectfully yours
Edward Hitchcock

P.S. I presume in the preceding remarks you have received a letter from me by Mr. Plat [?] stating that the copy of my report which I sent you is to be regarded as the gift of the Government.

I did not hear that my name had been mentioned by Mr. [Roderick] Murchison You will oblige me greatly by sending me his address.

EH to BS, Box 5, folder 16
“Amherst March 27th 1834

Dear Sir,

I received in safety the copy of Mantell’s Geology & I have read it with great interest. I shall send it by the bearer if he can take it: if not by the earliest opportunity. From the fact that the leaves were not separated in that

⁵⁰⁹ It is not clear whether it was Silliman or Hitchcock who underlined the words in this paragraph.

part of the work where he gives a drawing of the fossil plant which he has dedicated to you, I suspect you have not seen the high compliment he there pays you unless you have another copy.

I regret that you found Beudant's work so much injured, but I feel quite confident that it did not thus suffer while in my possession. For during the whole time it lay carefully upon a high shelf in my library & was seldom looked at even by myself & scarcely ever by any one else. The fact is the binding was very much injured when I took it from N. Haven & I fastened on the covers as well as I could so that I was satisfied they were in a better state when I returned them than when I received them. I now however regret that I did not put them into the hands of a bookbinder to do the work more more thoroughly.

As you say nothing of my communication concerning the thermometer made a year or two ago, I would still hope it may have escaped your memory that I wished for it, and that you may still be able to send it to me. If I cannot get that, it will render nearly useless all my subsequent observations.

The bearer is Mr. Nathan Belcher, a graduate of our College & my assistant in chemistry some time ago. He has quite a taste & a tact for natural history & I should be glad if you could introduce him to Mr. Shepard or some one who has time to show him your lions. I have requested him to take the package which I sent to your care for Prof. Brongniart of Paris & take it to N. York so as to find an opportunity to forward it.

The Legislature have ordered a second edition of my Report to be printed & the work is already begun. This will afford me an opportunity [the remainder of this letter is in his wife's hand:] to make such corrections & additions as I can make without without expense for they do not allow me to incur any more in examinations.

I have passed a winter of great suffering from indisposition nor does the opening spring afford any relief. I am struggling nevertheless to get on with my chemical lectures. All my troubles result from overdoing in making out my Report while at the same time I had a double share of duties in College. If my health permit I mean to pass through N. Haven in the early part of May. In the mean time believe me respectfully & obediently yours,

E. Hitchcock"

BS to EH, Box 4, folder 1

[Written on outside flaps of letter originally sent BS by EH on Jan. 19, 1832, which see. Old address to BS crossed out, readdressed to EH in Amherst.]

"NHav April 12, 1834

My dear sir,

I received yours & the book by Mr. Belcher & now return you the desired paper which I found among my files.⁵¹⁰ I am very sorry that your health has suffered from your labors – they must have been very arduous & I am very sorry to know from what I hear of the entire cost of the Survey that you must have been paid in a most niggardly manner for a work which does the state more honor than the Bunker Hill monument.⁵¹¹ They ought to have given you for your services all that (I understand) they paid out \$2000. Your work for Brongniart was forwarded & more than 5 weeks ago by a gentleman going direct to Paris. I am sorry that it is utterly out of my power to do any thing more than merely name it in the Journal. I am so completely engrossed that I must keep over many things. I am glad to hear of your new edition. I pray you be attentive to little literary inaccuracies, misquotations & misspellings of French &c. & do not begin so many sentences with #, which I think I should very rarely be used in that way."

[unsigned]

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania.

"Amherst Nov. 8th 1834

Dear Sir,

In exhibiting to my class the other day the elastic force of high steam in inches of mercury, with Dr. Marcet's instruments for that purpose, an occurrence altogether new took place, which is to me as yet inexplicable. The glass tube in which the mercury rises is about three feet long: and I have always been in the habit of suffering the mercury to ascend to the top, before turning the cock to remove the pressure. It had at this time reached the height of about 30 inches, when, as I stood watching it, a sudden force was exerted upon it by which the mercury was thrown with considerable violence against the ceiling of the room, & was followed by steam of considerable elasticity. This rushed also from the stop cock, which I had instantly opened. At the moment, I imputed the explosion to the breaking of the glass tube within the brass globe, which contained the

⁵¹⁰ Referred to in Hitchcock's letter of Dec. 30, 1833.

⁵¹¹ In 1834 work resumed on the Bunker Hill Monument, many times suspended since its opening ceremony in 1825, It was halted again, and only completed in 1842.

mercury & which tube I recollected was slightly cracked in annealing. But on removing the cap of the globe, I found this tube still as sound as at the commencement of the experiment although it was entirely emptied of mercury, which I found (except about a third part of it that was forced through the gauge tube & thrown against the ceiling) at the bottom of the water in the brass ball. The annexed sketch will enable you to understand, without the trouble of recurring to the books, the situation of these tubes & the mercury. [diagram] The tube b b, open at the top, contained the mercury: and into this mercury was plunged the tube e e, open at both ends, so that the steam, pressing upon the top of the mercury, would force it to ascend in the tube e e. And had it driven all the mercury through this tube, there would have been nothing very remarkable in the case I am describing. But how the fluids of it should have been driven in a contrary direction, over the top of the tube b b, so as to be found at d, in the bottom of the brass ball A A, I am unable to imagine. For there was certainly no regurgitation, as a class of more than a hundred can testify. It occurred to me as possible that the crack in the glass might have so expanded by the high temperature applied (250^o Fahr.) as to let through the mercury. But on adjusting the instrument afterwards, exactly as before, the mercury rose slowly & silently to the top of the tube, half a dozen times, without the escape of a particle just as it had ever done in former years when I have used this instrument.

There is, however, one circumstance that I must not omit. When the accident occurred, I found the water in the ball reduced to less than a gill, the usual quantity employed being about a pint. Now this might explain the sudden formation of steam of great elasticity: but I do not see in this fact any clue to explain the regurgitation of the mercury, from the tube b b, into the brass ball A A.

It would gratify me to obtain your opinion upon this case, if I have explained it so that you can understand it. It has occurred to me, also, whether it might not furnish a hint to someone, who has the leisure & ability, for conducting experiments to ascertain the cause or causes of certain mysterious explosions that sometimes take place in the boiler of a steam engine: and with this view, I thought the case possibly worthy of being made public. But I leave that question to your better judgment.

I have drawn up the preceding statement in such a manner that you can if you think best insert it in your Journal. I am quite in doubt whether it deserves such a place.

I cannot yet succeed in getting hold of Dr. Cooper's pamphlet on the connection between Geology & the Pentateuch [sic].⁵¹² And I am very anxious to see it soon as I am about preparing an article on the subject for one of our periodicals. I think you told me you have two copies, and if you can loan me one of them for one or two months it will greatly oblige me. If you could send it to Hartford by the 27th of Nov. to the Mrs. Chester's where I saw you last spring it would reach me in safety as Prof. Hovey will be there at that time to take a wife.⁵¹³ If you could conveniently spare also Conybeare's pamphlet on the present state of geological science I should be very glad to read it.⁵¹⁴ Allow me also to ask whether you know of any one in N. Haven who is a subscriber for the London Christian Observer. I cannot get in all this region nor in Hartford. The numbers for the present year contain an interesting discussion respecting the Mosaic cosmogony.

My health is much better the present than the past season, yet I have become quite apprehensive that a more southern climate would suit me better. And as I suppose you are frequently consulted about candidates for professorships allow me to say that I am willing to be regarded a candidate for any good place in an institution farther south than Amherst, especially for a professorship of Natural History. To add chemistry to this makes the place a very laborious one as you can testify.

Respectfully & sincerely yours,
Edward Hitchcock"

BS to EH, Box 4, folder 1
"New Haven Nov^r 16, 1834
Dear Sir,

I can account for your odd accident only upon the supposition that somebody by meddling or carelessness has turned down your globe on some occasion so far that the mercury ran from the top of the outer tube into the body of the boiler, leaving only enough to raise a 30 inch column when the pressure was applied & that it finally

⁵¹² Thomas Cooper (1759-1839), *The connection between geology and the Pentateuch in a letter to Professor Silliman* (Boston 1833). Cooper, an outspoken materialist, and president of South Carolina College from 1820 to 1834. He believed the bible, correctly viewed, supported materialism and denied the afterlife of a "soul."

⁵¹³ Sylvester Hovey (1797-1840), who taught first at Yale, then at Williams College, was appointed professor at Amherst in 1829.

⁵¹⁴ Presumably Conybeare, *An examination of those phenomena of geology, which seem to bear most direction on theoretical speculation* (London 1830-1831).

increased so that it blew the tube clear & then followed & as the pressure was considerable at the moment when the mercury was ejected, there remained still force enough to blow out of the work also. I feel almost persuaded that somebody did meddle with the boiler & that in some way it had been careened on its beam also. I will therefore withhold the notice until I hear from you again.

I have a capital boiler made for me at Hartford last spring & which performs very well indeed. It is wrought iron & is a miniature of a large boiler in most particulars.

I do not recollect that I have more than one copy of Cooper's book. This however I will look up & forward to you by Mr. Money [?] if possible with the copies of the Christian Observer which I have & will select for you. I think that most of the #ners of geology in England are remarkable for little but ignorance, crimination & bigotry. The editor of the Christian Observer understands the matter & gives very able views. You will see also a geological poem which is very well done.

You shall have Conybeare if I can find him. I think I can. I wish I could find you Hawkins' magnificent work on the #, a yard long when open & with numerous plates.⁵¹⁵ Mr. Mantell sent it to me & the figures & descriptions of them are fine, but the man's letter press is bombast in the worst possible taste, this however does not effect his geological facts & discoveries which are indeed very remarkable. I am writing very late at night & after writing many other letters.

I was down at New York last week & shipped the great ma# iron of the Red River which is to find its last resting place here by the liberality of Mr. Gibbs & family by whom it is presented to me -- a noble present. I will remember you as regards a proof [torn loss] but I hardly think [torn loss] there is any thing at the [torn loss] worthy of your acceptance. I have two offers now at hand from Ohio Western Reserve College for Mathematics &c, one of Natural History, Chemistry, &c or rather the counterpart of mine here. I understand however that the salary is very small.

They would have me open their Lyceum at Brooklyn & I give them two lectures.

In great haste & I fear quite illegible, I remain truly yours as ever,

B Silliman

Prof. Hitchcock."

BS to EH, Box 4, folder 1

"New Haven January 9, 1835

Dear sir,

Mr. Shepard called on me respecting some foreign notices of your work: they were in letters from Mr. Bakewell & Mr. Mantell & you are named in De la Beche's late work on the Philos. of Geology.⁵¹⁶ All these notices I have inserted in the forthcoming No. of the Journal which in a few days will be in Boston where you can see it in season for the lectures I hear you are to deliver (on geology I suppose of course) before the Natural History Society of Boston.

I understand you have still some negotiations to sustain with the government of your state relative to the Geology. If any opinion or attestation of mine can be useful to you, it is at your disposal.

I should like to know the topics & order of your course, the number of lectures, the numbers of the audience whether of the Society or citizens or both, the place where delivered, & the general spirit manifested about the matter. My friendship for you is a sufficient inducement to make these enquiries. I have however an additional reason. You probably heard (for I do not recollect whether I mentioned it to you) that I gave a course of lectures on geology at Lowell in Aug. & Sept^r of last season.

⁵¹⁵ Thomas Hawkins (1810-1889), *Memoirs of ichthyosauri and plesiosauri, extinct monsters of the ancient earth* (London 1834).

⁵¹⁶ Silliman, "Mr. De la Beche in his new work, entitled Researches on theoretical geology [London 1834], has spoken highly of Prof. Hitchcock's Geology of Massachusetts, and has mentioned with particular approbation, his account of the bowlder stones and other transported masses." AJS 27, 2 (1835): 383. In 1837, Hitchcock published an American edition of De la Beche in New York and Philadelphia, with a preface and several substantial footnotes of his own. De la Beche, in a footnote (p. 319), referred to Hitchcock's *Report 1833*, praising him for his "very detailed and valuable account of the erratic blocks in the state of Massachusetts . . . where, with detritus of minor volume, named *diluvium*, they occur in considerable abundance. The proofs he affords of the general northern origin of the whole transported mass are highly satisfactory, coinciding with the evidence afforded by the researches of Dr. Bigsby, Messrs. Lapham, Jackson, Alger, and others, in various parts of North America."

An almost contemporaneous invitation from Salem & Boston (the latter given several times before) induced me to leave my cabinet & drawings in Boston to await my mail there (DVol) March 1 to give a geological course in the Masonic Temple at the invitation & under the patronage of the Society for disseminating useful knowledge.⁵¹⁷ I, of course, feel some solicitude about appearing in Boston & I request you to give me any information favorable or unfavorable, agreeable or otherwise as regards myself, I mean which might be useful for me to possess before going to Boston. I should like to know also what ground you take on controversial topics, such as the extent & proofs of the deluge, the elevation of continents, &c.

After finishing at Boston about the middle of April I return home to pass a few days at our examinations & with my family & then go east again to pass a month in Salem in geological lecturing⁵¹⁸ then return again to New Haven & give my summer course here. From the 24 of Oct^{er} 1833 to July 4, 1834, I lectured without cessation, vacations & all, & they will not have intermitted [?] the present years from Aug. 25 1834 to July 1835. But I desire to be thankful that I am in vigorous health, better than for many years & none the worse for wear.

Hoping that it is the same with you, I remain as ever again very truly

B Silliman

Prof. Edw. Hitchcock”

BS to EH, Box 4, folder 1

[Addressed to EH at “No. 3 Burnstead Place, Boston”]. “New Haven January 31, 1835

Dear Sir,

I thank you for yours of the 28 and I can add that you have given me information that I much needed. It is precise & will enable me to make up my mind.

I now wish to trouble you once more when you are through & quite at ease.

I had thought of \$3 for a ticket for the course & 50 cents for the single lecture. Be so good as to say candidly whether you think this is more than public opinion will bear, for a course that will occupy 6 or 7 weeks & of which all the expenses will be sustained by me. (I receive nothing except from the tickets.)

If any things should occur to you that I ought to know, have the goodness to express it as I used to do to you when you were less known & less practiced in science than now.

I wish very much that I could hear your two lectures & the only regret that I have as regards your delivering them that you did not charge 50 cents.

I thank you for your kind suggestion as to a home in Boston & had I known of the place in season I should have been probably happy to accept the recommendations, especially as the place is usually right & the other is rather far. I am much obliged to the good people for being willing that I should be of their faculty, but the other place is [word missing].

I read your suggestions in the Boston religious quarterly with much satisfaction & cannot doubt that they will do good.⁵¹⁹

I have this evening received a new work, Boase on primitive geology.⁵²⁰ He is of Cornwall & the work is said to contain new views. I do not yet know whether it is sent to me as a loan or a gift or on purchase. If in my power I will loan it to you.

Wishing you a safe return to your family, I remain, my dear sir, yours very truly

B Silliman

Prof. Edw^d Hitchcock”

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania.

“Amherst May 31st 1835

Dear Sir,

I return the books which you have had the kindness to lend me, thanking you for the use of them.

I just returned from Portland where I found as much coal as you would expect in primitive rocks (talse [?] slate, mica slate, gneiss & quartz rock) standing upon their edges.⁵²¹ When I commenced lecturing I found very

⁵¹⁷ In March and April, 1835, Silliman gave a course of public lectures at the Boston Atheneum.

⁵¹⁸ He lectured in Salem in May, 1835.

⁵¹⁹ Hitchcock 1835, “The Connection”: 113-38.

⁵²⁰ Henry Samuel Boase (1799-1883), *Treatise on primary geology, being an examination both practical and theoretical of the older formations* (London 1834). Boase was then secretary of the Royal Geological Society of Cornwall.

little interest on the subject of geology & of course my audience was small. Nevertheless it was very respectable & continued to increase to the last so that although I return almost moneyless I feel some consolation in the belief that I have not injured either the reputation of the science or my own. Indeed I was treated in the kindest manner by the citizens of Portland: But I think it wise for me in future to keep as much as possible upon my appropriate territories, that is at home, wherever that may be.

I have not seen any translations of any of Baron Fourier's able papers on the subject of internal heat. But with those that I have read I have been extremely interested. Would it not be well to translate at least that paper (vide *Annales de Chimie*, Tom 27, p. 136) where he gives the results of his researches but omits the mathematical calculations? Would you publish it if I should send it to you? It would make between 20 & 30 pages. Dr. Bowditch is quite anxious to have it done: and he says that the mathematics of the subject are entirely satisfactory.⁵²²

Very respectfully yours,
Edward Hitchcock"

BS to EH, Box 4, folder 1
"New Haven July 22, 1835

Dear sir,

My duties & interruptions have been so numerous since I received your letter of May 31 that it has lain with many others in view but not answered because I have been constantly wanting the leisure that has never come.

You of course was [sic] not disappointed on the question of coal at Portland & I trust that you have settled the minds of the people on that topic & probably on many others. That you left a favorable impression of the science & of yourself no one who is acquainted with either will doubt. I regret that the pecuniary result should not have been more favorable.

A previous stipulation of a minimum is the insert with the privilege of receiving more if more is received than is requisite to pay the minimum & the expenses. You will perhaps be surprised to learn that I am going (DV) to Nantucket upon a stipulation of that kind (I took my chance however in my late eastern engagements & the result was favorable) & expect to spend the month of September with them.⁵²³

Upon a similar basis I am (providence permitting) to visit Boston again in the spring as last year but chemistry will be the subject. I have never been abroad & shall never go except upon particular invitation. Topics of property to a large amount by others, & public engagement rendered it necessary to make extra exertions in # & this professional road opened & I have worked in it. Hitherto I have reserved [?] nothing of my earnings in this way, & cannot until after the Nantucket engagement is through. I am, it is true, in your & Webster's diocese but I am not an intruder.⁵²⁴ I do not know how long my strength will hold out in this way. I hope for the sake of my family that it will last a little longer.

I have recently received for you a new Journal of "memoires geologiques & paleontologiques" by Boué.⁵²⁵ I have ventured to retain it a little while to look it over but will forward it to you soon.

I suppose you have seen the so-called bird tracks on red sandstone near the ichthyolite locality. Mr. James Deane of Greenfield sent me a plaster & cast & a description which I would publish if I were sure there is no mistake in the affair.⁵²⁶ Will you give me your opinion for I should not like to make a stare about birds as early as the new red sandstone & then be laughed at as Fs-h [Featherstonhaugh] was for his rhinoceros jaw.

Dr. Bowditch put into my hand the memoir of Fourier & I read it except the mathématique. I think it very interesting & at some time would like to publish it. But you will observe in the no. now coming out that the next no. is already nearly preoccupied & my pigeonhole is now pregnant with communications which might lie over

⁵²¹ Hitchcock spent May in Portland, giving lectures while investigating the geology of the city and its vicinity. See his "Sketch of the geology of Portland and its vicinity," *Boston journal of natural history* 1, 3 (1836): 306-47, "Communicated April 6, 1836."

⁵²² See Hitchcock to Silliman, 3.31.36. Hitchcock knew Nathaniel Bowditch (1773-1838) of Boston, mathematician, astronomer, translator of Pierre Laplace's *Traité de mécanique céleste*.

⁵²³ Silliman gave a course of lectures in Nantucket in September, 1835.

⁵²⁴ Silliman refers to John Webster whom both men knew well.

⁵²⁵ In 1832, Ami Boué (1794-1881) announced the founding of the periodical *Mémoires géologiques et paléologiques*. He was listed as Secrétaire pour l'étranger de la Société Géologique de France.

⁵²⁶ The priority of Dr. James Deane of Greenfield (1801-1858) in the discovery of the fossil "bird tracks" is clear from Silliman's and Hitchcock's letters beginning July 22, 1835.

for the January no. The Journal will have a while longer but I am put to an enormous expence for prints -- \$350 at present.

Mrs. Hitchcock made your eastern journey pleasant for you, for when a good wife is with her husband there is always home.

My best regards to her. Mrs. Silliman is at Hartford or she would join, as ever yours very truly,
B Silliman”

EH to BS, Box 5, folder 16

“Amherst July 30th 1835

Dear Sir,

I know of no ‘diocese’ in science, especially in this free country. Every man has a right to go where he chooses especially if he be invited & his object be to diffuse information among the people. It may not indeed be very pleasant for a public man whose motto has been aut Caesar aut nullus to have another one so near him as to eclipse him: but if any of us feel our professional pride wounded by your too near appulse, we have nothing to do but to bear it in silence since we should only make the matter worse by complaining. I know nothing about Prof. Webster’s feelings on this point, but believing as I do that your peregrinations of this sort will promote the general interest in scientific subjects, I hope I rejoice in all your success: and if you should succeed well in a pecuniary aspect I know of no one who is more likely to make a good use of money that yourself. I think you will have an interesting tour to Nantucket. At any rate you will meet with unique things enough I can assure you & you will find the inhabitants intelligent & amiable.

I am examining with much interest the tracks on sandstone of which you speak. I have the originals from which your casts were taken & have pushed my investigations at other quarries until I have nearly made out a strong case I think. I expect to prove the existence of at least five distinct species of Grallae [wading birds] as early as our new red sandstone epoch, some of them of great size. But I do not wish to announce this until I will understand the case. I have already spent several days in the investigation & must spend several more. My intention is to offer you a paper on the subject for your January No. of the Journal.⁵²⁷ I shall give to Dr. Deane the credit of having put me upon the track after these relics: but I hope if consistent you will delay his description until you receive mine as I am sure I shall be able to present a more full & satisfactory view of the case than he can do.⁵²⁸ My paper will be accompanied by one or two plates but they will be very simple.

I have got a translation nearly executed of Baron Fourier’s Memoir in the Annales de Chimie on internal heat & I hope you will find a place for it ere long. I think this tract is a different memoir from that to which you refer, as this is free from the mathematique.

I suppose you have read Featherstonhaugh’s Report on the Lead Mines of the West &c.⁵²⁹ While there is a good deal of ability displayed, it seems to me that there are some blunders so gross & so much of egotism & especially such an indirect and silly effort to convincer the Government that nobody but his own royal self knows any thing about geology that I think somebody ought to give him a few salutary lashes, and if I knew a little more about his history in N. York & Philadelphia I would at least make out a jeu d’esprit for the newspapers. Have you seen the pompous annunciation of his appoint[ment] as ‘United States Geologist’ in the London Philosophical Magazine? As he has been spitting out venom so long against American science I think it right that Americans should begin to cast back some of the gravel of his Rhinoceroides.⁵³⁰

I should think Mrs. Silliman would find her health improved by accompanying you to Nantucket, as Mrs. Hitchcock did by going to Portland and I am confident that she has the organ of benevolence⁵³¹ so well developed that a knowledge of the great increase to your happiness which her company will make will decide her to go. With Mrs. H & my own respects to her & you, believe me truly & respectfully yours,

⁵²⁷ Hitchcock 1836 drew great attention when it was published by Silliman in the middle of 1836.

⁵²⁸ The words here were underlined by Silliman and marked by vertical slashes in the margins. See below, his note to this letter of Sept. 19, 1844. By 1844 Deane felt that Hitchcock had taken too much credit for the footmarks, and they had a testy exchange. For a sensible discussion of this contretemps, see Merrill, pp. 553-59.

⁵²⁹ Featherstonhaugh was authorized by the US War Department in 1834 to make a geological and mineralogical survey of the Ozark region; he issued his report on February 17, 1835: *Geological report of an examination made in 1834 of the elevated country between the Missouri and Red rivers.*

⁵³⁰ For Featherstonhaugh’s great blunder, his “Rhinoceroides Alleghaniensis,” see Silliman to Hitchcock, July 27, 1831.

⁵³¹ Phrenology was then much in vogue in Amherst. Henry Ward Beecher and Orson S. Fowler, both Amherst ’34, were giving lectures and demonstrations.

Edward Hitchcock (over)

P.S. You showed me one or two new volumes on geology in Salem & if you should not take them to Nantucket & would send them to me for a few weeks along with Boué's Journal of which you speak, I should be greatly indebted. Have you any thing recent on the subject of the Deluge? I am about writing on that subject for the Quarterly Observer.⁵³² You can send me a packet probably by leaving it at the bookstore where the Christian Spectator or Journal of Science are printed. Let me know if any expense you have incurred."

[The following copies of letters to Deane, in Hitchcock's hand, now kept with the letter of July 30th, 1835, to Silliman, were apparently sent to Silliman in the autumn of 1843:]

"Copy of Letter to Dr. Deane in replying to his first one respecting the fossil footmarks.

'Amherst March 15th 1835

Dear Sir,

It would be a most interesting fact if the suggestion you make as to the impression on sandstone should prove true. For I recollect but a single similar fact in geology and that is the track of a tortoise on the sandstone of Scotland described in the Am. Journ. Science a few years ago. I am not without strong suspicion however that the case you mention may be a very peculiar structure of certain spots in the sandstone which I have often seen in a red variety of that rock.* The layers of rock having this structure sometimes present an appearance resembling the foot of a bird. But I am satisfied that it is not the result of organization [once living matter] though I confess myself unable to say precisely from what principle it has resulted. But perhaps the case you mention is not of his sort: and I should be quite glad to see these specimens if you can prevent their being defaced for a month or two until I shall visit Greenfield, I shall be much obliged to you.

Accept my thanks for your trouble & believe me respectfully & sincerely yours,

E. Hitchcock

* The true origin of these appearances I have not yet seen given. Oct. 1843. E. H. I refer to No. 1793 of the State Collection & of mine in Amherst College.'

[Extract copied from another letter to Deane, dated Sept. 21st 1835:]

'Dear Sir,

Yours of the 19th instant is received & I am obliged to you for its contents. I think your views to be quite correct as to the tracks: but it will require decided evidence to convince geologists because it places birds so much lower in the rocks than they have heretofore been discovered. Hence I feel anxious to get a full view of the case before describing it &c.'

[Extract copied from another letter to Deane, dated Sept. 15th 1835.]

'I hope to get ready a paper on the subject for the January No. of Silliman's Journal of Sci. in which I shall not fail to acknowledge my indebtedness to you for the first discovery. I wish to make a thorough examination before committing myself in public: for from the nature of the case I know that geologists will try all they can to disbelieve the facts.'

[Silliman to Hitchcock, written in the margins of Hitchcock's letter to him of July 30th, 1835:]

"New Haven. Sept 19, 1844. My dear sir, In searching for Dr. Deane's missing communication I stumbled upon this letter of yours which appears to have some bearing upon your present discussions. I have underscored & side-marked the passage to which I refer. I have your late rejoinder which in # & will soon reach you. The passage which I have marked within will perhaps induce you to modify one or two of your later observations. I will write again soon being at this moment much possessed [?] going to N.Y. but Mr. Dana will attend to proofs. I am to return on Monday next. I have informed Dr. Deane that I have sent you this letter. Yours, B. S."⁵³³

BS to EH, Box 4, folder 1

"New Haven August 6, 1835

Dear Sir,

I am much gratified that you are seriously at work upon the turkey tracks, or bird tracks of whatever kind they may be & you may rest assured that I shall publish nothing upon the subject until I receive it from you. I will

⁵³² Presumably the same as Hitchcock 1835, "The connection."

⁵³³ In the *AJS* 47, 2 (Oct. 1844): 381-401, Silliman published three statements by Deane and Hitchcock: Deane's accusatory letter, Hitchcock's rejoinder, and Deane's response to the rejoinder.

therefore expect you to do justice to Dr. Deane as you are perfectly acquainted with the circumstances & if you see Dr. Deane I will thank you to intimate to him what I have just said. My impressions are so strong in favor of the genuineness of the discovery—judging only from the imperfect copy I have in plaster—that I feel increasingly desirous to have the matter investigated & I do not know in whose hands it can be better placed.

It would be a most interesting geological conclusion to establish that there were birds at so early an era as the new sandstone & especially that turkeys were gobbling & strutting so long before their rival man.

Sooner or later I shall hope to publish your translation of the memoir of Fourier, but as it cannot be very soon, owing to the amount of copy on hand, I would not wish you to restrain its appearance if you wish it earlier & have a channel of publication which would be agreeable to you.

I will place Boué in the hands of Mr. Cook of the Christian Spectator along with Boase on the primitive rocks. I do not recollect any other new work that I think would be interesting to you. I should like to know your opinion of Boase.⁵³⁴

As to Fs, he is not worth the powdered ball that might be shot at him were it not that he is so arrogant & offensive. I believe I can tell you the length & breadth of his appointment.⁵³⁵ Mr. Wilde [?] of Georgia told me in Boston last fall that they had succeeded in “smuggling through Congress” an appropriation of 9000\$ attached to some bill by some covert name & that they would have never got it through had the design of applying it to geological objects been avowed.

Now under this appropriation, for which he had been two years fishing at Washington. Mr. Fs came in, doubtless, by an arrangement with the head of the department, & without the direct action of the government to which, in this affair, I presume he was unknown. In the same manner I undertook the sugar investigation. It was a definite duty to which I was appointed by the secretary of the treasury & Congress knew nothing of the affair until the report came out. Was I therefore entitled to strut as U. States Saccharist? It would be very just to chastise this man. Besides his rhinoceroses (for which he is indicted & confined & # with him in Mr. Mantell’s letters to me) you will find that in his review of Eaton’s Geology 2 or 3 years ago in the North America, he throughout uses cataplasm for cataclysm & if it is not a misprint he appears not to know the differences between a dragee & a poultice. Dr. Mays & Dr. Morton # Phil^a can give you private history if you wish it. I have not seen any thing new on the deluge, except that in Boué. You will find a good deal about it & some things you will not like.⁵³⁶

I go for Nantucket on the 9th instant without Madam but with my son.

Yours as ever,

B Silliman

Prof Hitchcock

If you can, give me any instructions as to obtaining or constructing a revolving electro-magnet so as to give a succession of sparks, to decompose water &c. Have you used the instrument & does it answer for class experiments? I believe I wrote you that I am (DV) to lecture again in Boston next spring, the subject chemistry, & if you think of any thing in galvanism-electro-magnetism & beyond what is usually exhibited with a deflagrator, a calorimotor, Henry’s electro-magnet &c,⁵³⁷ I will thank you to name it to me.”

BS to EH, Box 4, folder 1

“New Haven Octob^r 9, 1835

Dear Sir,

I am vexed & mortified to find that you have not received the books especially as I took the liberty to detain your Journal myself & afterwards to permit Mr. Shepard to do it for a short time.

Mr. S. & Dr. P. are off for a fortnight, say 10 days from now.⁵³⁸ Mrs. Shepard says that the books were returned long ago to Cook to be forwarded & my injunction on M. P. was that they should be returned in season to go with the (then) next no. of the Spectator. Mrs. S. says this was done but they cannot be found at Cook’s & he knows nothing of their being returned. Perhaps this enigma may be solved: a remark was overheard as dropped by

⁵³⁴ Hitchcock’s opinion is not known. Boase’s conception (rigorously secular, with no mention of a divinity), was undermined by the recent work of Lyell, Sedgwick, and Murchison.

⁵³⁵ In 1835 Featherstonhaugh was named government geologist after many months of lobbying for the appointment..

⁵³⁶ The secular Boué treated Genesis as superstition.

⁵³⁷ Joseph Henry (1797-1878) was the first to coil insulated wire around an iron core to make a strong electromagnet. He eventually made a very powerful one for Yale.

⁵³⁸ Percival was commissioned along with Shepard to make the first geological survey of Connecticut. The state published Shepard’s report in 1837; Percival’s was published in New Haven in 1842.

Percival 'that he did not believe you wanted the books so very much.' I therefore think that the Poetical Geologist took a little poetical liberty & carried the books along with him on this present tour. The moment they return I will look into the matter & send you your Journal postage paid, by mail. I regret the thing very much although I do not think there was much to enlighten although there is much to vex you in Boué's remarks on the deluge.

I shall read your remarks on geology with attention and I cannot [sic] much concerned about the Days, provided the Christian world come to the conclusion that time enough was allowed & to this point I think they are fast tending & this will be an admitted & settled opinion at no distant day.

It is more than probable that I may not write my thoughts about your piece but wait until I see you again before I give my opinion.

I was most kindly treated at Nantucket & our science took deep root there

I illustrated the doctrines of internal heat by some fine experiments with a calorimotor, a compound blowpipe & with elementary combustibles & supporters & thus built upon demonstrated facts.

They paid me a reputable sum & my expenses but I do not yet return one dollar in my own pocket but all the earnings of these courses have been absorbed by the losses & demands of the others. If I succeed in the Boston course in the spring, I may then retain something.

I am quite well after all these labors & remain as ever yours very truly,

B Silliman

Prof Hitchcock

I wait with impatience for your report on the birds; the facts are most interesting."

EH to BS, Box 5, folder 16

"Amherst Oct. 23d 1835

Dear Sir,

I am sorry that you should have been at the trouble & expence of sending Bruce's Journal by mail. I could have waited for it though to be sure I wanted to see his article on the deluge.⁵³⁹ The fact is I am preparing an article on that subject for the Biblical Repository⁵⁴⁰ & I have scarcely no means [sic] of getting at the precise state of the question among European geologists. And I now write you to tease your patience once more by lending me any thing you have on that subject. I will mention Sedgwick's Address before the London Geological Society in 1831 & De la Beche's book on Theoretical Geology. I have long had the promise from the author of this latter work but it does not come yet. Have you the Geology of Amalius d'Hallory published in 1831⁵⁴¹ which takes ground opposed to that of Bruce [?]. If you can loan me the above or any other recent works that take up the subject of the deluge & send them by the bearer I shall be extremely obliged to you.

Just setting off on an expedition in pursuit of bird tracks (ornitichnites) [sic]. I subscribe myself in haste yours respectfully

Edward Hitchcock

Nov. 9th 1835. Not having an opportunity to send this as I expected I break it open to add a reply to your letter recently received respecting the article upon Ornitichnology. I have delayed that article from a desire to get at all the facts on the subject & have already travelled 500 miles with this express object in view. It is all new ground & I know that I must contend against the prepossessions of geologists. But I am calculating upon having it ready for your next No. But you must give me as much lee way as possible. I think the article cannot exceed 12 certainly not 20 pages. Cannot you let it come in near the closer? As to the plates I think there must be as many as three & of considerable size: but they will be extremely simple, mere outlines & can be lithographed very rapidly. I should be extremely disappointed not to have this article appear in the next No. But I have done all in my power to get it ahead consistently with other pressing duties -- yet I dare not promise it under two or three weeks. The thing that now delays me most is an effort I am making to get the tracks of some living birds for comparison.

I shall receive no compensation for the article except to ask a few extra copies for circulation among my friends who are not subscribers to the Journal.

In respect to the substance of the article I expect to prove beyond all questions the existence of at least 6 or 8 sorts of birds some of them of most enormous size as early as the new red sandstone.

Sincerely yours,

E. Hitchcock

⁵³⁹ Apparently the *American mineralogical journal* (1810-1814) edited by Archibald Bruce (1777-1818).

⁵⁴⁰ Hitchcock 1837, " . . . deluges," Jan. 1837, pp. 78-139.

⁵⁴¹ J. J. D'Omalius d'Halloy, *Eléments de géologie* (Paris 1831).

P.S. In respect to the books of which I have requested the loan, I will only say that if you have them & should have a private opportunity to forward them ere long I should be extremely obliged.”

BS to EH, Box 4, folder 1

“My dear sir,

Will you send the account of the Turkey tracks &c for the January No. which is now already printing? I am very desirous to receive it & must pay you the usual rate to help out your expenses although the Journal has been hard run.

I wish your communication as early as possible that it may not fail to appear for there is much at hand (If there are drawings I want them early. I will give you as many as 2000 copies as you may want).

I have read your mosaic essay with great approbation in general; some things I will remark upon when we meet. I do not think you have solved the difficulty about the days, but no matter.⁵⁴² The main point is to persuade the religious world to give us time enough & this I think they are fast coming to.

In much haste & hoping for a speedy reply, I remain yours truly,

B Silliman

Prof. Hitchcock

NHav. Nov^r 5, 1835

I just put Boué by mail postage paid.”

BS to EH, Box 4, folder 1

“NHav. Nov. 13, 1835

My dear sir,

In reply to yours I will send you De la Beche, Sedgwick if I can find that address & any thing else which I think may bear on your subject.

I can allow you the time you require for the birds but I am very desirous to bring the figures within the size of the Journal pages. You can occupy an entire page with one figure if you choose & there may be as many pages of cuts as you wish. See my last No. which even in this way & with one lithograph & the map has cost \$450 (They would have cost over \$1200 lithographed) for the figures only. The wood is much cheaper than any other way. You need not of course draw them of that size. We can reduce them. But I will not mar your memoir: they shall be lithographed if it is indispensable but there are many drawings for the next No. You shall have as many extra copies as you wish neatly put up in covers.

A word in reply to let me know how you get on will be acceptable & the drawings should be here by the 10 or 15 of December, earlier if practicable.

My writing is worse than your turkey tracks to decipher but the closing of the mail is at hand.

Yours as ever,

B S

Prof. H.

Amalius de Hallory [sic] I have never seen.”

BS to EH, Box 4, folder 1

“New Haven Nov^r 23, 1835

Dear sir,

Do I correctly understand you? Would you wish a plate four feet long or rising, to exhibit the proportionate step as well as size of the birds' feet, or do you wish simply the proportionate size of the feet, leaving the stride to be understood from description?

As for either supposition, would not one plate lithographed or engraved contain them all? I suspect that a copperplate engraving would be the most economical. Give me, by an early mail, your plans & your wish, upon

⁵⁴² Hitchcock 1835, "The connection," Part II. On p. 323 he quotes Silliman (Bakewell 1833), p. 439) who requires the each of the six days be whole periods to allow for creation of all. EH instead believed that paleontology and geology prove pre-Biblical fossil life and ancient rocky strata, and that scripture deals only with the creation of human life, modern vegetation, and diluvium. There is no reason to believe with Silliman that sun & moon were created on the 4th "day," only that then the already created sun & moon "had their offices and stations assigned them: in other words, that the present arrangement of things in the heavens was then first completely established.”

the supposition that you consult merely the merits of the subject, & your wishes in exhibiting it without reference to expence & then we will endeavor to decide right 'according to law & evidence.'

I am anxious that so interesting a research should have every possible advantage. As to living large birds I do not believe you would find many in our cities; in Peale's Museum, you know, are many birds admirably preserved whose feet I suppose are in full proportion as when living & doubtless their impressions might be obtained.⁵⁴³ There are a considerable number of Asiatic Birds recently received here from Mr. Parker, formerly I think of your college & now a missionary in China. Would their feet be of any service to you? Why are not our domestic birds to your purpose? I hope you will succeed in obtaining casts: I shall want several sets but only upon the condition of paying for them.

I think as you do about Boué. I will find you Buckland & Catcott⁵⁴⁴ if so old a work will be of any use to you. You will of course observe what Lyell has written about it. I can find you Greenough's little book⁵⁴⁵ but he has taken it all back as regards the deluge (in a speech at Edinburgh September 1834).

Hoping to hear from you soon, I remain as ever very truly & respectfully yours,

B Silliman [signed with rare flourish of calligraphy]

Prof. Hitchcock

I am to give in New York in January to the young men's mercantile association as much Geology as four evenings will cover.

I trust I shall have your research in season."

BS to EH, Box 4, folder 1

"New Haven Dec^r 4, 1835

Dear sir,

I have your letter and the very interesting drawings enclosed. I can wait for your MS until the bundle of the Messrs. Adams arrives: you shall have all the proofs both of the prints and the text.

I agree with you that the figures in the proportionate view cannot be reduced any more without injury & that the smallest in the other are as small as possible. I will have the proportional view engraved on copper & as you suggest some of the lines brought nearer together. Perhaps we may bring them all a little nearer but there shall not be any interference & we will not risk anything as regards distinctness. Did you observe that Fig. 10 is not filled; it is left blank. Should it not be filled?

There will be no difficulty in having figure 1 as you have drawn it. We can make a wood cut so as to fold & although there are no pieces of wood so long, we can put two together.

There will be six pages of wood cuts. F. 1 will be the first, fig 2 & 3 the second, 4-5 & 6 the third, 7 to 14 the fourth, & 17 with perhaps some additions the fifth, & 15 & 16 the sixth. Perhaps the figures yet to be sent will make one or more in addition to those named above.

Should there not be a facsimile full size of the greatest impression, that of 16 inches mentioned in a former letter? If sent seasonably it might perhaps be engraved on the copper plate keeping it at its present width, or it might be cut on three blocks of wood as one.

I am quite willing to pay extra for that facsimile & will delay giving the drawing to the engraver until I hear from you again. How many copies of your memoir & plates will you have for yourself, at my cost of course? Name as many as you would like as it is my wish that the supply should be liberal.

Hoping to hear from you soon respecting the plates & to receive the additional drawings, I remain yours very truly,

B Silliman

Prof. Ed. Hitchcock"

BS to EH, Box 4, folder 1

"New Haven December 11, 1835

Dear sir,

I have this day received your drawing of the gigantic bird's foot & I am determined it shall appear. Tomorrow it will go to Hartford to be lithographed which I think will be the best. Proofs of all the prints shall be sent to you & also proof of the text. I am expecting your MS tomorrow & it will be put immediately to press.

⁵⁴³ George W. Peale's museum of natural history in Philadelphia was notable for its vast collections of stuffed birds and the skeleton of a mastodon, the first found in America.

⁵⁴⁴ Alexander Catcott (1725-1779), *A treatise on the deluge*, London 1761

⁵⁴⁵ George B. Greenough (1788-1855), *A critical examination of the first principles of geology* (London, 1819).

I will most cheerfully have the whole 50 copies done up for you with a title & cover & if you want more, give me seasonable notice & you shall have them.

If it is not improper you will let me know somewhere about the amount of your money disbursements in travelling, digging, &c. I shall feel happy, in a less burdened state of the Journal than has lately existed, to contribute a little towards your reimbursement, for I think you have laid science & all who cultivate it under obligation.

I have cut off the small drawings from your great figure & they will go upon the wood cuts which will be arranged as you have directed. The proportionate scale will be engraved on copper & as above the gigantic impress will be (I trust) lithographed.

I suppose what we see is the impress of the convexity of the lower part of the foot & not the supposed convexity of the upper part. The artist proposed to round out & make a little more distinct the swells between the joints of the toes, being guided by the drawing on the comparative scale which is more distinct & more highly finished.

I am willing to have the 75 copies or more if they wish them struck off for the Messrs. Adams. Let me know whether they wish them stitched & covered with title &c: for these they will of course pay a bill which the printer will settle.

I remain as every truly yours,

B Silliman

Prof. Hitchcock”

BS to EH, Box 4, folder 1

“New Haven Dec^r 18, 1835

Dear sir,

The large foot mark will be engraved as it was first, not lithographed, which we find too expensive.

Your new tracks will be engraved also so you will find the description soon & if you pick up any thing also in the same way please send it on promptly.

Your MS is in the printer’s hands. Barber sends you proof of one of the plates today. Please return it quick. You shall have 5 copies mailed & the same number will be mailed for the Adams’s.

I will endeavor to send you Buckland by then.

In great haste going this instant to lecture & fearing to lose the mail,

Yours truly,

B S”

BS to EH, Box 4, folder 1

“Dear sir,

It was very difficult to engrave all that row of figures over again & so we have annexed the reduced figures with an explanatory remark.

The alteration you desire will be made, I believe sufficiently, in the large foot without engraving it over again.

I send you Buckland, Calcot [sic], Chaband & Simmons [?] words of the creation & do notice that any thing also that would serve you.

The article [on the] deluge in the Edinb. Encyl. contains some interesting notices & a good list of references to authorities.

I regret that Prof. [Moses] Stuart should darken counsel by words without knowledge: his effort must be a failure.

Yours as ever,

B Silliman

Dec^r 25, 1835

I have looked over Lyell’s last edition (the fourth) which he has sent me a copy of. There is nothing new on your subject although a good deal that is new & interesting.

I could have sent you a copy which also I have from him, of his 3d edition, observing that you quote from the first. He has a good deal about the deluge & among other things he alledges [sic] the perfect form of the lips of the craters in Auvergne as proof hat no debacle can have happened since they were thrown up -- but probably this remark is in his first edition.”

BS to EH, Box 4, folder 1

“New Haven, December 25, 1835

Dear sir,

In my note by Mr. Adams today I forgot to thank you for your present of the cast in plaster. I think it very successful & it enables one to convey a good idea of the foot.

I request you to have two sets of whatever you may do in that way made for me & at my expence, which I shall insist upon. Indeed if they are made for sale I may be a purchaser of several sets to send abroad.

I have recently very kind letters from Mr. Mantell, Mr. Lyell & Mr. Conybeare, the same whom we killed some years ago in the Journal.

I consulted our learned Grecians about your term & they decided that the t must have an h after it: Ornithichnites &c, & I have ordered the said h to be duly inducted into the middle not of a bird # but of the name for it.

Yours truly,
B S.”

BS to EH, Box 4, folder 2

“Hartford February 24, 1836

Dear sir,

I write to apprise you that Prof Kingsley, having perused M. Stuart’s review of your geological discoveries saw at once that the learned but over confident & vaunting theologian had laid himself open to an unanswerable reply & I encouraged him to make it. He has since done it in a masterly manner & with his characteristic address & acumen; about 10 pages print.⁵⁴⁶

The drift of the argument is this: Prof. Stuart has laid down a cannon [sic] of criticism which he has not in a single instance applied through his entire voluminous dissertation. Had he applied it in such a manner as he had propounded it, it would have made him into the greatest absurdities to avoid which he has himself reasoned upon such principles as if followed out would allow the geologists all they ask for.

I have not time to give you an instance but will direct that a proof be sent you as soon as one can be obtained. There will be still time for you to say that you do not wish to have these criticisms published, provided you feel so, but if you feel as I do, it is something to have gained to our camp such an ally as Prof Kingsley. I presume that in that case you will not object & especially as the geological ground is all left open to you. I think it may be a week or ten days before the proof is ready but in the meantime we should be glad to hear from you, & you may as well direct your letter to me & also to Prof. Kingsley as I may be off for Boston before your answer arrives.

My address in Boston is Mrs. Jackson, no. 21 Somerset Street.

I remain as ever yours very truly & with much esteem,

B Silliman

Prof. Ed. Hitchcock”

EH to BS, Box 5, folder 16

[Mar. 1, 1836. This document consists of two huge sheets approximately 17 x 11 in. One sheet bears Hitchcock’s letter, with its wide margins filled with portions of the poem and notes. The verso of this sheet and one side of the other sheet bear the rest of the poem and footnotes. The footnote numbers were inserted within the poem, not added afterwards.]

“Amherst March 1st 1836

Dear Sir,

I am very happy to learn that Prof. Kingsley has examined Prof. Stuart’s article on geology & shall be gratified to see the results of his investigation in print in the Journal of Science when I suppose (although you do not definitely state) they will appear. I have indeed made some remarks on Prof. Stuart’s article which will be inserted I suppose in the April No. of the Biblical Repository.⁵⁴⁷ But I presume I have not entered at all upon the

⁵⁴⁶ Silliman’s Yale colleague James L. Kingsley (1778 -1852), professor of Latin, Greek, and Hebrew, published a judicious rebuttal of Stuart: *AJS* 30, 1 (July 1836): 114-30.

⁵⁴⁷ Hitchcock, “Remarks on Professor Stuart’s examination of Gen. 1. in reference to geology,” *Biblical repository* 7, 22 (April 1836): 448-87. In an article on geology and revelation in the preceding issue of the *Repository*. Stuart attacked Hitchcock by name. Hitchcock replies by saying that he regret’s Stuart’s mocking tone and his lack of knowledge of geology. Stuart perpetuates earlier ideas that are now discarded and fails to see “that geology

ground taken by Dr. Kingsley. I am glad to find that the subject is enticing the attention of so able minds as we may hope that the truth will be soon elicited. Of one thing we may I think be certain judging from what we know of Prof. Kingsley, viz. that he will make no criticisms that he cannot sustain. We all know that he never steps in the dark.

You will see that I have inflicted a poem upon you for the Journal of Science. I seriously doubt whether it deserves mention, my Pegasus has become so old & lame. But if you do not insert it please to retain it till I can send for it as I have not time to copy the notes.

I have delayed getting ready the casts you wish of the Ornithichnites on account of the severity of the weather as it is more difficult to prepare them when very cold. I can have the sets ready however soon. Shall I send them before the canal is open?⁵⁴⁸ I hardly know of any other channel of direct communication.

Respectfully yours,

Edward Hitchcock

The Sandstone Bird

To the Editor of the American Journal of Science

Sir, The account given in the last number of the Journal of the Ornithichnites, or footnotes of birds that lived in sandstone days, especially the *Ornithichnites giganteus*, aroused my long slumbering muse to an effort: and I have the vanity to send the result to you; recollecting that you do sometimes admit into the Journal articles intended chiefly for amusement. Admit or reject mine, however, as your better judgement & taste shall dictate, & I shall be satisfied. [This paragraph was loosely crossed out.]

The Sandstone Bird

Scene: Banks of Connecticut River

Geologist alone: examining the footmarks of a bird on stone (*Ornithichnites giganteus*)

Foot-marks on stone! how plain and yet how strange!

A bird track truly, though of giant bulk,

Yet of the monster every vestige else

Has vanished. Bird, a problem thou hast solv'd

Man never has: to leave his trace on earth

Too deep for time and fate to wear away.

A thousand pyramids had mouldered down

Since on this rock thy footprint was impressed:

Yet here it stands unaltered though since then,

Earth's crust has been upheaved & fractured oft.

And deluge after deluge o'er her driven,

Has swept organic life from off her face. (1)

Bird of a former world, would that thy form

Might reappear in these they ancient haunts.

Oh for a sorceress nigh, to call thee up

From they deep sandstone grave, as erst of old

She broke the prophet's slumbers. But her arts

She does not practice in this age of light.

Enter Sorceress

"Let the light of science shine;

I will show that power is mine

teaches us that the earth was in existence a long period before the creation of man and the existing races of animals, and that this opinion is not inconsistent with the Mosaic history."

⁵⁴⁸ The canal from New Haven (via Farmington, bypassing Hartford) reached Northampton in 1835; it was closed for the winter months.

Sceptic, cease my art to mock
 When the dead start out of rock.
 Bird of mighty foot (Oh vain!
 Ornithichnites call'd by name:
 Science thus her ignorance shows,
 On a footmark to impose
 Name uncouth; while by my arts
 Into life the biped starts:)
 Bird of sandstone era, wake;
 From thy deep dark prison break.
 Spread thy wings upon our air,
 Show thy huge strong talons here:
 Let them print the muddy shore
 As they did in days of yore.
 Præadamic bird, whose sway
 Rul'd creation in thy day,
 Come obedient to my word:
 Stand before creation's lord."

The sorceress vanished, but the earth around,
 As when an earthquake swells her bosom, rock'd.
 And stifled groans, with sounds ne'er heard before,
 Broke on the startled ear. The placid stream
 Began to heave and dash billows on the shore;
 Till soon, as when Balaena (2) spouts the deep,
 The waters suddenly leap'd towards the sky;
 And up flew swiftly, what a sawyer (3) seem'd,
 But prov'd a bird's neck, with a frightful beak.
 A huge shaped body followed, stilted high,
 As if two mainmasts propped it up. The bird
 Of sandstone fame was truly come again;
 And shaking his enormous plumes & wings,
 And rolling his broad eye around, amaz'd,
 He gave a yell so loud, and savage too,
 Though to Iguanodons & kindred tribes (4)
 Music it might have seemed; on human ear
 It grated harshly, like the quivering roar
 That rushes wildly through the mountain gorge,
 When storms beat heavy on its brow. Anon,
 On wings like mainsails flapping on the air,
 The feathered giant sought the shore, where stood
 Confounded, he who called the sorceress' aid.
 Awhile surveying all the monster paus'd;
 The mountain, valley, plain, the woods, the fields,
 The quiet stream, the village on its banks,
 Each beast & bird: Next the geologist
 Was scanned, & scanned again with piercing glance.
 Then arching up his neck, as if in scorn,
 His bitter taunting plaint he thus began.
 "Creation's Lord!", the magic of these words
 My iron slumbers broke; for in my day
 I stood acknowledg'd as creation's head; (5)
 In stature & in mind surpassing all.
 But now, O strange degeneracy! one,
 Scarce six feet high, is style'd creation's lord!
 If such the lord, what must the servants be!

Oh how unlike Iguanodon, next me
 In dignity; yet moving at my nod.
 The Mega-Plesi-Hylae- Saurian tribes (6)
 Rank'd next along the grand descending scale:
 Testudo next (7) below the Nautilus,
 The curious Ammonite, & kindred forms; (8)
 All giants to these puny races here,
 Scarce seen except by Ichthyosaurian eye, (9)
 Gone too the noble palms, the lofty ferns,
 The Calamite, Stigmara, Voltzia all: (10)
 And O what dwarfs, unworthy of a name,
 (Iguanodon could scarce find here a meal,
 Grow o'er their graves! Here too, where ocean roll'd,
 Where coral groves the bright green waters grac'd,
 Which glorious monsters made their frolic haunts,
 Where strange Fucoides, strew'd its oozy bed, (12)
 And fish of splendid forms & hues, ranged free,
 A shallow brook (where only creatures live'
 Which in my day were Sauroscopic call'd, (13))
 Scarce visible, now creeps along the waste.
 And O this chilling wind! a contrast sad
 To those soft balmy airs, from fragrant groves,
 That fann'd the never varying summer once.
 E'en he, whom I've heard call'd creation's lord,
 (I call him rather Nature's blasted slave;)
 Must smother in these structures, dwellings called,
 (Creation's noble palace was my home;)
 Or these inclement skies would cut him off.
 The Sun himself shines but with glimmering light,
 And all proclaims the world well nigh worn out:
 Her vital warmth departing and her tribes,
 Organic, all degenerate, puny, soon
 In nature's icy grave to sink forever. (14)
 Sure 'tis a place for punishment design'd,
 And not the beauteous happy spot I lov'd.
 These creatures here seem discontented, sad:
 They hate each other & they hate the world,
 I cannot, will not live in such a spot.
 I freeze, I starve, I die: with joy I sink
 To my sweet slumbers with the noble dead."

Strangely, and suddenly the monster sunk,
 Earth op'd and closed her jaws and all was still.
 The vex'd geologist, calling aloud
 Reach'd forth his hand to seize the sinking form:
 But empty air alone he grasp'd. Chagrined,
 That he could solve no geologic doubts,
 Nor have the history of sandstone days,
 He passe'd out bitter words, 'gainst sorcery's arts:
 Forgetting that the lesson thus taught pride,
 Was better than new knowledge of lost worlds.

[Footnotes:]

1. This poem proceeds on the supposition, now extensively adopted by geologists, that all the organic remains found in the secondary rocks at least, belonged to animals & plants that lived in the long # that might have intervened between "the beginning," as described in Genesis, & the creation of man. During this interval it would seem probable that several distant races of organic beings were successively created & destroyed; each race being adapted to the climate & other conditions of the globe.

2. The whale: the largest of known animals, sometimes weighing fifty tons.
3. "A sawyer is a tree, which being undermined by a current of water, & falling into the stream, lies its its branches above water, which are continuously raised & depressed by the force of the current." Webster.
4. The Iguanodon is an enormous herbivorous reptile, between 60 & 70 feet long, discovered in England in the rocks, but no longer alive. It was more than twice as long as the largest crocodile. Another kindred animal was the Megalosaurus; also near 70 feet in length: several others now extinct might be named.
5. Before the discovery of this Ornithichnites, the most perfect animals that had been found, as low down in the rocks as the New Red Sandstone, were a few reptiles, called Saurians: so that birds must have been decidedly the most perfect animals that then existed: ~~at least as far as our present knowledge of those times extends~~: though it has been recently announced in the journals that the tracks of quadrumanous animals have been found in new red sandstone in Germany. But until I have seen the details of this discovery, I am not disposed to let it spoil my poetry: for as to some quadrumanous animals, I think that birds might successfully compete with them the palm of superiority.
6. An abstraction by poetic license for Megalosaurus, Plesiosaurus, & Hylaeosaurus. These are # reptiles, found fossil in England. They do not indeed occur as deep in the rocks as the new red sandstone. But since all became an extinct race, the anachronism may be pardoned in poetry.
7. The tracks of the tortoise (testudo) have been found on the # red sandstone of ##.
8. The Nautilus & Ammonite are curious chambered shells found petrified chiefly ##.
9. The Ichthyosaurus, another huge & extinct saurian animal, was remarkable for the size of its eye; the orbit in some specimens measuring 10 inches in length & 7 inches in breadth.
10. The organic remains found in the rocks of the temperate & frigid zones, correspond more nearly to those now found alive in the torrid zone, than to those in the temperate & frigid. Indeed, there can be no doubt but the northern hemisphere was once covered with tropical forests, such as the palm & the ferns of huge size. The Calamite, Stigmaria, & Voltria [?] are names given to the plants found in the new red sandstone which do not correspond to any now growing upon the globe.
11. A sea fern (Gorgonia Jacksoni) not less than 20 feet high: and this tribe of organized beings form a large part of what are called coral groves. Hence there is sufficient ground for representing the valley of the Connecticut as once covered in tropical ocean, containing groves of coral. The enormous bird that is described in the text (probably at least twice the size of the ostrich) is supposed to have frequented the shores of this ocean in search of food; and to have left its footmarks upon the mud, which was afterwards hardened into stone.
12. Fucoides are fossil sea weeds, resembling plants of the same tribe now growing in the tropical seas.
13. Sauroscopie: that is, seen only by the eye of the Ichthyosaurus. The 'shallow brook' is the Connecticut river.
14. If it be admitted that the climate, vegetation & animals of this valley were tropical, when this bird lived. who will say that its present condition would not seem, even to a rational being in similar circumstances, to be one of deterioration & approaching ruin?"

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania.

"Amherst March 31st 1836

Dear Sir,

One great object of addressing you at this time is to make a suggestion that I may forget if I delay it. It seems to me that the time has come that you should print a General Index to your Journal and I think it would be a good time to do it with your 30th volume. Often I find great trouble in looking up facts, that is, it requires too much time. Perhaps it would be better to have the index published separately at a separate charge so that subscribers could take it or not: though I do not believe any fault would be found if you should devote as much of your July No. as is necessary to this object. This suggestion you will of course adopt or not as you think proper.

As the little poem on the Sandstone Bird which I sent after you had left N. Haven is not to appear in the April No. of the Journal I think it will be best not to trouble you with it farther as probably July would be too late for it to appear. If I print it all perhaps I had better offer it to a Newspaper. Please to keep it till I can send for it.

Dr. Kingsley's article on Prof. Stuart which he kindly sent me is keen as a razor & as clear as crystal. There can be no answer to it unless it be in the indulgence of bad feeling. From your account of the article I thought that I had not touched the same spot: but you will see in the April No. of the Bib. Repository that I have attacked Prof. S. on the same point though much less thoroughly than it is done by Dr. Kingsley.

I have lately sent an article on the Geology of Portland to the Boston Society of Nat. History to appear in the next No.⁵⁴⁹ As Dr. Graham and I were both coming out on the Geology of Maine & as his was far the most important paper, we agreed that he should offer his for your Journal & I would send mine to Boston.⁵⁵⁰ Mine contains 8 or 10 drawings.

I have got nearly ready to send you a translation of one of Baron Fourier's Memoires on the Mathematical Theory of Heat in the *Annales de Chimie*. It may occupy from 15 to 20 pages of your Journal but not more.⁵⁵¹ I hope you will insert it soon: for it seems to me that scarcely any English Geologist except perhaps De la Beche understands this subject at all. Dr. Bowditch assures me that the mathematical reasonings on which the Baron forms his conclusions are perfectly satisfactory.

I have got a good pencil sketch of Mount Ararat in Armenia with some statements about the diluvium in that region from Mr. & Mrs. Perkins, missionaries to Persia. And I have thought of offering the drawing to you as frontispiece to some one of your Nos. It is possible however that I may make use of them in an article I am preparing for the *Biblical Repository*.⁵⁵²

If I recollect right, you wished me to send you two sets of casts of the Ornithichnites. They have been delayed on account of the severity of the weather which makes the casting or rather the drying difficult. It is impossible now I suppose to send them until the navigation opens.

As I do not know whether you have left, I shall direct this to N. Haven. I perceive that you are going again to N. York & I am glad to learn that you are likely to realize to a good degree what the alchemists sought after in vain.

Respectfully yours,

Edward Hitchcock"

[Silliman note on the side treated as the envelope:] "E. Hitchcock. Mar. 1836. not ans., but substantially done with.

E. Hitchcock's Fourier's Memoire.
Index to the Journal"

EH to BS, Box 5, folder 16

"Amherst June 4th 1836

Dear Sir,

If you can find a moment's leisure you will much oblige me by giving your opinion as to the course I ought to pursue in relation to the geological survey of N. York.

After several weeks negotiation with Gov. Marcy (which I recollect with any emotions rather than of pleasure) the business stands thus: He will appoint me geological surveyor with an assistant whom I shall name and allow me to take the First District which embraces the country along the Hudson from Lake George to N. York & embracing Long Island, with a salary of \$1500 per annum provided I will spend five months in the summer in exploration with an occasional intermission to visit my family and so much of the winter months at my own house as are necessary to determine and arrange the specimens & make out the reports without interfering however with my College duties.⁵⁵³

In this case I am to bear all the expences except perhaps something for the packing &c of the specimens. I have felt this compensation to be inadequate & have more than once made up my mind to reject the offer. But then I feel the need very much of some change in my pursuits to try to wake up a little more energy in my rather enfeebled system & the region of country is as it seems to me a pleasant one to examine. Every thing indeed invites to the enterprise except the difficulty of leaving home & the compensation. Now the question is how it strikes you? Can I consistently engage on these terms, giving up as I must my salary here while absent? Shall I by doing it bring the science of geology into discredit? I regard the offer as in fact made for the five months of

⁵⁴⁹ Hitchcock, "Sketch of the geology of Portland and its vicinity," *Boston journal of natural history*, 1, 3 (1836): 306-47.

⁵⁵⁰ No such article by Graham appeared in the *AJS*.

⁵⁵¹ Fourier 1837. Hitchcock's introductory note, signed July 4, 1836, said he got Ebenezer Burgess, tutor at Amherst College, to translate the French text (1824). Hitchcock knew Nathaniel Bowditch (1773-1838) of Boston, mathematician, astronomer, translator of Pierre Laplace's *Traité de mécanique céleste*.

⁵⁵² See Silliman to Hitchcock, 3.6.37.

⁵⁵³ For Hitchcock's negotiations with Governor William Marcy, see letters he wrote the governor in April and May, 1836 (Simon Gratz Collection, Historical Society of Pennsylvania, and copies in EOH Box 5, folder 1).

outdoor service, for as to the winter or indoor labour I should expect to determine & manage my specimens whether required to do it or not.

I suppose that probably Prof. [Ebenezer] Emmons & Mr. [Timothy] Conrad & Prof. [Chester] Dewey or Richard Taylor will be engaged in this survey as geologists. It has been suggested that political considerations—that is Van Burenism—entered into the business but I have no evidence of it.⁵⁵⁴ I rather think from all that I have seen that the Gov. means to do right: but he is sadly ignorant of what ought to be done in my opinion & of what scientific men ought to receive as compensation. I fear greatly that after all the business will fall into the hands of inadequate men. Ought this fear to operate upon any who think themselves qualified to execute the work to undertake it at a cheaper rate than what they ought to receive?

I will decide the question in a very few days. I fear I must do it even before you can write me though I will delay as long as I think it will answer for I do not wish to do any thing that will seem improper to my scientific friends.

I wrote you before you left Boston suggesting the forming an Index to your Journal & sending a Geological Poem on the Sandstone Bird. Have you seen my letter? I also wrote you more recently saying that I should probably send for that poem; but as I have had no opportunity you can do as you judge best about putting it into the Journal, next No.⁵⁵⁵

In great haste yours sincerely,
Edward Hitchcock”

BS to EH, Box 4, folder 2

“New Haven June 7, 1836

Dear Sir,

In answer to your enquiries I should say decidedly that self respect & respect for the honor of science should induce you to decline the proposed appointment when tendered with so incompetent a recompense. Deducting your expences & that portion of your salary which you must relinquish, you will have left but a dishonourable recompense for a man of tried ability & established reputation in so arduous a profession. But I must qualify my negative. You feel that your health would be reinvigorated by this [badly blotted sequence of words] I think you will be satisfied in accepting the appointment [blotted sequence] agreeable to the recompense while on other grounds the appointment is accepted.

I was consulted among others as to the best plan of [blotted sequence] however is not the view that has been adopted. I have seen with much concern that this great undertaking, sustained too by a liberal appropriation, is in danger of being crippled by division & subdivision & by a paltry chaffering & beating down of men of high character to make with them a good bargain for the state. For instance, Dr. Torrey & Gov^r Marcy parted upon a point of \$300; for the Gov^r because Dr. T. returned money by his # insisted that he should abate \$300 out of the \$1500 & Dr. T. with great propriety refused & abandoned the endeavor. This I had from himself in New York.

I think with you that there is great danger that this duty will pass into the hands of ## inferior men [blotted sequence] from highly qualified men [blotted sequence].

I received your other letter at Boston & ought to have answered it sooner [blotted sequence] lecturing at home & abroad has brought me in arrears in my correspondence & I am now striving to bring all up: your turn was at hand & I was thinking of you.

The suggestion regarding the index for the first 30 volumes of the Journal is wise, still the expence made me hesitate, as I suppose only those who knew the entire work would purchase the index. If I do not do it now, I may hereafter at a future time, for it may be done at the close of any volume although a round number would be preferable.

The poem I thought had been returned while I was away & supposing that to have been the fact, I had ceased to think of it. I do not now know where it is, as it came while I was at Boston. I have never seen it but I will look it up & you shall hear from me about it.

Dr. [Joseph] Barratt of Middletown thinks he has discovered in the red sandstone there algae or fucii 9 or so feet long & very numerous. He even thinks there is a very large fish but is less confident of this: no bird tracks.⁵⁵⁶

⁵⁵⁴ For the New York survey, see Merrill 1924, p. 187. Matrin Van Buren (1782-1862), then Vice-President (President the next year), was a prominent organizer of the Democratic party.

⁵⁵⁵ Hitchcock's "Sandstone bird" was instead published in *The Knickerbocker* in December 1836.

⁵⁵⁶ In July 1837, Hitchcock identified numerous fossil footmarks, including those of a lizard-like Sauroidichnite "S. Barrattii" named for Dr. Joseph Barratt (1796-1882): Hitchcock 1837. Barratt afterwards did find large "bird

In haste as ever truly yours,
 B. Silliman
 Prof. Hitchcock”

EH to BS, Box 5, folder 16
 “Amherst June 20th 1836
 Dear Sir,

I thank you very much for your promptness in replying to my last letter respecting the geological survey. Your view coincides essentially with mine as to the compensation. Yet after deliberating on the question for a long time I have finally concluded to engage in the work. But I distinctly told the Governor that I did it on other grounds than pecuniary considerations. The hope of recruiting my exhausted energies is the principal object that influenced me to accept. Yet I have a thousand misgivings on that head. But I must go forward & expect to start for Newburgh as early as Thursday of this week in my wagon fitted up à la mode geologique.⁵⁵⁷

Last Saturday I carried to Northampton to put on board a canal boat a box containing two sets of casts of the *Ornithichnites* with several examples on stone. You will find two specimens of nearly every variety. I have done my best to imitate the originals: yet the resemblance is not exact. As you insist upon making me a pecuniary return for them I will say that if they reach you safely I suppose the value will be about \$10 per set. Or if you prefer to send me specimens or casts or petrifications they will be quite as acceptable.

I have had on hand for several months a translation of Baron Fourier’s most interesting paper on central heat. I cannot now send it from want of an opportunity. But I hope you will find room for it in the *Journal* ere long.

Ornithichnites have been found in Connecticut. I hope ere long to be able to give you some account of them.

In much haste I remain yours sincerely & respectfully,
 Edward Hitchcock”

EH to BS

June 28, 1836. [Original missing. Following portion is from *AJS* 31, 1 (Jan. 1837): 174-75.] “*Ornithichnites* in Connecticut. Extract of a letter from Prof. E. Hitchcock, dated June 28th, 1836.” “In my account of the *Ornithichnites* in New Red Sandstone, given in the last January number of the *Journal*, I intimated that perhaps they might be found at a place called the Cove, in Wethersfield, Ct. I went to Hartford last year mostly to visit this spot; but having been there informed that no rocks existed at the Cove, I did not go there. Yet recently a young gentleman of the Junior Class in Amherst College, whose father resides near the spot, and who had carefully examined my specimens of *Ornithichnites*, informs me that he has discovered them at the Cove in considerable abundance and variety. But I will give you an account of them in his own words.”

[In several paragraphs, a careful account of foot tracks in stone in Wethersfield (and two in Rocky Hill), with dimensions and descriptions, keyed to the terminology of Hitchcock’s footmarks.]

“Mr. Hammer also describes vegetable remains of considerable size upon the same rock; and from his account, I suspect them to belong to tribe of *Fucoides*.

I hope that you, or the gentlemen engaged in a geological survey of the State, will be able to visit this spot, to see whether any discoveries can be made, or to make any corrections of the above statement, that may be found necessary.”

BS to EH, Box 4, folder 2
 “New Haven July 6, 1836
 Der Sir,

I was sorry to learn by yours from Newburgh that you had been obliged to relinquish your undertaking on account of ill health, but I cannot understand how you are to lose so much money except by a forfeiture and for performance & if any such thing has been insisted I trust that physical infirmity would excuse it.

I wrote you at Amherst enclosing \$20 for the models &c. I trust the money came safely to hand with my thanks. The box has arrived & some of the most conspicuous specimens were exhibited at my concluding geological lecture a week since.

tracks” in the Middletown region, and published his findings (with reference to Hitchcock) in his *Geology of Middletown & vicinity* (Middletown 1846).

⁵⁵⁷ Hitchcock nonetheless withdrew from the New York survey shortly afterwards.

As far as I can judge I think your views sound but some I understand express doubts. I am told there is a pert review in the last *Knickerbocker* by a Mr. Chapin of Wallingford which may or may not need attention from you. This man has some geological knowledge but he is in no way entitled to criticize you & especially without seeing your specimens.⁵⁵⁸ I hope you will be able to find some of the bones as this would put all cavils to rest.

I return the Geological poem not because I do not think it has merit nor because it is not amusing but because I think it would appear better in some other work. It ought to have been sent before but it was with Mr. Kingsley & did not reach me till lately.

The new facts at Wethersfield & Rocky Hill are very interesting but they were too late. Perhaps you can add to them for the next No. Dr. Barratt of Middletown writes to me that they find enormous algae and other oceanic plants (fossil) at Middletown in the sandstone: also a fish but no tracks at Chatham or in that vicinity.

As every yours very truly

B Silliman

Prof. Edw. Hitchcock”

BS to EH, Box 4, folder 2

“New Haven July 25, 1836

Dear sir,

I am unable to recollect whether I have fulfilled a duty allotted to me by Mr. Brongniart in a letter dated March 8, 1836 and received May 2. It was to thank you for—in his own words “J’ai recu dans bon temps le beau presente qui m’a fait Prof. Hitchcock & je suis inexcusable de ne pas lui avoir remercie.” He begs me to make his very particular apology whenever I see or write you & to say that he will “lui addressser directement, tres incessamment.” His letter I am now deciphering (not always an easy task) & making an analysis of it that I may answer it.

[t] contained an important document respecting a new work on the manufacture of porcelain & I may perhaps give a notice of it in the Journal.

I have received the translation of Fourier but fear it cannot go in immediately owing to long and urgent communications first in engagement & thank you for forwarding it.

I have in person reproved the author of the attack on you in the *Knickerbocker*. It was, as I supposed Mr. Chapin of Wallingford, the same who two years ago wrote on trap veins & dykes in the Journal. I protested against the extreme injustice & impropriety of attempting to set aside facts which he had never examined, having never seen a specimen or a cast & the meanness also of attacking from behind the bush a man who had labored so hard for the development of truth. He attempted to shelter himself behind Percival -- hinc illae lachrymae. I had myself heard & heard much more of [J. G.] Percival’s sneers & told Chapin he was an able but an unamiable man who loved to carp & find fault. I told Chapin he would hear from you in some way on the subject, but this does not commit you. I have also protested in a public lecture before a large audience (I read to them a part of Mr. Kingsley’s reply) against this attack on you & also at the same time protested publicly against Prof. Stuart’s rude & ignorant assaults.

As ever yours truly

B Silliman

Prof. Hitchcock”

EH to BS, Box 5, folder 16

⁵⁵⁸ Silliman had already published A. B. Chapin’s “Junction of trap and sandstone; Wallingford, Conn.,” *AJS* 27, 1 (Jan. 1835): 104-12. In the unsigned article (*Knickerbocker* 8 [June 1836]: 578-82), Chapin praised Hitchcock for rising above his deprivation of a liberal education, but objected to his “enthusiasm which forms so large a portion” of his writings and to his exaggerations. Hitchcock’s bird tracks are mistaken readings of impressions rising from his “prolific fancy.” Chapin also objected to the idea in Hitchcock 1833 that Mounts Tom and Holyoke “were once united, and that the pass between them has been excavated by the waters of the Connecticut, or by the currents of a primitive lake.” Surely the water would have gone around the mountain! In his rebuttal (“Ornithichnology defended,” *Knickerbocker* 8 [Sept. 1836]: 289-95), Hitchcock writes that each of the author’s objections is easily refuted; he is invited to look at original impressions in Amherst or casts of some in the Lyceum of Natural history in New York, Yale, or the Boston Natural History Society. He took as Hitchcock’s own the idea of an “excavation” of the gorge between Tom & Holyoke whereas Hitchcock had introduced it in order to refute it. In his unsigned riposte (“Ornithichnology reconsidered,” *Knickerbocker* 8 [Oct. 1836]: 456-58), Chapin merely repeats his accusations.

“Amherst August 16th 1836

Dear Sir,

I should have replied earlier to your obliging favours of the 6th and 25th ult. had I not been absent on a trip to Saratoga.

I thank you for the extract from Mr. Brongniart's letter. I have sent several copies of my Report to Europe but have heard of the receipt of no one before except by Mr. De la Beche, and I have reason to suppose that some of them are lost.

I certainly feel deeply indebted to you for your open & generous defence [sic] of my Ornithichnology. I hope you have not thereby incurred the hostility of any whose friendship is valuable. I expected that my article on that subject would be attacked, and I can only say that my wish is that all assaults may be as futile as that of Mr. Chapin appears to me to be. Dr. Percival I have always supposed regarded me rather contemptuously and I doubt not but apart from my real inferiority & inaccuracy there is a cause why he should not like me. I have endeavored always to show that there is a harmony between science & religion & I have no doubt but he supposes there is a discrepancy. In spite of all his sneers about the bird tracks however & in spite of Mr. Chapin's arguments I am more & more convinced that they will hold their place. My strongest wish is that all the gentlemen who are sceptical [sic] would come to Amherst & look at my specimens. Even the casts which I have sent abroad do but very poor justice to the originals: or rather of my large & most satisfactory specimens. I have taken no casts. I wish that you could see them.

Can it be that Mr. Chapin feels injured by me? A few years ago he sent me some facts in relation to the rocks bordering on Massachusetts & if I rightly recollect I never replied to his letter on account of some doubt as to his place of residence. But I inserted nearly all his letter in the second edition of my Report (p 353 & 410) with a handsome bow of thanks as I could make.⁵⁵⁹ He quotes I see from my first edition: does he know the use I made of his letter? & does he not feel hurt by my apparent neglect? I have sent an answer to the Knickerbocker and if the editor do not insert it I mean to get it into some widely circulated newspaper. I have made up my mind not to be greatly disturbed by these attacks unless they appear to me more forcible than those of Prof. Stuart & Mr. Chapin. I know that my writings abound in vulnerable points & that many things in my character, habits, & connections are well calculated to stir up prejudice & invite attack. Nevertheless I am determined to push ahead though in some seasons of despondency I feel inclined strongly to give over any further scientific efforts. But so long as you & a few other scientific friends shall think that my efforts do any good, I mean to hold on if life & strength be spared. At this moment I am upon another geological track which interests me very much & probably I shall by & by offer the results to your Journal. I have discovered on Mount Holyoke a great number of (nearly 100) diluvial vallies most evidently the result of that mighty rush of waters from the north of which there are so many traces in our country and such (as it happens) is the topography of the mountain [torn loss] the evidence of their being diluvial vallies is most conclusive. I want also to extend my observations to other parts of the country if possible. I do believe that the great battle between the diluvialists & the fluvialists is to be decided in this country and I cannot see why the former must not prevail. The Lyell dynasty may rule for a time: but truth will outlive Lyell & Boué & Macculloch for it is deeply engraved upon our everlasting mountains.

Do just as you think best with Fourier's Essay & I shall be satisfied. I got it translated at the suggestion of Dr. Bowditch but am not anxious to have it appear.

The present season has been a very barren one for me as to intellectual effort. That everlasting bantering & indecision about the N. York survey upset my health & I have done nothing since. I wish to say here however that in the end Gov. Marcy made me & my assistant a handsome remittance in consequence of the expence we have been at in our outfit so that I am satisfied that the Gov. meant to act honorably & liberally throughout. But his notions of compensation seemed to be very contracted.

Sincerely yours,

E. Hitchcock”

BS to EH, Box 4, folder 2

“NHav. Aug. 19. 1836

⁵⁵⁹ In the 1835 edition of Hitchcock 183 3, p. 353: “Since the publication of the first edition of this Report, I have received from Mr. A. B. Chapin of Wallingford, Ct., an account of the position and mineral contents of the steatite in Somers, as well as important additional facts relating to other rocks in that vicinity, which will be given in the proper place, and for which I am much obliged to that gentleman.” Here follows a few sentences quoted from Chapin about the steatite of Somers. On p. 410, Hitchcock reports that from Chapin he has learned about greenstone “in several places in Connecticut on the east side of Connecticut river.”

My dear sir,

Yours of the 16th is just received & I give you a hasty reply being on the point of starting for the gold mines of Virginia to be absent probably 5 weeks.⁵⁶⁰

There is a notice of Dr. Buckland having communicated to the Ashmolean Society at Oxford a notice of your discoveries. It is taken from the London Atheneum & is respectful altho the notice in the paper is short. I shall insert it with a notice of the discovery of bird tracks at Middletown by D. J. Barratt along with enormous vegetables, fucii as he supposes.⁵⁶¹ He promises a more full account for the next No. of the Journal.

I know nothing of Mr. Chapin's antipathies nor do I care for Percival's. The man is very proud & vain, sceptical & envious & however bright in talent he wants the moral humility which is the true foundation of greatness.

Don't mind any of these folks great or small but pursue your own honorable course, observing as much condensation as you can in your report. The Journal is open for the diluvial facts & on my return I would like to know whether you wish room & how much. Some illustrative wood sections might be well.

I am glad Gov. Marcy has done you some justice.

In much haste, as ever yours,

B S

Prof. H."

BS to EH, Box 4, folder 2

"New Haven Octob^r 7, 1836

Dear sir,

I have De la Beche's work in the philosophy of Geology but have no geological work of a later date than Lyell's fourth edition which I received from him last spring.

I have been incurring a heavy expence in getting my periodical works made up & bound & I have a considerable number of sets from 50 to 100 vols. or nearly 100 in a set. Among them are Frenissai's [?] Bulletin Annales de Chimie, Trans soc. of Arts, London, Revue Encyclopedique, Scotch & English Journals, Franklin Journal, Nor. Am. review, Southern review &c &c, any and all of which are at your service.

As to the diluvial question, Mr. Bakewell writes me under date of July 28, 1836, 'Geology is in rather a strange state in England at present: the rich clergy begin to tremble for their incomes & seek to avoid their fate by a renewed zeal for orthodoxy and are making a great clamor against Geology as opposed to Genesis. I have no doubt that this is the true cause why Buckland's Bridgewater treatise though announced & reviewed in the quarterly last May, has not yet appeared.⁵⁶² I have no doubt the reviewer was Lyell who at bottom hates Buckland cordially as I am assured by Mantell. The reviewer brought forward all those points momentarily which Buckland would have been glad to pass sub silentio, namely that B. had now given up the Noachian deluge so far as it was supposed to explain any geological phenomena, and also stating how much he differed from the literal account of creation in Genesis.' The entire letter is very instructive & entertaining. Greenough in an address at Edinb. formally recanted the diluvial opinions expressed in his treatise on stratification.

I know not that I can do you much good but any thing I have or we have will be at your service.

I have not yet seen your reply to Chapin having but recently returned from a long absence in Va.

I shall be glad to receive your account of the new bird tracks although too late for the October No. which is closed.

I remain dear sir as ever yours very truly

B. Silliman

Prof^r Edw^d Hitchcock"

BS to EH, Box 4, folder 2

"New Haven Nov^r 1st, 1836

Dear Sir,

I am much gratified by your success in discovering bird tracks and hope it will end in the discovery of bones. I am strongly inclined to believe that we have some of them in those red faced stone bones, those condyles

⁵⁶⁰ On the trip to Virginia, see Fisher 1866: 377-79. Silliman's trip was commissioned by New York "proprietors."

⁵⁶¹ Without naming Barratt, Silliman drew a short account from his letter of March 8, 1836, "Bird tracks at Middletown, Conn., in the new red sandstone," *AJS* 31, 1 (Jan. 1837): 165.

⁵⁶² Buckland 1836.

& that long slender bone if not in those in the East Windsor rock. I ache for a comparative anatomist to settle these questions, but where is he?

If I can obtain no satisfaction otherwise I would almost resolve to send them over to Dr. Mantell to be returned.

I will reserve at least 10 pages for you. I know you too well to believe you will stay within 6 or 8 as, if winter does not set in with snow, you will discover more tracks.⁵⁶³

In a parcel by stage of journals for Messrs. Adams I find Dr. Barratt's remarks as I prepared them for the Journal but kept them back that he might make more original observations.

There are several other letters of less importance but if you give him a general acknowledgment of priority in discovery as well as of civility, it will answer.

I should like the drawings [of bird tracks] as early as may be that we may plan them, whether for wood, lithographs or engravings.

I remain my dear sir as ever yours truly,

B Silliman

Prof. Hitchcock

Be so good as to inform the Adams that the two nos. of the Journal for them are going today by stage."

BS to EH, Box 4, folder 2

"NHav. Dec^r 2, 1836

Dear Sir,

I am suddenly pressed with the report of the doings of the British association, 50 pages & wish to insert them entire as they have just arrived in Jameson's Journal. Suppose therefore that your additional views of the bird tracks should be announced for the April No. & let the piece lie over which would afford ample time for drawings &c, & to finish the whole to your mind. I should however still wish the piece as early as might be that it might be secure of insertion, for there is considerable progress made in the April No. already & your Fourier piece is in already & printed.

If you will release me from my engagement & accept a place in the next No. it will greatly oblige me & should it so happen that you have forwarded the piece before this arrives, I should still wish that the request might stand & be answered.

As ever yours very truly,

B Silliman

Prof. Ed. Hitchcock"

BS to EH, Box 4, folder 2

"New Haven December 8, 1836

My dear sir,

Yours of the 5th is at hand. Your communication will make, I think, over 20 pages of the Journal & several plates will be required so that it would now be difficult to find either room or time, as I am pressing the Journal to have it off before the ice locks us up. I regret it but you will recollect that the first idea was about 8 or 9 pages & a few tracks. Certainly I do not object but am obliged to you for doubling the quantity & I am quite willing you should extend it as you propose & am moreover willing to give you some aid in regard to the expence of the proposed casts which I think a very good idea. Perhaps I may aid you in another way. I have engaged to give some geological lectures before the New York Lyceum of Natural History between the 4th & the 20th of January. My son will be with me & we can ascertain for you beforehand whether they will permit you to copy their birds & animals, their feet, I mean. I cannot entertain a doubt that they will consent & if you arrive in New York as you probably will in our last week, we will aid you if we can do you any good.

I do not see then any way but that the publication must be postponed & I have no doubt you will increase your proofs and you can if you please quote Buckland's approbation as the work is now in this country.

Your piece shall be printed early & you shall have as many spare copies as you please & have them before the Journal is published if you desire it.

Write to me again whether I shall make any enquiries for you in New York.

Yours as ever very truly

B Silliman

⁵⁶³ Here and in succeeding letters it is a question of an article that Hitchcock reduced from its early draft to just two pages: Hitchcock 1837, "Fossil footsteps."

Prof. Edw. Hitchcock”

BS to EH, Box 4, folder 2
 “New Haven Dec^r 20, 1836
 Dear Sir,

I lost no time in writing to Dr. James S [?] Chilton, New York, stating your object and its claims and desiring him to lose no time in making application in your behalf & as a favor to myself. Returning from Hartford this evening I find his answer as follows: [here a large rectangle was cut out to remove BS’s signature on the other side] ‘I [...] who is the proprietor of the amer [...] request you wished me to [...] He [...] to allow Prof^r H. to take whatever casts he may wish, and that he will be happy to render him any assistance he may require in so doing.’

I also called on Mr. Peale, but he seems to think it would be a difficult matter to take casts from his specimens because the greater part of them are wired down in the cases. He said however, that he has several birds which are not yet in the cases, and that he would be pleased to allow him to take casts from these and any others which he could get at.⁵⁶⁴

Thus you see you have full liberty in the Museum which is most important to you & should you find any thing interesting in the other I do not doubt you can copy it & I am satisfied that the Great Menagerie of living animals will be open to you.

I have received Dr. Buckland’s work from the author & congratulate you upon your triumph over your puny critics in this country. Dr. B. gives your discoveries full credit, has copied in his artful style the large foot & one of the plates of tracks, & you are placed in full relief. He has given a capital & beautiful section of the structure of the crust of the globe combining all there is in De la Beche & Brongniart with the addition of the intrusive rocks & the volumes in place & with many drawings of animals & plants. The section is four feet long. Mr. Bakewell⁵⁶⁵ is now copying it on a scale of 16 feet by 2 feet 7 in. for my coming lectures in NYork.

Let me know if I can serve you in anything else & believe me always
 [signature cut out].
 Prof. Ed. Hitchcock

I was informed in Middletown that Mr. Barratt has recently discovered a very large and [sic] fine track in a paving stone but I had not time to see him or it.”

BS to EH, Box 4, folder 2
 “New Haven Jan. 2, 1837
 Dear sir,

The only reluctance I should feel in complying with your request is that I dislike to part with an original gift copy from an eminent man. Still I will consent even at the sacrifice of this little feeling rather than you should be disappointed.

If Messrs Adams could have the work carefully taken apart so that it might be bound again without being soiled by the printer’s fingers, it would gratify me & still more if the original cover could be replaced & I would then release them from their offer to give me, say more than one copy in addition. But I do as you see best.

I should be sorry if you do not lecture & hope you will reconsider that decision. At least bring some good specimens that scepticism (of which there is a share in NYork on this subject, Dr. DeKay for example) may be relieved. The address in NYork No. 2 Bond Street, Mrs. Sheets.

In great haste yours as ever
 B Silliman”

BS to EH, Box 4, folder 2
 “New Haven Mar. 6, 1837
 Dear sir,

I was thinking it was time to hear from you about the bird tracks & I will insert your notice & find you a proof.

Would it not be well to abstain from coining learned names for things that are still so uncertain as the sauroid birds, or birds with sauroid feet? I should have preferred to leave that matter until there is more ground for

⁵⁶⁴ Rubens Peale (1784-1865) emulated his father Charles by founding a museum in New York in 1825.

⁵⁶⁵ The artist Robert Jr. Bakewell (1790-1875), the son of the British geologist Robert Bakewell, emigrated to the US and became a teacher of drawing at Yale.

a decisive opinion & for the present merely to describe the fact of the resemblance, but you will of course act as you please.

I shall certainly be desirous of publishing your revised & extended account of the bird tracks &c especially if you will arrange your drawings so that in general they may occupy but a page each in a wood cut. If it should be necessary to have a larger place for sequences of tracks, it may be furnished with engraved or lithographed. If the piece is to appear in July it would be desirable that it should be begun early, say in April, that it may not be crowded out or that it may not from its length encroach late upon the miscellanies.

I should think however that if you are to make much research in the summer your report can hardly appear before fall, say October (you will please give me reasonable notice what to expect).

As I have not seen De la Beche's work in a long time, I cannot now (having no other copy) say anything very definite about it, but I have no objection to the publisher or editor saying that his work & its republication are approved & recommended by Professor Silliman & if you choose, you can add that the copy was furnished by him, but this last is not important.

I remain as ever truly yours,

B. Silliman

Prof. Hitchcock

P.S. Lyells' 5th edition has just arrived. I have not yet received the copy he promised me but I have one on loan from a friend. I have as yet scarcely glanced at it.

By the way, are you not sometimes a little too personal in your published remarks? Poor McCulloch [sic] it seems, as I learn from Dr. Mantell, was a martyr to dispepsia [sic] & his bad feelings were connected with physical disarrangement.

I was very sorry to observe you impute 'cunning & duplicity' to Lyell.⁵⁶⁶ Whatever may be his religious opinions, I believe no writer is more frank in avowing his views & I cannot see any thing more in his remarks than theologians have often written regarding the Deluge. In his 4th edition particularly he is very reverent to the creator & directly recognizes creative & sustaining wisdom & he opposes strenuously in all his editions & attacks atheistical notions of the connexion & gradual developement [sic] of species.

You have now sounded the note of infidelity for Lyell & so it will go on your word through all the theological world in America, while I really think you had not good cause for the accusation & it looks a little like courting favor with those who will only turn upon us the harder, since the finest geological writer of the age is confessed by an eminent geologist to be an infidel. I should write something in connection perhaps: the review will not however be seen in England, but that part will do mischief. This step is only adding to yours & my load of odium theologicum, and on the freedom of my remarks. I perhaps felt this subject the more from being for some time past in rather intimate correspondence with Lyell who regards me as an active friend & the fact is I have done a good deal to # the use of his work in this country. I think you should not have placed him with Dr. [Thomas] Cooper

My letter is like a peacock. The tail is longer than the body & perhaps you will think the note is as dissonant."

EH to BS, Box 5, folder 18

"Amherst March 12th 1837

Dear Sir,

I have always found it wise to follow the advice of judicious friends and I was on the point (after receiving your last letter) of requesting you not to insert in the Journal my statement respecting the fossil footmarks when I received the proof sheet. It would be unreasonable to request you to omit it now though I should prefer not to have it appear. I was induced to send it to you because I had frequent enquiries from scientific gentlemen respecting the facts & I thought such a summary might be acceptable. I have employed a good many learned volumes chiefly as a convenient means of describing the essential characters & partly to carry out what I had begun in my first paper.

⁵⁶⁶ In Hitchcock 1837, ". . . deluges," pp. 78-139, Hitchcock summarized early and modern ideas about deluges. He objected (pp. 128-30) to Lyell's denial (Lyell 1830-33) that there were ever universal deluges that swept the entire earth, and that when the universality of the Noachian deluge is insisted upon, that flood must be considered a supernatural event "far beyond the reach of philosophical inquiry." "We know nothing of Mr. Lyell's religious creed. But there is something in such an ambiguous mode of treating scriptural subjects that reminds us of infidel cunning and duplicity." He also (p. 131) was severe on Macculloch (*A system of geology*) who wrote that the Mosaic account gave "imaginary causes of the deluge," and even more severe (pp. 132-36) on Boué (*Mémoires géologiques et paléontologiques*) for asserting that the Noachian account is merely revery and superstition.

I thank you for your rebuke respecting the personalities in my writings. Let the righteous smite me; it shall be a kindness: and let him reprove me; it shall be an excellent oil which shall not break my head. I confess that I was not aware that the fault which you mention was one to which I am particularly prone: but this is no proof that I am not. I wish however to make a few remarks upon the two cases which you mention: and though they may not justify me in your view they may be some palliation of my offense.

In the first place I have never written any thing with more reluctance than the censure which I passed upon Dr. Macculloch & Mr. Lyell. The writings of the former have always been studied by me with great pleasure & profit & even when I saw the exhibition of a spirit not only unchristian but unmanly, I compiled my reproof of it with one of the highest compliments I could pay him by comparing his work to the Principia of Newton. Mr. Sedgwick as President of the Geological Society passed as severe a censure upon him as I did without any compliment. And as to Mr. Lyell I had studied his works with great profit & I knew too that he was President of the Geol. Society & possessed great influence so that if my remarks should ever reach him they would not only cast me out from his favour but also probably from the good opinion of nearly all the distinguished geologists of Great Britain. Nevertheless I have always tried to make it my rule of action not to let private & personal considerations prevent me from a decided vindication of revealed religion from all covert or open attack. I have sometimes gone further—perhaps unwisely. By no scientific man in our country have I been treated with greater courtesy & respect than by Dr. Cooper. But knowing his hostility to revealed religion I could not in conscience let a fair opportunity pass that presented itself of avowing my reliance on a crucified Saviour & of kindly expressing my regret that he # on the borders of eternity should not have such a rock to rest upon. The consequence was as I expected that all intercourse between us has been suspended. But my conscience is quite at rest on the subject. On the same principle in the same paper that contains my remarks upon Mr. Lyell I have censured much more decidedly the anti-christian sentiment of M. Boué, President of the Geological Society of France. I know that it may be presumptuous for an obscure individual to assail men in such high places. But in relation to those who seem to me to me to assail Christianity my motto has always been --

*Tros Tyriusque nullo discrimine mihi agetur*⁵⁶⁷

In the second place I took special care to say that I founded my opinion respecting the religious views of Mr. Lyell & the character of Dr. Macculloch entirely upon their published writings so that others could judge concerning them as well as myself. I was willing to find anything in Mr. Lyell's works favorable to scepticism [sic], still I could not come to any other conclusion from the passages that I quoted & I shall be surprised if such is not the general impression. If he be a decided believer in Christianity why does he not say so? A single sentence would settle the point. Did any one ever read the geological writings of Prof. Buckland or of Prof. Silliman & doubt whether they were the friends of revelation? A man to be sure is not bound to introduce his religious creed into every scientific essay: but if he excludes it when his subject brings him into direct contact with Christianity, it is a presumption against his belief in it.

Thirdly, in all my writings on geology I have admitted that some geologists are infidels. I have endeavored only to show that I had no evidence any of them are atheists. Suppose then any should be led from what I have said to rank Mr. Lyell among infidels. I can not see how it will weaken the force of any thing I have written or bring any more odium upon those geologists in our country who have endeavored to vindicate their science from the charge of irreligious tendencies. On the contrary, if the religious community see that we are as eagle eyed as themselves to discover hostility to revealed truth & by no means disposed to defend any statements because made by a distinguished geologist, I think it will tend to diminish the odium under which we labour because it will increase the confidence of religious men in the soundness of our own creed.

Finally, I am willing to admit that I feel more jealous for the honor of Christianity than for the honor of Geology, just because the former is far the most important. In my view they are in perfect harmony with each other: but were I compelled to elect between them, ought I to hesitate which to abandon? I have no fears that you or any one else who knows me will hence conclude that I have but a feeble attachment to geology. I rather fear that you will conclude that I have an inordinate affection for it. Nor after having bearded the lion in his den & fought a drawn battle in defence [sic] of geology do I fear that I shall be seen to be courting favour with theologians. Yet I am glad to acknowledge my high respect for most of these men in our country & to rank many of them among my best friends. And I have so high an opinion of their candour & intellectual ability that I feel a strong confidence that were they to study geology as thoroughly as they have theology, there would soon cease to be any difference of opinion between us. While I mean to convince them that I am a decided friend of revelation

⁵⁶⁷ Correctly *Tros tyriusque mihi nullo discrimine agetur*: “Twixt Trojan and Tyrian I shall make no distinction” (Virgil, Aeneid I. 574).

& opposed to infidelity in every form, I mean also to show them that I am not afraid with equal boldness to vindicate geology. I believe such a course will secure their favour but if not I shall try to do without it.

It does not strike me that any thing I have pointed out in Mr. Lyell's works need prevent you or me from recommending them as you have done & as I have done in my limited sphere. I feel more free to do it now than if I had not expressed my dissent from any of his remarks that have a sceptical aspect. I cannot as you do, however, regard him as "the finest geological writer of the age." In the collection & brilliant exhibition of facts he may stand first. But in the power of reasoning accurately & comprehensively from those facts (the highest attainment of the geologist) I should place Macculloch, Conybeare, Sedgwick, De la Beche, Elie de Beaumont & perhaps Mantell & Boué decidedly before him. This however is a mere matter of opinion & of little consequence.

You may think that I have not much mended the matter by this letter. But I have at least given you a plain & honest exhibition of the principles by which I have been guided. I know that they are not calculated to gain popularity for me. But they form a very soft pillow on which I rest my head at night. Should they prove the means of losing your friendship I can only say that I should regard it as a severer trial than to lose the favour of any other man living.

Yours &c
E. Hitchcock"

EH to BS, Box 5, folder 18

Copy in EH's hand of preceding letter, prefaced with "Letter to Prof. Silliman in answer to one from him dated March 6th 1837."

BS to EH, Box 4, folder 2

"New Haven March 17, 1837

My dear sir,

I had no doubt as to the expediency of publishing your summary & my objection to the use of a term describing the sauro-footed animals was founded merely upon the mere [?] certainty—but still—as the resemblance is real it is not worth the while to alter it.

As to our harmony, I assure you nothing has occurred to disturb it & I have no feelings but those of cordiality nor sentiments but those of confidence & esteem towards you.

In all your principles of action avowed in your letter I entirely agree & Dr. Cooper & Boué richly deserved the protest you entered against them. I thought however that the evidence ought to be much stronger to justify placing Mr. Lyell in the same company & particularly with the aspect given to his character & mind. I have not yet examined his last edition & cannot say whether your impressions would be strengthened or not by the perusal. I also have the happiness to reckon some of my best friends among the clergy & I believe with you that if they were masters of our subject they would think as we do. Some of them are candid & forbearing, others find no insuperable difficulties, others are silent because they feel that they do not understand the matter, but a few are loud, confident & uncharitable while it is obvious that they know not whereof they affirm. I think you have silenced one of this class [Moses Stuart], at least you & my colleague Prof. K[ingsley], but I see strong marks of a settled purpose on the part of some to hold no terms with geology & to insist upon the literal & limited understanding of the history. But they will find themselves deserted, for the matter will in time come right.

I wish to know whether you will probably be ready for my next No. or whether you would prefer to divide & appear in two Nos. provided you are not ready in toto.

I shall reserve room for you to your full intent if you can be ready or if you cannot be ready for July, you shall have full room in October. I should like to know your views soon because it will not be long before we begin on the July no.

As ever very cordially & truly, your friend,
B Silliman

Prof. Ed. Hitchcock"

EH to BS, Box 5, folder 18

"Amherst April 11th 1837

Dear Sir,

I am much obliged to you for your letter of the 17th ult. I did not believe that there was much danger of the harmony between us being interrupted: for I have long thought that considering what human nature is & how powerfully we are affected by the different circumstances in which we are placed, no two men could hope to come

nearer to an agreement on geology & religion that we have. Yet well knowing that little causes if disregarded often produce great effects I alluded to the possible interruption of our friendship with a view to prevent it.

The more I examine myself & my writings the more I am convinced that there was some ground for your suggestions and I trust that I shall be more cautious in future.

I have given up the idea of having my article on fossil footmarks ready for the July No. of your Journal: for the rivers will be so high in the early part of summer as to cover most of the localities which I wish to reexamine. I am more afraid that I cannot get it ready for the October No. The article itself will not I trust be very long. But the drawings will be quite numerous. I do not mean to make any that will not really illustrate the subject. As soon as I can be satisfied that I have nearly exhausted the subject I will get the article ready. During the winter I have received some specimens from one locality among which I find one very distinct species not described by me & probably two. One of the most singular & anomalous species I have sketched on the opposite page. That species ought to have been added to my lists in your Journal: but I believe I have omitted it.

There is some prospect that the Government of this state may want me to pick up the crumbs of our geology though I have received no intimation as yet from the Governor.

Have you read Dr. Wiseman's work just finished at Andover on the connection of science & religion?⁵⁶⁸ It ought to shame those Protestant divines (he is a Catholic) who are battling the geologists. It is said that Prof. Stuart was highly pleased with the work & yet the author falls in with the views of geologists respecting the age of the world. I am satisfied with you that some of our theologians are determined to wage everlasting war with geology: but calm argument & such works as that of Dr. Buckland will silence if it does not satisfy them.

Respectfully & sincerely yours,
E. Hitchcock"

[Here a large drawing labeled "Sauroidichnites terrisimus" (?) showing tall "horns" rising from a schematic triangle and accompanied by this phrase: "The dotted part shows a portion of the stone that is elevated by the pressure of the toes."]

BS to EH, Box 4, folder 2
"New Haven April 15, 1837

Dear Sir,

I have yours of the 11th and am gratified by your remarks which are entirely in unison with my own feelings.

I see the necessity of postponing your memoir & should very much doubt whether you can be ready with it before October. Indeed the July No. is already more than half filled & this matter in the printer's hands even before the April No. is out. This has been delayed by the necessity I have been laid under of examining & reporting upon Davenport's electro-galvanic machine, but the Journal will be abroad I trust next week.

I should suggest as regards your drawings that they be arranged with reference to making entire pages of wood cuts as was done with Hildreth's memoir on evol. I would not however preclude a larger plate where size of track may require it; in any event those that are ready should be placed in the engraver's hands as early as may be.

I have a letter from Mr. Brongniart dated Jan^y 6 '37, a long and interesting one towards the conclusion of which he remarks: 'The discovery of the impressions of the feet of birds by M. Hitchcock presents new facts of great curiosity. I have seen the plaster models in the collection of the geological society of London. Is it not possible to obtain some specimens for the Museum of Natural History at Paris? We will pay all necessary expences upon this subject. The absence of bones of the birds is not more singular than those of the absence of the bones of the singular animals of Hilburghausen⁵⁶⁹ in Bavaria: they may occur elsewhere!'

I think you would do well to furnish the Paris Museum with a good collection as they will pay for it. It is very desirable that the plaster should be of a firmer texture than that furnished me last summer: several of those specimens were badly broken.

⁵⁶⁸ Benjamin Silliman Jr., "Twelve lectures on the connection between science and revealed religion; delivered in Rome, by Nicholas Wiseman, D.D., Principal of the English College, and professor of the University of Rome" (Andover 1837), *AJS* 32, 1 (July 1837): 209-10. Protestants are told that it would do well to read this Catholic's book, but this review says nothing about how Wiseman reconciled science and mosaic history. Cardinal Nicholas Patrick Wiseman (1802-65) lectured widely on the connections between science and revealed religion, saying these were not opposed and could be reconciled.

⁵⁶⁹ In 1833 was found the lower triassic footprint of the archosaur *Cheirotherium* in Hilburghausen (Thuringia).

It may add to your inducement to furnish M. Brongniart that he informs me 'We are going to add to the Museum of Paris a new & grand gallery in which the collections of mineralogy & geology will be considerably exhibited & we hope that many new & instructive specimens may be added.' I have written to him that I should invite your attention to the subject of his request.

Dr. Wiseman's book I have not read and you will observe that I have inserted a short notice of it in the April No. of the Journal: it was written by my son but expresses my own opinion. It was my intention to review Buckland & in communion with him to present our case forcibly but decorously to the public. As you say I would be calm & always respectful but I am less disposed than ever to shrink from this conflict: it must be sustained until the truth is triumphant.

That [torn loss] subjects are of some interest to our country may perhaps appear from my having been invited this season in form to New Orleans, Cincinnati, Syracuse & Bridgeport & I understand New York is about to speak again thro' the Mercantile Library Association: but I stay at home this spring much occupied in building some accommodation for my books, papers, &c &c, which are now far advanced & I hope in good time to show them to you.

I remain as ever, dear sir, truly your friend

B Silliman

Prof. Hitchcock

I hope that in packing up 'the geological crumbs' of your state you will keep a goodly number for yourself. You will observe that in my notice of the New York Geol. Survey I have spoken out on the subject of compensation."

BS to EH, Box 4, folder 2

"New Haven Nov^r 2, 1837

9.00 Thursday PM

My dear sir,

I think you will be glad to see Dr. Daubeny of the university of Oxford. He is now here & I have just parted with him.⁵⁷⁰ He is a very affable & accommodating man (in person small, below the middle height, but with a fine head) & puts you perfectly at your ease in a moment. I shall give him a line to you & I should think he may be with you about the middle of next week. Shew [sic] him all your tracks & if you can go with him to any locality it would be well. Perhaps it would be gratifying to him to see D. Humphrey so lately from England.

I regretted very much to pass you on my return & endeavored to arrange differently but could not bring it about.

Our kind regards to Mrs. Hitchcock. I have not time to enlarge as it is getting late & it is no light affair that I am to have Dr. Daubeny to hear me tomorrow morning & must attend a little more to my preparation.

I remain my dear sir as ever very truly your friend,

B Silliman

Prof. Hitchcock

Dr. Daubeny has just returned from Canada & is now going to Boston."

BS to EH, Box 4, folder 2

"New Haven December 5, 1837

Dear sir,

I am glad you shewed attention to Dr. Daubeny who since his return to NYork has written to me & expressed much satisfaction in his interview with you & in what he saw; he speaks very favorably of New England & Boston. He now goes south & will return to NYork in the spring on his way home but will first visit Jamaica.

I have put up for you some New Jersey marls which only wait for an opportunity; if you know of one, you had better send. There is a Mr. Smith here, a missionary for Siam, who informs me that he may go in a few days. I suppose we might send you some marl from the Chesapeake which now lies or did lie upon our wharf: a # load was imported for agriculture.

Genl Cowles of Farmington was here for a few weeks since with a very rich marl full of fresh water shells & he said it was abundant in Farmington count. I should suppose there would be very little analogy between your marls & those of the N. Jersey peninsula & of the Chesapeake.

⁵⁷⁰ Charles G. B. Daubeny (1795-1867) spent nearly a year in the U.S. See his "Sketch of the geology of North America, being the substance of a memoir read before the Ashmolean Society, Nov. 26, 1838" (Oxford 1839).

Prof Rogers is in Phil^a & his assistant now here.⁵⁷¹ James Whelply says that you can probably obtain his report of him altho' these papers are scarce. There are some reports you may remember 2 or 3 years ago in the American Journal by the Messrs. Rogers on marl, especially of Virginia.

I do not know at present of any artist who will come to you & work well & work cheap. I suppose Mr. Bakewell would visit you in the spring when there are vacations in the schools but this I presume would be too late for your object.⁵⁷² Should the gov't engrave your drawings, would it be worth while to propose to them to furnish the plates for the Journal at a low rate or give the use of the plates (the copper I mean), I paying for paper and handling?

I should be very glad to see a specimen of your beryl & wish indeed that this monopoly (loco-foco non obstante) might be established.⁵⁷³

I am (D.V.) going to New York again in January vacation to lecture to the association at Clinton Hall⁵⁷⁴ & I have overtures again from some other Institutions there. If I can be of any service to you there, I beg you to command me. I am to be there from Jan. 1 to 20.

I remain my dear sir as ever yours very truly,

B Silliman

Prof Ed. Hitchcock"

EH to BS, Box 5, folder 18

"Amherst January 9th 1838

Dear Sir,

Accept my thanks for your letter of the 5th ult. as well as for the specimen of Green Sand from N. Jersey which was left at the public house here by some unknown person. I am glad to have an opportunity to compare this with a green sand which I have found in this state. I am also quite anxious to get a specimen of real marl from N. Jersey as well as from the Chesapeake of which you speak in your letter: and could I see a specimen from Farmington I should be much gratified, for I presume that is like ours. Should it be in your power to send any of these by the bearer I should be greatly indebted to you. If you could also loan me those fossil bones from E. Windsor long enough to have a drawing taken of them you would confer an additional favour.

I send you a specimen of beryl from Royalston which will enable you to judge of it. I have taken measures to secure the use of the locality for a year.

No slave has worked harder than I have this winter upon the soils, marls &c of this state & yet the work of analysis is but just begun. If I make my report it must be a crude one.

In much haste I remain truly yours,

E. Hitchcock

P.S. The bearer Mr. Partridge is one of our Tutors."

BS to EH, Box 4, folder 2

"Hartford March 17, 1838

Dear Sir,

I have never thanked you for your beautiful beryl handed to me in New York by a gentleman of your faculty. It is very elegant & I should think would deserve a particular notice either in the Am. Journ. or in some other work.

I have never quite forgotten your request as to the fossil bones & the marl. The latter lay frozen & buried in snow till after my return from NYork & could not be obtained & the nuisance of my public duties necessitated my attending to the former. Now for a fortnight I have been detained here by the illness of Mrs. Silliman with a severe bilious pneumonia. I came up to bring her & leave her, she having recovered from a previous attack about the middle of January but it was renewed here. She is now however hopefully out of danger & I expect to return home on Monday March 19.

⁵⁷¹ In 1836 Henry D. Rogers (1808-1866) issued the first of several annual reports on the geology of Pennsylvania. He published his *Description of the geology of the state of New Jersey* in Philadelphia in 1840.

⁵⁷² This apparently refers to Hitchcock's manuscript "Catalogue of Paintings executed in 1838 for the Government" (EOH, box 12, folder 1).

⁵⁷³ A radical group of the Democratic party, derisively named Locofocos, was formed in Manhattan in 1835. For Hitchcock's presumptive monopoly, see his letters of Jan. 9 and April 9, 1838.

⁵⁷⁴ Clinton Hall was at 13 Astor Place. It was named for Dewitt Clinton (1769-1828), mayor of New York, subsequently governor.

Not knowing but you may have got beyond the marl & the bones in your report, I write to know whether they would still be useful to you. If so they shall be forwarded on my return.

I remain my dear sir as ever truly yours,

B Silliman

Prof. Hitchcock”

EH to BS, Box 5, folder 18

“Amherst April 9th 1838

Dear Sir,

I received your last letter just as I was starting for Boston to print my Report on our Geology⁵⁷⁵ & have but recently returned. Your kind offer about sending the Jersey marl & the fossil bones was too late for my report: but I should be much obliged to you for them. For my report embraces only certain points of our economical geology & does not touch the fossil footmarks & I hope if I live to embody all that I have published in a more mature & full report. I begin to doubt after reading Prof. Rogers’ Report on the geology of N. Jersey⁵⁷⁶ whether any other marl than the green sand had been brought to New England. If you have a calcareous marl from thence I should be glad to see it. Can you also let me have a little of that marl from Farmington which I presume corresponds with the Berzelius marls.

My Report is out in Boston I learn but I have not yet received any copies. As soon as I do you will have one. You will see a want of maturity in it but I think you will find some evidence of hard work. I have brought out in it a new & what appears to me an important method of analyzing soils by Dr. S. L. Dana of Lowell.⁵⁷⁷ I expect you will be flooded by geological reports this year as I see they are being poured out in every quarter of the Union.

Would you like to received a short communication on the subject of Mount Ararat in Armenia consisting chiefly of extracts from letters of Rev. Justin Perkins, missionary in Persia, who has passed the mountain five times & a sketch of it by Mrs. Perkins? Unless you should like to insert the drawing I doubt whether the letters would be important enough to print separately. The communication would not occupy more than two or three pages.

In a letter to Prof. Henry D. Rogers lately .I have suggested the importance of having a meeting of geologists this spring or next summer in N. York or Philadelphia in order that they may become acquainted with one another & aid one another in difficult cases. I think such a meeting would produce more of mutual interest & fellow feeling than now exist: and it would greatly aid those especially who are engaged in state surveys.⁵⁷⁸ I think too the meeting might be made popular if some discussion & lectures might be held in public. I have told Mr. Rogers that I hope he in connection with other geologists in Philadelphia & N. York would forthwith issue a Circular inviting such a meeting. How does it strike you & would you attend?

What has become of your excursion to the iron mountain of Missouri? I suspect the difficulty is that Mr. Van Doren is more successful in finding iron than gold.

I have tried to monopolize the beryl locality in Royalston for a few months: but know not yet whether I have succeeded. I hope to give some account of it in due time. It affords some rather curious modifications of crystals & a distinct crystal of feldspar from that place now lies before me 10 inches in breadth!

I heard your letter read in Boston respecting Mr. Mantell’s cabinet. The gentleman was present who has the management of the Lowellian legacy & said some favorable things: But I could not judge whether any effort could be made in Boston in relation to it.

I hope Mrs. Silliman has recovered from her severe attack & that she may live many years to bless you & society.

Sincerely yours,

E. Hitchcock”

BS to EH, Box 4, folder 2

⁵⁷⁵ Hitchcock, *Report on a re-examination of the economical geology of Massachusetts* (Boston 1838).

⁵⁷⁶ In 1838 Rogers published his third annual report, included in his final report on the geology of New Jersey in 1840.

⁵⁷⁷ Samuel L. Dana (1795-1868) published widely on Massachusetts mineralogy, geology, and soils.

⁵⁷⁸ The Association of American Geologists was established at a meeting in Philadelphia in early April, 1840; Hitchcock was named its chair. He was not the first to propose such an association: see Silliman’s letter of April 14, 1838.

“New Haven April 14, 1838

My dear sir,

I am within a few hours to set out for Hanover with a good female friend on account of the critical sickness (& impending danger from another expected event) of my daughter Mrs. Hubbard. I cannot call upon you in going up & it impossible [sic] to say how it may be in returning. I shall do it if possible. In the mean time my son is commissioned to pack the bones &c for you, some of the marl of the south & of Farmington if we can find it, but it is only a trifle we have & you had better write to Gen'l Cowles Farmington to find you a box by the canal which will leave very soon, directed to some friend in Northampton. It is a most beautiful shell marl & in great quantity.

I must write you more at leisure as to the meeting. Rogers addressed me two years ago on the subject & Jackson at great length last week with a plan of a constitution for a general society &c.⁵⁷⁹

Mr. J. P. Davis has written me about the Mantellian Museum. It would [sic] a great honor & advantage to this country & a gem in the crown of Massa. I hope it may yet be accomplished.

Expecting the stage you must excuse my driving haste & my hieroglyphics worse to decipher than your bird tracks to the final revision of which I look with all good will & interest.

In great haste, yours as ever

B Silliman

Prof. Hitchcock”

BS to EH, Box 4, folder 2

“New Haven Aug. 18, 1838

Dear sir,

It was impossible for me to reply by Dr. Humphrey as I was entirely used up at commencement. My son was ill & did not go to college so that the bones must await some future opportunity. I am glad that the bones interest you & your impression respecting them corresponded with my own.⁵⁸⁰ Their discovery will greatly confirm your views. I am sorry we cannot at present send you the Geology. I am to set out early next week with my family to visit our daughter in the west & my son wishes to read this work on his journey. We shall return (D.V.) about Sept^r 25 or 26. Will that be too late for you? Could you come to New Haven for a few days, for it is possible I may not be able to let the work go, as I have written to Dr. Mantell proposing among other alternatives that he should send out the cuts or the engravings so that we can have an American edition for his inducement & for the advantage of science here, I giving my attention & influence for his benefit & allowing the bookseller a proper reward.

I have a secret which I can only name. I have just received from Mr. Lyell a note with the 111 first sheets—264 pages—of his new work, the Elements of Geology, 1 vol, 12^{mo}, with numerous cuts, some of them new. As this is sent out for a reprint, I am not permitted to communicate it to any one except the printer & it remains to know whether the author will send over the cuts as I have proposed to him to do, & will superintend its publication for his benefit. If you were here I should however permit you to run over the sheets but not to make no [sic] public use of them until the work is out. Mr. Bakewell has also received a copy of his father's 5th edition, the only one I have heard of. There are about 80 pages of new matter particularly on coal. This copy however cannot be spared as it is to be reprinted very soon. You could however examine it if here. I have only just now received Mr. Lyell's Elements & have not had time to read them. I propose to do it on my journey which may extend to the fall & possibly to Cleveland Ohio.

I am sorry we cannot instantly second your views but hope we may do it eventually. I am not courageous enough to convoke the geologists, like the batchelor [sic] who said he admired exceedingly the courage of those who dared venture on matrimony but he was himself too timid. I am informed from my good authority that so far from coming at my call, there is a spirit in Phil^a to call the other way & that a journal is projected to supersede mine. Nous verrons!

Dr. Humphrey gave us an able & interesting discourse & gave general satisfaction.

I have just returned with my son from the examination geologically of most magnificent region of iron & coal just above Cumberland in the Allegheny mountains. We were out in the tremendous heat & it made my son almost sick since his return, but I bore it without injury. Mr. Shepard analyzed our products & the reports are gone to England. Possibly they may appear in the Journal.

In great haste I remain as every truly yours,

⁵⁷⁹ Henry D. Rogers (see above) and Charles T. Jackson (1805-1880), a tendentious polymath who was state geologist in Maine, Rhode Island, and New Hampshire in the years 1836 to 1844.

⁵⁸⁰ These bones figure in several subsequent letters, but just what they were remains a mystery.

B Silliman
Prof. Hitchcock”

EH to BS, Box 5, folder 18
“Amherst January 8th 1839

Dear Sir,

The kind concern you manifest for my health induces me to drop you this line in order to say that a kind Providence has been pleased so far to restore me that I am able to resume some duties. My difficulty was said to be a rheumatic affection of the intercostal muscles with fever of the typhoid type & both have kept me down a long while. The difficulty in my side has not entirely left me but the fever has.

I had been making a desperate effort to get ready the first part of my final Report to Government this winter & it was extreme labour that upset me.⁵⁸¹ The idea of making out that report at present has been abandoned & I merely send in a letter of explanation.

The last No. of your Journal appeared to me peculiarly interesting—at least so it appeared to me as I heard it read when too feeble to read myself.

In one of your recent letters you maintain that you expect early this year a large number of copies of Mantell’s *Wonders of Geology*.⁵⁸² Will they be for sale at the bookstores? If not I want you should reserve for me two sets. It is certainly a very interesting work. It contains indeed some strange blunders (which you have noted with your pencil in the margin) but they are such mistakes as a man very much occupied with professional business would be likely to make & therefore more excusable. I shall venture to keep your copy at present as I hope to be able to proceed with my abstract of geology for my Report & I can hardly do without this work.

I send herewith a letter & pamphlets from Rev. W. B. Clarke of Stanley Green, England.⁵⁸³ The Christian Remembrances (8 Nos.) he allows me to keep after you have done with them. He sent me quite a good though rather promiscuous collection of English rocks.

With respect to Mrs. S. & your son, I remain truly & sincerely yours,
Edward Hitchcock”

BS to EH, Box 4, folder 2
“New Haven Mar. 7, 1839

My dear sir,

I was much gratified to hear from your own pen that you had recovered in a good degree from a dangerous & painful illness induced by excessive labor which I hope you will not again encounter. I well know however how difficult it is for us to keep within the boundaries of safety & comfort. I ought before this to have answered your enquiry respecting Dr. Mantell’s work. A new edition is now I suppose nearly thro’ the English press. It went to press Jan. 1 & 500 copies are to be struck off & sent out to a M. Maltby as an American Edition, the first from the second London with a short introductory discourse by himself to Americanize the work. This I trust will be here early in May & you can have any number of copies you choose by applying early to A. B. Maltby who is the proprietor of the American copies which will be identical with the English in all respects. Dr. Mantell has had my remarks, & says he shall avail himself of nearly all of them. He may differ from me in opinion on some points. The work will have some 60 or 70 new illustrations in wood cuts & several lithographs in addition.

I suppose the price of the American copies will not be much more than half that of the work at home.

Bakewell is out with my appendix revised.⁵⁸⁴ You will observe that I have now gone for the whole & have spoken out in full terms of certain things.

I will send you the appendix if I have an opportunity & remain as every most truly yours,

B Silliman

I thank you for your interesting analysis of the Farmington marl which I will publish unless you forbid.⁵⁸⁵

Prof. Hitchcock

I suppose the price of Mantell’s new work & of Bakewell will not exceed \$3.50. I am not interested in the editions.

⁵⁸¹ Hitchcock yet had two years of work before finishing his *Final Report* (Hitchcock 1841).

⁵⁸² Mantell 1839 (orig. 1838).

⁵⁸³ William Branwhite Clarke (1798-1878), British theologian and geologist, student of Adam Sedgwick, moved to Australia in 1839, and is regarded as the “father” of Australian geology.

⁵⁸⁴ Bakewell 1939.

⁵⁸⁵ Hitchcock, “Analysis of marl from Farmington, Conn.,” *AJS* 36, 1 (July 1839): 176.

I have written to Mr. Clark & will return his magazines to you.”

EH to BS, Box 5, folder 18

“Amherst July 20th 1839

Dear Sir,

I have nothing special to say except to acknowledge the receipt of your letter of last March & to thank you for it. I succeeded last winter after sending twice to N. York & twice to Boston & finally paying \$5.00 in getting a copy of Mantell's Geology & this summer Wily & Putnam have sent me another copy so that I am fully supplied. Your new edition of Bakewell I have not yet read. I perceive it is got out in fine style.

A thought just occurs to me. Why can you not send by Mr. Shepard those fossil bones which you lent me that he may show them to Mr. [Richard] Owen of London? I am exceedingly anxious to have him see them: and as no others are known, he will not think it strange that you do not present them to him. Perhaps they would enable him to [de]cide whether they are the bones of birds.

I am still constantly occupied with my geological survey either in the field or the laboratory or the study. I am almost worn out with it & constantly long to have it finished.

I recently sent a set of plaster casts & moulds to Prof. Ax. Brongniart for the Garden of Plants as you requested a year or two ago.

Gov. Everett intimated to me that there was some prospect you might become a citizen of Massachusetts. But I perceive that it is only during the delivery of a course of lectures.

Respectfully & sincerely yours,

E. Hitchcock”

EH to BS, box 5, folder 18

[no heading] July 22d [1839]

Dear Sir,

I have sent to Prof. Shepard a specimen of the impression of the drops of rain on the sandstone of the Connecticut Valley requesting him to take it to England to compare with similar impressions found there as I presume you recollect. I have had the specimen in my hands for you but did not venture to name them till I saw the account by Mr. Cunningham of those in the Storeton quarries near Liverpool. Perhaps you would like to see the specimen. I do not say that I have no doubt but I do say that the characters are very striking.

I had an opportunity lately to recommend Prof. [O. P.] Hubbard for a Geological Survey of N. Hampshire having been asked by the Governor to name some one. I trust he will receive the appointment. I see also that the act has been modified agreeable to my suggestions so that the geologist can appoint his assistant.

I have lately been reckoning up the geological surveys that have been undertaken by the governments of this country & find them to amount to nineteen!

Yours &c,

E. Hitchcock”

BS to EH, Box 4, folder 2

“Boston January 8, 1840

My dear sir,

I am indebted to you for a letter received just before Mr. Shepard sailed for England. It was almost in the moment of his departure & we were unable to find & arrange the bones in season which I very much regretted.

You may have heard that I am again here on geology, the opening course of the new Lowell Institute. Within 8 or 10 days I shall come to the upper red sandstone & must say something of the tracks. As I am not sure as to your present impressions on that subject, I wish you would drop me a line to arrive here within a week that I may quote you correctly. Do you still adhere to the views expressed in the Journal or did you find reason to admit among the birds, or to their exclusion, marsupials, saurians, &c?

As I am addressing four times a week 3000 proper in two divisions of 1500 each (the lecture repeated), it is of the more importance that I do you & the subject justice.

My son who is with me unites in kind regards,

with your # & #,

B Silliman

Prof. Hitchcock

Do you find any more rain drops?⁵⁸⁶

EH to BS, Box 5, folder 18
"Amherst January 12th 1840

Dear Sir,

I thank you for still continuing to take so much interest in the fossil footmarks and am glad to give you the present state of my impressions reflecting them.

I have not found time during the last year to make particular examinations at the localities. But in examining my specimens & reflecting on the subject, I have found nothing to change my general views as given in your Journal. In preparing an account of them for my Report to the Government, I intend to arrange all fossil footmarks under the term *Ichtnolites* or *Stony tracks* and embrace those in N. England under two divisions, viz. *Ornithoidichnolites* (or *Ornithoidichnites*), that is, fossil tracks resembling those of birds: and *Sauroidichnolites* (or *Sauroidichnites*) or tracks resembling those of saurians. These names are too long: but they would be safer than those I have used. I have little or no evidence that any of these tracks are those of quadrupeds: and my impression is that the *Sauroidichnites* were made by birds of a sauroid type of which almost all animals seem to have partaken in sandstone days.

[At right angles in adjacent margin, without mark to indicate its place in the narrative, this one sentence:]

I am disposed to think that the trail behind some of the tracks which I have supposed made by a hairy appendage was produced by the skin of a heel which did not sink quite so low as the toes.]

[The text then continues directly from "partaken in sandstone days."]

I have fine oil paintings of all the species of these tracks of the natural size & I intend to have them lithographed in my Report of the same size. I have also similar drawings of numerous slabs where tracks are shown in succession. Should you think proper to allude to this fact in your intercourse with our political leaders & express the opinion to them that such lithographs would be very desirable, it might confer a favour upon me: for in these catching times as to who shall be # I find politicians afraid to incur much expence for such objects. I regret that I did not leave these paintings at Boston when I had them two or three weeks ago that you might see them & use them if you wished. I do not intend sending them to the lithographer till I get my report on the subject written. By the way, Messrs. Adams & Butler of this place & Northampton will have the control of the lithographs for the whole of my report & should you wish any of them for your Journal, I presume you could have them for little more than the cost of paper & press work. There is the subject of tracks & that of diluvium & that of concretions that might make separate papers adapted to your Journal if you should wish. But it will be considerable time before they will be ready. My Report will be an entirely new one mostly rewritten. I am & long have been at work upon it to the extent of my strength: but it is a great job. The analysis that I shall give (which will amount to 400) have cost me the most labour. To get these 400 I have had to go through with at least 1000 & perhaps 1200 within the last two or three years. And after all I ought to have been able to make the repetitions far more numerous.

While on the subject it may interest you to say that I have just finished analysis of a petrification which I found upon our sandstone (I believe at Wethersfield) which has the appearance either of worms or of the coprolites of birds. I hoped to decide this point by the analysis. 100 parts contain

Silica	40.35
Peroxide of iron.....	8.48
Alumina.....	1.54
Subphosphate of Alumina.....	37.00
Phosphate of Lime.....	3.62
Lime.....	3.32
Water.....	2.85
Loess [?].....	2.34
	100.00

By another process I supposed I got a trace of cizic acid [?] which if I was certain of would decide I think that the substance is the coprolite of a carnivorous bird, but I do not feel confident on the point. The above analysis shows I think that it must have been animal matter that was petrified. Perhaps we can infer nothing more.

⁵⁸⁶ Hitchcock's correct deduction that some stony impressions denoted raindrops was at first much disputed. In early 1839, Silliman got Charles Shepard to take to England a specimen of the raindrop stones to compare with similar impressions recently found in a quarry in Storeton: AJS 37, 1 (Oct. 1839): 371.

Prof. Shepard says that my specimen of supposed raindrops does not correspond to those in England which he saw: but he does not say how they differ. I have supposed therefore that I must give it up. But since the receipt of your letter I have tried an experiment with soft mud by sprinkling water upon it & the impressions made are almost exactly like those upon the slate. The only thing which I could not imitate was an appearance upon the stone as if a strong wind had made the drops strike very obliquely upon the mud. I had noticed this fact upon my specimen before I had seen a similar statement in respect to some of those in England. In short, in spite of what Prof. S. says, my decided conviction is that these are the veritable impressions of rain drops. I can think of nothing else that could produce them unless it were the dropping of some sorts of seeds, but this is far less probable. I wish you could see a specimen & also my experiment.

I see by your last Journal just received that they have at last found trifold fossil footmarks in England which are probably like ours. I think that if they do not stop making discoveries in Europe of this sort, Mr. [Timothy] Conrad & the many others (for I find they are many) who will not allow that there are any tracks in this valley must either conclude that European geologists are as stupid as I am or acknowledge that there are real tracks here. However I do not expect to convince those who doubt on this subject: for it wants something more than facts to overcome prejudice and I am satisfied that this is a principal source of the difficulty.

I will not wish you much success in your lectures, for that you already have, but express the hope that you may do much to promote a taste for the noble science of geology. Have you seen Dr. Pye-Smith's recent lecture on the connection of this science with revelation?⁵⁸⁷ I have not but have a suspicion that he has taken the right ground. Mr. Redfield of N. York has it.

Respectfully yours, E. Hitchcock

My best respects to your son.

P.S. The use of tobacco is coming in upon our college like a flood (a very filthy one) and some who use it appealed to the example of some of the Officers of Yale College. I knew it could not be you: and I wish I could contradict it in respect to your colleagues, for whatever is done at Yale is considered as lawful here."

EH to BS, Box 5, folder 18

"Amherst April 26th 1840

Dear Sir,

I suppose that ere this you will have received from Prof. Beck some account of the meeting of the geologists at Philadelphia the first of the present month.⁵⁸⁸ I meant to have called upon you on my way, but could not when going on, & on my return I met with an accident that so disfigured my face that I did not like to show myself. I did not expect to see you at Philadelphia as I knew that the invitation (which was given by the N. York State Geologists) was confined to those who are engaged in the state surveys. But the business is so arranged now that I trust we may hope to have you to preside over us at the next meeting. The vote electing you was unanimous. By the way, I understand that it is expected that the Chairman will make a short speech at the close of the meeting & a longer one on organizing the meeting the following year. We had a very pleasant & to me a most profitable meeting. We kept it up for three days. A committee of five (Vanuxem & Conrad— sceptical— Prof. Rogers & Emmons—convinced—& R. C. Taylor—neutral) to come on & examine the fossil footprints & report next year.⁵⁸⁹ I shall be very happy to show them all I can. By the way, the description of the new locality of tracks published in your last No. of the Journal of Science brought to mind at once a specimen I have from that remarkable locality at Wethersfield & in examination I can hardly doubt but it is the same thing as the German Doctor describes, and yet it seems difficult to imagine what sort of animal it could have been that made the impression. I have sometimes suspected that my specimen might have been produced by the pendulus of a Saurian, but I have never ventured to say so. I want to see more specimens. Please not to mention my suggestions on this point in the Journal.

⁵⁸⁷ Pye-Smith 1839. Pye-Smith taught divinity at the Protestant Dissenting College of Homerton, England. His book defends Genesis by elaborate and detailed references to contemporary geology and to Hebrew philology.

⁵⁸⁸ Lewis C. Beck (1798-1853), botanist and geologist, from 1830 professor of chemistry and physics (natural philosophy) at Rutgers, and one of the founders of the Association of American Geologists.

⁵⁸⁹ Lardner Vanuxem (1792-1848), geologist who worked widely in the eastern U.S.; Timothy A. Conrad (1803-1877), geologist and conchologist, published "Fossil shells of the tertiary formations of the United States" in fascicules beginning in 1832; Henry D. Rogers (see above); Ebenezer Emmons (1799-1863) of Williams College, pioneer geologist of palaeozoic stratigraphy, "father of the Taconic System," attached to the New York geological survey in 1836; Richard C. Taylor (1789-1851), geologist of Pennsylvania's coal fields. Their favorable report on Hitchcock's footmarks was published: *AJS* 41, 1 (Oct. 1841): 165-68.

I thank you for forwarding the pamphlets of Mr. Clarke & Prof. Daubeny. I have read them with great interest. I suppose you have seen Dr. J. Pye-Smith's book. What will our theologians & commentators say to his views? I believe he has hitherto stood high as a theologian & a philologist. But he out-Herods Herod in his book.⁵⁹⁰ I understand that somebody in N. York is coming out furiously upon you & me. He is writing a book. I forget his name.

I do not recollect whether I have ever enquired of you whether you own the third edition of De la Beche's Geological Manual. I have repeatedly ransacked our principal cities & have twice sent to England for it & strange to tell I cannot find a copy in this country or in Europe. I want it very much at this moment for a few weeks to make out a synopsis of organic remains for a summary of geology which I am preparing for my Report & also for a text book.⁵⁹¹ Should you happen to have it & would spare it to me for a few days I should esteem it a great favour. If you have not got it do not trouble yourself to reply to my letter.

Sincerely & respectfully yours,
Edward Hitchcock"

BS to EH, Box 4, folder 2
"New Haven April 29, 1840

Dear sir,

Mr. De la Beche sent me a copy of his third edition which I have packed & sent out to seek a conveyance to you by someone going from college to your vicinity. The back is broken & it will need some attention not to have the book come to pieces. Please return it when you have done with it.

I was I confess somewhat surprised at the movements about that Geological meeting, not knowing the ground taken, but it had been explained by a letter from De la Beche before your letter arrived.

I am glad they made you chairman of the first meeting & I see no objection to performing the same duty in the second since it appears to have been the wish of the meeting. I trust we shall meet before that time & I should wish to ask you some questions.

My next year's engagement in Boston terminates April 1 or 2 & it may not be easy to reach Phil^a on the 3^d Saturday. The meeting is to be as Dr. Beck informs me on the first Monday which is the 5th. Can you inform me whether the business must commence that day & if so, at what hour & place, or whether it is merely the day for congregating & the business to begin the next day?

I am glad you are to have a committee of observation on the tracks & I trust they will be convinced.

I will be mute as to your (supposed) saurian tracks. Dr. L. Pye-Smith's book I have not seen but will obtain & read it.

I had not heard of the New York invitation. You & I know, that any attempt to impair geological evidence or to reconcile it with the popular view of time must be abortive, no matter how violent or bitter our assailant may be. Doubtless he will be more so in proportion to his ignorance of geology & to the strength of his prejudices. We can have no occasion to fear such an attack & must judge when the work appears whether it is worthy of a reply.

I remain as ever truly & respectfully yours,

B Silliman

Prof Edw. Hitchcock

It is probably that the book (De la Beche) will be put into the stage at Springfield. I therefore send my letter by the mail that you may enquire."

EH to BS, Box 5, folder 18
"Amherst August 20th 1840

Dear Sir,

I send herewith a copy of a small work on geology which I have just got out which I beg you to accept.⁵⁹² If you should find time to look it over & can conscientiously give a favorable notice of it in your journal, I shall be greatly obliged. But if it does not deserve a blessing all I can ask on the score of friendship is that you would say

⁵⁹⁰ To out-Herod Herod is to exceed in a cruel or offensive way, a very curious phrase here because Hitchcock thought highly of Pye-Smith (1.12.40, 4.26.40, and 12.12.40). Perhaps he meant only to refer to Pye-Smith's excessive annotation of Genesis.

⁵⁹¹ Hitchcock found and used the third edition of De la Beche's *Geological manual* (London 1833) in Hitchcock 1840, pp. 10 et seq.

⁵⁹² Hitchcock 1840 was given a short, favorable notice by Silliman or his son: AJS 39, 2 (1840): 391-92. It was edited to form the fourth portion of Hitchcock 1841, *Final Report*.

nothing about it. Though the work is small it has not been to me a small labour. The greatest difficulty has been to make it small where the materials were so abundant.

I am obliged to send you a copy which is badly executed especially on the first sheet which is now being struck over anew in consequence of a blunder. But I should lose the present opportunity did I wait for another copy. The execution of the book will be plain but I hope free from gross mistakes.

I thank you for your remarks concerning the fossil impressions. Truly Dr. Payne has given me an honour to which I never aspired, that of being vilified along with such men as Professors Ehrenberg & Bailey by such a man as himself: that is, by a man who knows nothing about the subject.

“By whom to be disprais’d were no small praise.”⁵⁹³

I have received several applications for catalogues of the Heidelberg Minerals in consequence of the notice given in your Journal.

In haste I remain respectfully & sincerely yours,
Edward Hitchcock”

BS to EH, Box 4, folder 2

“New Haven Aug. 31 1840

Dear sir,

Your letter accompanied by a copy of your Elementary Geol. came safely on Satry. for which you will accept my thanks. I will be anxious soon to read it.

I have for you a copy of Mr. De Buch’s fossils of Central America and one or two other minor works of the same author sent me by his distributors, and he particularly names you.⁵⁹⁴ Will you please say how it shall be sent, & when?

In haste yours truly,
B Silliman

Prof. Edward Hitchcock”

BS, Jr. and BS to EH, Box 4, folder 2

“New Haven, Dec. 7th 1840

My dear Sir,

Your kind letter of Oct. 15th by Prof. Shepard came safe to hand with its enclosure & I am surprised on seeing its date to find how long it has remained unanswered.

I have received from Prof. Shepard a box of chemicals for you, similar I presume to one which accompanied it for me. The canal is sealed for this year & also no doubt Connecticut river, & I write to enquire of you if you wish me to forward it to you by Stage & Rail Road. Very few of the tests are liable to freeze.

It is singular that Messrs. Brongniart have not paid more attention to your sendings. They have paid Pa many kind offices, and have always been punctual correspondents. If we write them we will speak of the matter.

I have never seen the moment since opening my Haddam collection in which I could lay out any specimen for my friends & do not know as I shall before spring.

You are very well aware how absorbing are the duties of a chemical Laboratory.

Mr. Vanuxem spent a day here in October & we were much gratified with his visit. He perfectly coincides with you in opinion regarding the Court Sandstone as indeed all do except Dr. Jackson & I cannot think his opinion is at all decided on the point.

The book of Mr. Morris of Baltimore concerning which Mr. Leonhard enquires must be the translation of his (L^{ds}) own work, popular lectures on Geology⁵⁹⁵ which was published in Baltimore by N. Hickman & translated by Prof. Hall & some one else whose name I cannot now remember. It may have been Mr. Morris. Only one number (about 80 pages) ever came to us & you will find it acknowledged 18 Nos. or 2 years since. We have never heard more of it. Leonhard’s book lacks perspicuous arrangement. Dr. P. Smith’s scripture geology has been most carefully read here & wd. have been noticed last No. but for pressure of other matters. Pa has received a copy of the 2^d Edition from the author & no doubt a notice will appear in the next No.

⁵⁹³ Milton, *Paradise regained*, book 3, line 56.

⁵⁹⁴ Leopold von Buch (1774-1852), *Pétrifications recueillies en Amérique par M. Alexandre de Humboldt et par M. Charles Degenhardt* (Berlin 1839).; in 1840, also translated from the German, appeared his *Essai d’une classification et d’une description des Delthris ou Spirifers et Orthis*.

⁵⁹⁵ Karl C. von Leonhard (1779-1862), *Geologie oder Naturgeschichte der Erde* (1833).

The world is full of new books & I am sure one half that is written must pass into oblivion for it cannot be read. Leibig of Geissen has published a most beautiful work, *The Chemistry of Agriculture & Physiology*.⁵⁹⁶ It is peculiarly a book of principles & worthy of its author, & although there is so much in it that one is surprised how long a time it takes to read it (for it is only about 400 pages 8^o), yet it is peculiarly a readable book.

I think that all our American gentlemen who have published opinions on this subject will find occasion to alter theirs after reading this book. It is one of the fruits of the British Association & dedicated to them & will be followed by other volumes on organic chemistry in the same series. Dr. Kane of Dublin, junior editor of Brewster & Phillips Journal, has published *Elements of Chemistry*.⁵⁹⁷ I have often heard him mentioned as one of the most promising chemists in Gt. Britain.

As we have not received any sheets of your report we presume none have been sent. We shall take pleasure in noticing it when it is out. Dr. Jackson's report on R. Island shows much labor in the Laboratory & field & in letter written to Pa says than any of his former ones [sic].⁵⁹⁸

My father will add a P.S. with respect to Mrs. Hitchcock. I am very truly & respectfully yours,

B. Silliman Jr.⁵⁹⁹

Prof. Edward Hitchcock

New Haven Dec^r 7, 1840

My dear sir,

I too am greatly in fault in not having answered your kind letter of Aug. 20 with a copy of y^r valuable work on Geology which BS Jr. acknow^d by a single page in the Journal.⁶⁰⁰ I took the work with me to the West in Sept^r to look over & altho' I failed to find time to read it intelligently, I glanced at enough to convince me of its high value & shall recommend it in my lectures. I have been looking in vain for a letter of yours in which you supposed an opinion unfavorable to certain parts of Dr. Pye-Smith's work, I presume the same that I object to altho' in the main I think it a very valuable work. I should like to have you when you write to me again say in what point you consider it objectionable as I may possibly review it if I can find time in the midst of cares & duties which as we go on in life increase in a geometrical ratio, while our days remain only an arithmetical series. Have you seen the little works of Gray (Andover) and Johnson (Wesl. Univ^y) on Chemistry?⁶⁰¹ I have not had time to read them. Christison on poisons

I find to be an admirable work but I presume you have it.⁶⁰² Dr. Mantell has sent me his *Geology of Surrey* where he now resides but it lies unread.⁶⁰³

Your good President is a great thinker.⁶⁰⁴ I see he has begun a new series of thoughts, very good as far as I have read them.

Cannot you get an accurate statement of the unhappy case of Dr. Palmer, late of Woodstock, killed by swallowing sulphuric acid, with a respectful commemoration of a valuable man? It might form an interesting item in the *Miscellanies of the Journal*.

I find in Christison several cases in which it was poured down the throats of sleeping children by their own parents of both sexes & frequently agitated in the faces of individuals by the Glasgow workers in times of excitement about wages. This seems to rival even our wickedness.

⁵⁹⁶ Justus Liebig (1803-1873), *Chemistry in its applications to agriculture and physiology*, ed. by Lyon Playfair (London 1840).

⁵⁹⁷ Robert Kane (1809-1890), *Elements of chemistry*, first American edition ed. by John W. Draper (New York 1843).

⁵⁹⁸ Jackson, *Report on the geological and agricultural survey of the state of Rhode Island . . . 1839* (Providence 1840). In 1837 Jackson had issued his first report on the geological survey of Maine.

⁵⁹⁹ Silliman's son Benjamin Jr. (1816-1885) was a chemist who subsequently became a Yale professor.

⁶⁰⁰ "Hitchcock's geology," *AJS* 39, 2 (1840): 391-92.

⁶⁰¹ John Johnson (1806-1879), *A manual of chemistry on the basis of Dr. Turner's Elements of chemistry* (several editions before 1842), and perhaps a recent edition of Samuel F. Gray (1766-1828), *The chemistry of the arts . . .* (Philadelphia 1830).

⁶⁰² Sir Robert Christison (1797-1882), pioneering Scottish toxicologist and physician, published *A treatise on poisons* (Edinburgh 1829).

⁶⁰³ A brief notice of Mantell's "A sketch of the geology of Surrey (written for and extracted from [Edward W.] Brayley's *Topographical History of Surrey*)," appeared in the *AJS* 41, 2 (Jan. 1842): 386.

⁶⁰⁴ Heman Humphrey (1779-1861), president of Amherst College from 1823 to 1845, published *Domestic education* in Amherst in 1840.

Yours as ever,
B Silliman”

EH to BS, Box 5, folder 18

“Amherst Dec. 12th 1840

Dear Sir,

I was much obliged by the joint letter of yourself & son. And I will spend a few moments in answering yours: and the increasing cases of which you speak will have me but a few moments

I do not recollect what I said about Dr. Pye-Smith’s work, but I doubt whether I expressed much dissatisfaction with it: for although I am not yet ready to adopt his notion about the limited extent of the six days’ work of creation, yet his remarks on that point I regard as very able & deserving attention. But he seems to me to be master of his subject & that is what we can say of no other theologian or philologist who has written upon it. You are aware I suppose that Dr. Smith stands very high in both those characters & so he has long been regarded by the clergy of his country. Hence his work is sought after with earnestness & read with candour by many of our clergy & I am surprised to find what a favorable impression it usually makes upon them. I think it is doing more than any and all other writers have done to bring men in this country to correct views on the subject. Hence it seems to me very desirable that geologists here should so far as they consistently can recommend his work & not seem to differ much from him. And I hope you will pass over the faults of his work as lightly as you can with a good conscience. You may think me influenced by the flattering manner in which the Doctor refers to my labours. And it may be that I am. But really I do not think we shall have so good a chance very soon again to recommend a work so well adapted to convince the religious community as this.

I have received the work of Prof. Johnston and Mr. Gray on Chemistry. The latter I have examined as I used it for a recitation book in my chemical class this fall chiefly because it was so brief. I like it very well: & have seen no errors unless it be under Crystallography. It is by no means a mere compilation but was well studied & is to a good degree original. I have scarcely examined Prof. Johnston’s work: but it struck me as I turned it over that it was almost entirely an abridgment of Turner, though I doubt not a valuable work.

I have not learned the particulars of Dr. Palmer’s melancholy case except that he died with great Christian calmness & resignation. Nor will it be in my honour to attend to the subject because I am so pressed by my everlasting Report.

I thank you for your favorable opinion of my little work on geology. I should not have written it had I not wanted an abstract of it for my Report; & now behold, I shall not find room in the space allowed to my report by the Government for a single page!⁶⁰⁵ The typographical execution is bad: but the publishers have some excuse. The fact is (inter nos) that I have tried most of the principal booksellers in our large towns from Boston to Philadelphia but none of them would publish it & the present publishers supposed the case a bad one & dared not risque much upon it. Allow me to mention another fact which is some alleviation to mortified vanity. Just as the work had got out, a respectable firm in London wrote me that if I would send them the proof sheets so that it might come out there almost as soon as here, they would grant me a remuneration. Whether they will now publish it is uncertain. I told them I thought it could not be for their interest.

I have not time now to reply to your son’s letter. But I will thank you to request him to send the package of chemicals from Mr. Shepard to Hartford by the rail road to the care of Brown & Parsons booksellers if he thinks this can be done safely. Perhaps he can upon the box request Brown & Parsons to keep it from excessive cold. If the Rail road agent will pay the expenses I doubt not they will be paid him by that firm.

The Secretary of the National Institution [Institute] for the promotion of science at Washington (Mr. Mar#) writes me that Mr. [John Roberts] Poinsett & others are quite desirous that the meeting of the geologists next spring should be held there. But I suppose I have no authority to make such a change. By the way, I will thank you to write your son to attend that meeting.

Respectfully & sincerely yours,
E. Hitchcock”

BS and BS Jr. to EH, Box 4, folder 3

“New Haven January 12th 1841

My dear sir,

⁶⁰⁵ Room was nonetheless found in Hitchcock 1841, *Final report*, for nearly 100 pages of “Elementary geology.”

I thank you for yours of Dec^r 12th. I have not yet found time to peruse Pye-Smith's new edition but I hope to do so e'er long & it is my wish that a notice of it would appear in our April No.⁶⁰⁶ I was thinking of applying to you but cannot in conscience as you are so used up & moreover you cannot so well commend one who has commended you so warmly & so justly too. So I must even try what I can do myself. I am too much delighted with the work to treat it in any other than the most respectful manner, although I consider his speculation to get rid of the difficulty of enlarging the time of the days, the most crude that I have ever seen. In adverting to this however, I shall treat him with the respect & courtesy due to a great & good man who has the courage to follow truth.

I am much surprised that the trade should have treated you no better in regard to your geology. Did you try Wiley & Putnam of New York? If not perhaps I can do something with them for you when you come to a new edition; at least should you wish it, I will try.

Yesterday Mrs. Silliman went to Hartford & I desired her to see that your box which went up in the morning cars (the PM) directed to the care of Brown & Parsons, was safely transferred to them & they requested to forward it to you. I also desired her to pay any charges that might arise. You might do well to write to them provided the box does not promptly arrive.

I should think with you that there is no reason to transfer the Phil^a meeting to Washington, certainly not without the advice & consent of the principal leaders in the undertaking. I trust your legislature will enlarge your boundaries so as to include all you may wish to say on scientific geology. You have a gov^r of enlarged & liberal mind & it would ill befit the dignity of Massachusetts to hesitate about a few hundred dollars in minding [?] so important an affair. If it w^d be of any use to you & the cause to refer any committee that might be appointed to me while in Boston. I hope to be found there from Feb^y 20 to April 2 at Mrs. J. E. Fullers, Franklin Place near the Odeon.

My son adds his kind regards & may perhaps add a line.

Yours very truly,

B Silliman [underlined with a calligraphic flourish]

Prof. Ed. Hitchcock

[Benjamin Silliman Jr.:]

Dear Sir,

I had undertaken to edit Liebig for Wiley & Putnam when (last Monday) Dr. Webster wrote me that he had long had the thing in contemplation & had abandoned the idea on learning from Little & Brown that I had applied to them to publish it & had again resumed the task on being subsequently informed that Little & B had declined & that he was now prosecuting it. I wrote him that if he had made no definite arrangement with a bookseller & had not announced publicly his Edition, that Wiley & Putnam would of course urge a prior claim. So I suppose he was [torn loss] a race of priority in publication, & he certainly has the advantage of me in knowledge & experiences.⁶⁰⁷

Mr. Colman told me you had his copy of the work & I know you cannot have read it without deep interest although he does not attach much importance to [several undecipherable proper nouns] Humus # # Extractive or whatever else you may call the organic matter of soils. I should like your opinion of what I have written in the out-coming No. in the review of Liebig & Jackson.⁶⁰⁸ I did not mention your name but only that of D. Darig for I did not wish to have even the appearance of opposition to you & to the other gentleman. We are under no very particular obligations. I see he lauds you very much for still adhering to Geine & geates in your Elements⁶⁰⁹ for I

⁶⁰⁶ Silliman, "Notice of the relation between the Holy Scriptures and some parts of geological science; by John Pye-Smith . . ." [2d ed., enlarged. London 1841], AJS 41, 2 (Jan. 1842): 387-89. Silliman regrets that Smith doesn't accept the idea of the "six days" being long eras.

⁶⁰⁷ Rival English language editions of the 1840 treatise by Liebig, *Animal chemistry or organic chemistry in its application to physiology and pathology* were published in 1842: in London (Taylor and Walton), ed. by Lyon Playfair; in New York (Wylie and Putnam), ed. by William Gregory, and in Cambridge MA (John Owen), ed. by Gregory with additional notes by John W. Webster.

⁶⁰⁸ Signed "B.S. Jr.," the review of Liebig's "Organic chemistry in its applications to agriculture and physiology," appeared in the AJS 40, 1 (April 1841): 177-82; it was followed by his "Report on the geological and agricultural survey of the state of Rhode Island in 1839" by Charles T. Jackson (Providence 1840), pp. 182-94, dated Jan. 1, 1841.

⁶⁰⁹ In Hitchcock 1840, p. 206, Hitchcock writes that "geine" is a compound of decomposed animal and plant matter; if acted upon by alkalies, it forms salts called "geates" that in soluble form are taken up by plant roots. Archaic now, "geine" is preserved in various commercial "geine technologies."

make no doubt he is the author of that review, which is very honorable to him. You will confer a particular favor on me if you can from your numerous & arduous duties find time to write me your opinion of Leibig, particularly where you think his obscurity can be cleared up & notes advantageously added. I should value your opinion very much. Will it be advisable to append a chapter on analysis of soils & the prevalent opinions of Agriculturalists & chemists in this country with a statement of the difficulty as I understand it? I think something of the sort will be expected. Dr. W. has behaved in such a childish way concerning Pa's visits to Boston & other matters that I care little for obliging him & do not see that he has any claims. I suppose he will now think that both father & son are in the lists against him. I shall add a full glossary of Leibig's terms, an analytical index & number the paragraphs in the way of Sir M. Faraday, to facilitate references. This with explanatory notes is all I intended to do.

Believe me truly & respectfully yours,

B. Silliman Jr."

BS to EH, Box 4, folder 3

"New Haven May 25, 1841

My dear sir,

Before yours of the 20th arrived I had already laid out to go by Mr. Shepard Agassiz's plates of the Glaciers⁶¹⁰ & also the plates of several other of the works of the same author, indeed the descriptions are with them & I only regret that the shortness of Mr. Shepard's stay will limit you too much in the inspection of them, but a glance will perhaps be better than nothing. I confess myself unable as yet to give an opinion worthy of your attention on the theory of Agassiz. Dr. Mantell writes me that it has a great run among their geologists but he thinks they have too eagerly jumped to a conclusion & evidently holds back. I shall study it as soon as possible but my time, my time! I have just taken up my pen again after an interruption of 5 to 6 hours by a succession of strangers, Canada geese, Phil^a, &c.

I return your proof altering only one word, reading satisfactorily for intelligently. I have delivered your message to Benjamin. I am glad that Mr. Lyell stands acquitted of infidelity. You may remember I did not judge him quite so unfavorably as you did.

I thank you for your too favorable opinion of my mode of lecturing on geology. I can only claim an honest endeavor to be intelligible & to enforce on others my own conviction.

It is perhaps possible that the more elevated sphere in which the great English Geologist has been accustomed to move may make him less intelligible to the many over whose heads instead of into them he may fire, but we shall see. I have written him a very long letter in answer to his enquiries & enclosed it to the care of Mr. Lowell from whom I have never heard a word about this invitation either before or since it was given.

Within a few days I have a very kind letter from Mr. [Roderick] Murchison from Paris on his way to the Ural mountains. He says that it is his warmest wish to visit the U States but that he cannot come before 1843 when he promises himself to visit us. I think Mr. Lyell may be with us in Boston in May 1842 & Murchison from where else [sic] in 1843.

I remain as ever yours most truly,

B Silliman

Dr. J. P. Smith has given you a warm eulogium, deserved I have no doubt & it will do you great service."

BS to EH, Box 4, folder 3

"New Haven June 15, 1841

Dear sir,

I received the books ret. by Prof. S^d & I am glad they were acceptable to you. Your MS is in press & you will receive a copy very soon.⁶¹¹ I now send you a copy of a paper just received from Mr. Murchison, some parts of which have a strong bearing upon your discussion of boulders. I annex also an extract from a recent letter from Dr. Mantell by which you will perceive his views on Agassiz's theory. I think as far as I understand it that we cannot go—per sultem—for the whole of it. 'You will have seen that Agassiz's "Etudes des Glaciers" set all our geologists hunting after moraines, and Lyell, Buckland and others instantly found proofs of former glaciers and of a cap of ice over the whole northern hemisphere, from the boulders & scratches on the rocks & beds of gravel & mud which erst were considered proofs of diluvial action. As a consequence several memoirs on the former existence of glaciers in England & Scotland were read at the Geological Society & gave rise to many animated

⁶¹⁰ Agassiz 1840.

⁶¹¹ Hitchcock 1841, "First Anniversary address."

discussions. This is now over, and [Richard] Owen's foot marks & labyrinthine tracks are on the ascendant.⁶¹² But with all the rash enthusiasm & overweening desire to adopt any theory that has the charm of novelty and strangeness, we are steadily advancing in knowledge. Although Agassiz's theory to the extent he carries it cannot be admitted by any rational geologist yet modified it explains many hitherto obscure phenomena.'

I shall take the liberty to look over your proofs (with BS Jr) & you will receive copies with our little corrections. If any of them should be wrong you will of course put them right.

Your designation as chairman should be retained. You were of course welcome to copy any of Agassiz's drawings & I only wish you had had more time.

In haste as ever yours very truly

B Silliman

Prof. Edward Hitchcock

Murchison you can return when convenient."

BS and BS Jr. to EH, Box 4, folder 3

"New Haven June 28, 1841

Dear sir,

Would you like to have your address published in the October No. of the Journal? The thought has occurred to me but we are not yet quite certain that we can do it consistently with existing engagements & liabilities.

I am not quite sure that the association who are to bear the expence of the publication would not regard it as an anticipation of their rights, but on the other hand it would tend to increase the celebrity of their doings.

Let me have your thoughts by return of mail as the types are standing.

Your proofs have all been received. I have read Pye-Smith's revised book & like it entirely & warmly except his breaking up of a portion of the earth on purpose to reconstruct it in six days which I do not believe & I think I have disposed of that hypothesis in my last revised sketch of this subject.

Yours as ever,

B Silliman

Prof. Ed. Hitchcock

I observe he makes the amends honourable to Lyell. You know I thought you were hard on him in placing him with Dr. Cooper &c.

My dear Sir,

As our Oct. No. is already begun and we have matter engaged for about 100 pages, would you object to the abridgment of y^r address? Would you not undertake yourself to make a copy in those parts which can best be spared, if indeed any such parts exist, which I much doubt.

The price of original matters on us such as it is, is too great to admit of frequent long articles, but we ardently desire to make this an exception.

I have placed the list of officers at the April meetings just before the members, and the officers for the meeting in Boston after, for it was obvious that ipso facto the officers of this year are in power until resignation or expulsion, as those for Boston cannot be considered inducted until the time appropriated for the meeting. Indeed the address of the chairman at the opening of the meeting in the Geology & Royal Soc. is considered his resignation and is always given I believe on the accession of the new officers.

Am I right?

Yours truly,

BS Jr.

Prof. Hitchcock"

EH to BS, Box 5, folder 18

"Amherst Sept. 16th 1841

Dear Sir,

I received from your son 35 copies of my Address some time ago for which I shall forward the price in this letter if I can send it by a private opportunity: otherwise I shall do it as soon as such a mode of remittance occurs.

⁶¹² Richard Owen (1804-1872) was already prominent in paleontology, and was recently in the news for his study of fossils that Darwin had brought back from his famous voyage: "Fossil mammalia," in *The zoology of the voyage of H.M.S. Beagle*, ed. Charles Darwin, vol. 1 (London 1839).

He will greatly oblige me by sending me twelve more copies. It will answer if they come with the October No. of the American Journal of Science: or they may be sent to Mr. Butler's care in Northampton. I am obliged to your son also for a copy of the Address bound with the Proceedings of the Association.

I forwarded to you some days ago a copy of my Final Report with a copy of the second edition of the Elementary Geology from the publishers. I hope the packet has reached you in this time.

Dr. Deane of Greenfield has sent me specimens of fossil footmarks which satisfy me that one of the species which I have described in my Report (the *Ornithichnites tuberosus*) embraces at least two species. He suggests that your name should be attached to one of them. I shall say to him in reply that nothing would give me greater pleasure than to do this provided it will not be unpleasant to you. But I shall state to him that when I was naming the other species, I put your name upon one of them: but in talking with a judicious friend we rather concluded that you would hardly consider yourself honoured by having your name put upon a bird track after it had been put upon the rolls of most of the learned societies of Europe & America & so I struck it off & put on that of a younger man. If I reasoned incorrectly, I shall be quite glad to restore it: though at present I have no idea of publishing any thing more on this subject.

In haste I remain respectfully & sincerely yours,
Edward Hitchcock"

BS and BS Jr. to EH, Box 4, folder 3

"New Haven September 23, 1841

My dear sir,

Agreeably to the request contained in your favor of the 16th, my son has packed the additional copies of your address. We think that you should not pay for them & trust the association will agree to do so & I trust they will propose so liberally as to save BS Jr. from losing by his zeal for science.

I thank you in advance for the copy of your final report—not yet arrived—but it will come no doubt in good time & I will then send you a newspaper with the letter P upon it, unless we should have occasion to write to you.

Mr. Lyell spoke very highly of your last report & left his copy here in safe-keeping until he returns from New York State where he has been for some weeks & was about a week since at Conackie a little above the Catskills. He will visit you & will be most anxious to see the tracks.⁶¹³ His lectures begin in Boston Octob. 19 & end about Dec. 31, but whether he will visit you before his lectures begin or after his return from the S^o next spring I cannot say. He & his lady were with us 3 nights & in our house & we found them most interesting people.

Dr. Deane has recently sent me a very fine impress of tripartite tracks, two in one stone, & shewed me others at Greenfield & promises to send me more. Dr. Mantell is very anxious to obtain some specimens & I have written to Dr. Deane & he promises to obtain them. If you can forward the thing I know you will. I am anxious to convince Dr. Mantell who I think has been rather shy on this subject having found in England no remains of birds lower than the bottom of the Wealden. I wish to have him come out in his next edition with a full admission of the fact, but it would be most desirable that we should find some bones of these birds & reptiles too if such there were. I thank you & Dr. Deane for thinking of me in connexion with this subject but am quite satisfied that you preferred the young man, for my long name tacked on to those long toes would indeed drag its slow length along.

I leave a little room for my son who may wish to add something. I ought not to close without saying that Dr. Mantell has sent me a pen drawing of the restored Chirotherium, now called Labyrinthodon, & also of his tooth & a magnified view of its cross section, also a drawing of the Pterichthys, a fish of the old red sandstone and finally a sketch of part of the jaw of a new reptilian jaw from the Ural mountains called Phopalodon Mantelle by a Russian. I suppose these things will appear in Mr. Lyell's Elements of which a new edition is now reprinting in Boston.

Yours most truly
B Silliman

Please thank your publisher for the copy of your 2^d edition, not yet received.

My dear Sir,

I owe an apology to you & father for having so long detained his letter, but the detail of opening a new number of the journal with the countless letters & bills & &c must be my excuse.

⁶¹³ Lyell and his wife spent two days with the Hitchcocks in April, 1842. Lyell visited the Connecticut river footmarks with Hitchcock, and examined those in his collection.

Your final Report has a few lines in our Oct. No.⁶¹⁴ but not nearly so much as we intend. Who [do] you intend to have review it or rather, have you a preference? Dr. Jackson is surprised you should adopt the ice theory from the phenomena of N. England wh. to his mind present no effects ascribable to Ice. Prof. Forchhammer finds no evidence in support of Agassiz views in Denmark. We expect soon to describe his report on the Geology of Denmark.⁶¹⁵

Jackson's new mineral Chlorophyllite is called up for judicial examination by Judge [C. U.] Shepard & found guilty of # titles holding all false colors you will see in the Oct. No. We send off our English copies of the new No. tonight & you will receive yours early in the week. We never had so great a press of good matter since my knowledge of the Journal, & are obliged to disappoint many contributors. But we have the advantage of a greater selection & the Journal as a consequence ought to be better.

I believe you have not yet seen Mr. Lyell. He made a most favorable impression here, indeed thus far everywhere he has been. Will you not go down to Boston to meet him? Father goes there on the 19th Oct. to hear his opening Lecture on the evening of that day. He has brought out some gigantic illustrations & is employing [Robert Jr] Bakewell in making more.

You have heard of the resignation from the Med School of our Dr. Tulley. [sic] It is not on the whole a source of much regret.

Very truly # #,

B Silliman Jr.

Sept. 29, 1841"

BS and BS Jr. to EH, box 4, folder 3

"New Haven Aug. 9th 1842

My dear sir,

Important engagements have prevented me from replying to your letter of July 5. I might seem like parading [?] to tell of particulars. You well know how college men are riled up, but one thing I will mention. I have been compelled to write an address to our alumni, because gentlemen here & there had failed. It is chiefly historical & statistical & therefore must be accurate. I have just this morning finished a MS. which takes 80 minutes of my slow delivery to rehearse privately & this must be regarded by my friends as my temporary equivalent for omitting many letters. But no more of that. Now to your letter. I regret that your rejoinder to Mr. Murchison was not in season for the July No. which was already closed; it shall certainly go into that for October with any remarks you may choose to make provided they arrive in season.

You will have perceived by my remarks on Murchison's address⁶¹⁶ that it did not strike me exactly as it did you. I think however that you have vindicated yourself from any misapprehension of his views, certainly from any incorrect statement.⁶¹⁷

I am persuaded that from his address — two summers in Russia and immense #ment on his return — with his duties as P. G. Soc., his reports, soirees &c, that he may have not have been [sic] to read your quartos. But this does not exempt him from mentioning the work. I read your first edition & examined your second diligently but to this hour almost, most desirous of it, I have not been able to do more than glance over the letter & parts of the third edition. I reserve it as a thing to be done, not opus opprobrium, but opus sperandum. As to the papers of the Geol. Ass. the publication, they are certainly to go on & arrangements are made but I suspect the printing is not begun. I think it will soon be in hand. A committee divided between New Haven, Phil^a & Boston is not very manageable. My son who is one of the comm^e is now in N. York for 3 or 4 days but on his return I will desire him to add a P.S. before this letter goes. We shall certainly be very happy to print your shorter piece & I do

⁶¹⁴ A short notice of Hitchcock's *Final report*: AJS 41, 2 (Jan. 1842): 384-85.

⁶¹⁵ Johan Georg Forchhammer (1794-1865), Danish mineralogist and geologist, published *Danmarks geognostiske forhold* in 1835.

⁶¹⁶ That is, Silliman's speech at the Boston meeting of the Association of American Geologists and Naturalists the preceding spring.

⁶¹⁷ Hitchcock, "Remarks upon Mr. Murchison's anniversary address before the London Geological Society; — extract of a letter from Prof. E. Hitchcock...dated July 5th, 1842," AJS 43, 2 (Oct. 1842): 396-98. Hitchcock wrote that Murchison was mistaken to believe that he endorsed Agassiz unequivocally; he accepts Agassiz's glacial theory, but it needs to be modified for America. He posits a "glacio-aqueous action" to explain "the joint action of ice and water, without deciding which has exerted the greatest influence." In the Pocumtuck Valley Memorial Association Library (Hitchcock family papers), there is a copy of a very long letter Hitchcock wrote to Murchison on Sept. 5, 1842, to explain his views of Agassiz.

not despair of the longer,⁶¹⁸ giving us time, but of course we consider nothing until the papers are first in print for the Vol. of the association. The next earliest moment for us will be when they are in proof for the association but I suppose it will be a point of honor that the Vol. be actually out first. You will correct me if I am wrong. I am gratified that Dr. [Gideon] Mantell has met your wishes & feelings. He is a man of a generous mind & has a large heart as well as a fine head. My son has not yet found leisure to make the excursions you allude to, nor do I know when he can. It will certainly give him much pleasure to call on you whenever he can.

I do not think that you & I are far apart as regards the dynamics of travelled rocks, scratches, moraines &c. I can have no doubt that we are now acquainted with the cause, a vera causa, & the details must be studied more. [no signature]

[Benjamin Silliman Jr.:]

Aug. 12 1842

My dear Sir,

The little box from Dr. M. reached us safely 2 weeks since: and we are much obliged to you for your care of it.

The Geol. Proceedings are to be published under the care of Dr. Binney & Gould [?] of Boston & we presume it is their duty to call on all authors for third papers. I shall send others by next boat, all the papers remaining unpublished in our hands. I believe a committee of one is better to work than one of 10.

The summer is running away so fast, so many labors yet remain that I fear I may not be able to come to see you. But perhaps I may & if so, shall probably be in company with my Brother, Mr. Forbes or my friend Mr. Dana of the Exploring Expedition.⁶¹⁹ We have some hopes of being able to purchase Baron Ledius's [?] American Minerals to add to our collection here, but the raising of \$30,000 to build a Library Building may so far exhaust the public as to prevent our success.

Mr. Dana before leaving the country composed the music for a little jeu d'Esprit written by one of our tutors on your bird tracks during the spring of 1837 when the Geological Lectures were in progress and the tracks were a novelty. I send you the words & have no doubt but Mr. D. will furnish the music if you care to see it. Perhaps Miss Hitchcock may play on an instrument.

'When first large birds did walk abroad
 On rocks but lately cleft
 Proceeding on no beaten road
 With toes turned right & left:
 What monstrous footsteps left they then
 Behind them as they stalked.
 Ere on this mundane Earth or men
 Or cattle yet had walk'd,
 Full eighteen feet they raised high
 Their heads into the air.
 And Lizard Possum Kangaroo
 Did wag their heads & stared.
 The little fishes were afraid
 They should be caught for food
 And out into a deeper tide
 Did swim full many a bird.
 Could but our modern eyes behold
 These birds of olden time
 Yet marching on their tidewashed way
 With strides full six feet nine.
 What trembling joy the heart # fill,

⁶¹⁸ For the "shorter," see the previous footnote. The "longer" was probably "The phenomena of drift or glacio-aqueous action in North America, between the Tertiary and alluvial periods," *Reports of the first, second, and third meetings of the American Association of Geologists and Naturalists* (Boston 1843): 164-221.

⁶¹⁹ Forbes was his brother-in-law. James Dwight Dana (1813-1896), who will appear often in these letters, was geologist on the U.S. Exploring Expedition in the Pacific, 1837-1841. He married Silliman's daughter Henrietta in 1844; in 1846 he became joint editor of the *AJS*, and in 1850 was named Silliman's successor as professor of natural history and geology.

What gladsome tears the eyes!
 Geologists could not sit still.
 They'd throw their caps on high.
 Let them each one that looks upon
 The tracks of such a bird
 Impressed on sand now turned to stone
 As cheese is made from curd,
 Reflect if fowls were larger then
 Than fowls that now appear
 Which more their year must # have been
 Far longer than our year.
 Chorus:
 And Birds like those great birds of Old
 One half the story's not yet told
 About those giant Birds of Old.'

As this was an extempore at dinner table, quite an impromptu, it is pretty good, & the music is much better. Mr. Dana felt some delicacy in my sending the above to you lest you might think it disrespectful of a stranger to have done so.

With much respect
 Your friend
 B. Silliman Jr."

BS to EH, box 4, folder 3
 "New Haven Aug^t 31, 1842
 My dear sir,

I have not the smallest knowledge of the views of the committee.⁶²⁰ My son says that there has been no consultation or understanding as regards the publication nor did I hear of any power given to the committee to omit any communications. I think it very unfortunate to omit your view of Asiatic Geology. Such papers are frequently admitted into the Geol. Presentations of London although if there is to be a preference, perhaps papers relating to our own geology ought to have the prior claim. It would be very little to our credit & still less to our advantage to have all your papers withdrawn, especially with wounded feelings. Benjamin thinks that H.D.R. [Henry D. Rogers] has taken it upon himself to decide without consultation, perhaps influenced by the flight of time & the difficulty of communicating. I have not the least knowledge of the religious sentiments of any of the committee except my son. I cannot however think that so narrow & unjustifiable a motive can have influenced them. I suspect that the augustories have had more to do with it than any other consideration. Pray look over your MS on Asia & compute its extent in pages of the Journal at 2230 letters to a page. B. thinks we are already more than full for January but will consider what we might do afterwards, but reserving the decision until we know our positions. But George Jones has recently found as I understand some very good bird tracks at Wethersfield but I have not learned of what species.

I have communicated your letter & this to my son to which he has no additions to make.

Let us hear from you again soon.

We have every disposition to aid in bringing out your production being fully sensible of both their & your deserts. We are however bound over to circumspection, as, for a year past particularly, our Journal expenses have been increasing & our subscription diminishing, with considerable losses by failures.

Sed meliora speramus
 Johanne primo deleteo &
 Henrico primo instituto sine veto.
 As ever truly yours,
 B Silliman

⁶²⁰ This concerns the third annual meeting of the Association of American Geologists and Naturalists held the previous April in Boston. Hitchcock (in letters now missing) was miffed that one of his four papers was not to be published with the meeting's proceedings. For that meeting, see "Third annual meeting of the Association of American Geologists and Naturalists," *AJS* 43 (Oct. 1842): 146-84. The Sillimans did not publish Hitchcock's paper on Asian geology.

Prof. Hitchcock”

BS to EH, box 4, folder 3
 “New Haven Sept^r 13, 1843
 My dear Sir,

Your communication is received but is too late for the October No. I expect to go for Hanover on monday next & wish you would if practicable let me see you a moment at the hotel where I suppose we dine. I will then arrange with you for a little more time on my return in the ensuing week. I shall expect to leave Hanover on monday Sept^r 25th & to be in Amherst the next day, tuesday. I will remain until wednesday or even till thursday* if necessary as I wish to see you & your collection, especially of tracks, & if any place is within reach where I can see them in situ I shall be glad to be directed to it or to go with you if your duties will permit.

We will then confer respecting your reclamation & I shall know from you what has induced you to make an appeal, concerning the expediency of whose appearance we (my son & myself) have great doubts.⁶²¹

But I will not enter upon the subject now as I hope so soon to see you.

Dr. Deane writes to me of very extraordinary discoveries of late & I propose to stop over tuesday the 26th with him. If convenient to you to proceed with me to Greenfield I should be greatly gratified, or to drive up the next morning or to meet us at any intermediate place, if there is any one that is interesting.

I have not the smallest objection to your publication as far as I am concerned, but it strikes me as unnecessary since you are on all hands, as far as I am informed, regarded as the author & founder of the ornithichnology of the earliest bird ever & no one can deprive you of this honor. I am greatly surprised at the state of your feelings & very much regret that you did not at Boston frankly tell me how you felt & I would at once & before the association have made it all right & I cannot persuade myself that it is now essentially wrong.

As ever truly yours,
 B. Silliman

Prof. Hitchcock

* I shall hope to reach Hartford on thursday on my return.”

I will request the favor of one of your daughters to see Sarah Gridley and inform her that my daughter Julia (now at Hanover) will return with me & if agreeable will be with Miss Sarah on tuesday & wednesday the 26th & 27th. She will not be able now to stay longer as we must be in Hartford, if not on wednesday, certainly on thursday the 28th.

BS to EH, box 4, folder 3
 “Hartford, Sept^r 14, 1843
 My dear sir,

Since writing to you yesterday I have altered my plan & am now on my way to Hanover via Boston.

I tope to see you on my return & shall (DV) be with you on friday morning the 22^d instant & remain through that day & until Saturday morning. I expect to pass the preceding day at Greenfield where I should be happy to meet you if convenient, but as I understand you have been recently there; it may not be interesting to you.

I intend to send Julia on the 21st from Greenfield on thursday morning to Dr. Gridley’s at Amherst & will thank one of your young ladies to inform Miss Sarah Gridley & if convenient for her to be at the hotel to receive Julia on the arrival of the Stage from the North; it may save her from any embarrassment.

Yours very cordially (& with kind regards to Mrs. H & your daughters),
 B. Silliman

Prof. Hitchcock”

BS to EH, box 4, folder 3
 “New Haven Octob. 30, 1843
 My dear sir,

I have reflected with much pleasure upon my short but most agreeable visit at your house and have held up your family as a model of a well ordered & happy Christian domestic circle. We shall be happy to reciprocate your hospitality whenever you & your excellent lady or any of your family can visit us.

⁶²¹ Succeeding letters and the introductory essay here deal with the tangled story of James Deane’s dispute with Hitchcock.

As a new No. of the Am. Jour. is now begun, I am led to think of your reclamation, & all I intended by leaving it with you was to give you an opportunity for full reconsideration with the aid of those early letters (yours & mine) to Dr. Deane which I placed in your hands & which you can return to Dr. D. when you have done with them. My attention is just now again called to the subject by a letter of Dr. Deane received last week containing not any allusions to things that are past but informing me that he is preparing a new commⁿ (a short one) for the Journal containing a description, with lithographs, of the impressions lately discovered by him, those which you & I have seen at Greenfield. To this publication I suppose you can have no objection, & I will ask Dr. D. to send you a proof of it when set up, as I will take care to send him 2 duplicates & it may be more proper for him than for me to send you proofs before the article appears in January. We wish you to be entirely satisfied in the vindication of your claims and you shall have your own way of doing it. I am willing also to make my own amends, as it appears to me upon examining again my language in the address at Boston, that its language may not have been sufficiently guarded although it was fully my intention to do you justice & to give you distinguished honor.⁶²²

Whatever you may resolve upon, we should like to know early, that we may be sure not to disappoint you. Should you prefer an editorial explanation that shall be done & you can find it both in form & substance as you may wish it to appear & if I differ from you, you shall hear from me. To prevent any misunderstanding among fellow laborers in a common cause, I would suggest the propriety of letting Deane see a proof of whatever may print, that he may know what to expect & as a reciprocation of the courtesy which I have no doubt he will shew towards you.

If you see Mr. Adams your book publisher, please say that I did not answer his last letter because I found my son had the date before written to explain the blunder that occurred in repeatedly sending the Journal, which I regretted, as also my appearance of abruptness towards Mr. A. at the Hotel in a moment of embarrassment with conflicting demands on that moment of time.

Our Journal owing to the monied paralysis of the last six years & the failure of agents is again almost at 0 as regards support, and will soon be in serious hazard if not corrected. Perhaps we may ere long send you a letter circular on that theme which it may now be necessary to reiterate for the 3d time in a quarter of a century. We do not feel it to be an act of humiliation but of fidelity to the interests & honor of the country.

My daughter joins me in kindest remembrance to your ladies, not forgetting our estimable friends the Fowlers, Humphreys, & especially the Gridleys & emphatically Sarah who was almost a daughter in my family. I was delighted with your beautiful village & splendid scenery & most forcibly impressed by your gigantic tracks (pray put them under cover if you only have a boxed case over them) and by a grandeur in your geological specimens quite in keeping with the magnitude of those ancient birds.

I sincerely hope that your very valuable Institution will recover from its embarrassments (temporary I trust)⁶²³ and with my good wishes for both worlds I remain my dear sir, very faithfully yours,

B Silliman

Prof. Ed. Hitchcock

Please say to Prof. Shepard's friends that he & family will start for the South on Saturday Nov^r 4."

EH to BS, box 5, folder 18

"Amherst Nov. 13th 1843

Dear Sir,

I am much indebted for your kind letter of the 30th ult. which had lain unanswered longer than I meant it should be. We are much rejoiced to find that your visit here was all pleasant to yourself while we assure you it was highly so to us. I used to think I could not get through the year without coming to New Haven. But of late years I have been less punctual not from want of inclination but because I have been obliged to take my journeys most of them in the other direction and because I find myself as I grow old more inclined to stay home. The last ten years have been with me years of incessant occupation. I feel more at liberty now & if life & health continue shall hope to visit your delightful city & feel indebted to you for your invitation as do also my family.

Your messages have been delivered to those to whom they were sent & were received with high gratification.

I have had no opportunity to consult any scientific friends respecting my communication on the tracks. But I have made up my mind not to ask you to insert it. If I am able to make out a history of the subject for the

⁶²² For Silliman's comments at the Boston meeting of the Association of American Geologists and Naturalists that irritated Hitchcock, see the introductory essay.

⁶²³ Amherst College was then suffering from a steady drop in enrollments.

Geological Association perhaps you may be willing to insert that as I hope to avoid anything personal.⁶²⁴ Mr. Moody who discovered the tracks in 1802 & who wished me to correct the statements in the newspapers has taken the matter into his own hand as you may have seen by the papers so that I now feel more at liberty to withhold my communication. I would not have you make any statements on the subject on my account unless you prefer to do it. Dr. Deane showed me his drawings of the fine slabs he has in his possession. They are beautifully executed & I urged him to send them to your journal with a description as I suppose from your letter he has done. Do not trouble yourself to send me a proof of his paper as I am not anxious to see it till the Journal arrives. Dr. Dana is pushing his researches on the Coprolites. Prof. Shepard may have told you that he could not make out the phosphates in them. But I think if he were to see the details of Dr. Dana's experiments he would be satisfied that they do exist although not to be discovered by his experiment with potassium. Dr. D. is performing an incredible amount of labour upon them: but he is stimulated by the prospect of very interesting results.

I read a paper before the Geological Association at Albany giving the result of an analysis of wines from Palestine, Syria &c, & of American cider. I then supposed that society would publish its papers during the year: but as they do not, I have regretted that I did not send my paper to you. And it seemed to me that the Association can hardly expect that the members should allow their papers to lie along from year to year. Again I have indeed given an abstract of my paper in a temperance newspaper: but that is about equivalent to throwing it into the Dead Sea. It cost me a great deal of labour & as no analysis of the wines of the Levant has appeared, it strikes me that it would interest scientific men. If I thought you would insert it in the Journal I would send it on, especially as the minutes of the association contain no notice of it ever having been presented & its character is so different from all the papers presented before that body that I doubt not they would be glad to have me withdraw it. I should think it might occupy 3 or 4 pages of the Journal.

I have been recently to Chesterfield after minerals but Mr. Clark has not got any out and he is so torpid I almost despair of getting any this fall. I should probably not wait much longer before I send a box to your son to whom I wish you to present my respects. I got a supply of the red manganese from Cumington most of which is Carnelian & contains several per cent of carbonic acid, corresponding with the Rhodonite which seems to me to be a distinct species from the bisilicate. Mr. Alger is going to bring out my scapolite rock from Canaan as a new species, Canaanite!

I thank you for your kind wishes respecting our College. It may recover from its present depression: but if I rightly understand the causes of its decline, it must be many years before it revives.

My family join in affectionate salutations to yourself & daughter. We hope you may occasionally make this a resting place on your way to & from Andover.

Respectfully & sincerely yours,
E. Hitchcock"

BS to EH, box 4, folder 3

"New Haven Nov^r 16, 1843

"My dear sir,

Lecture hours impending, I write a brief note merely to thank you for your kind letter of the 13th and to say that your analysis of wines &c will be inserted if put to us soon,⁶²⁵ and when your reclamation is made before the Association at Washington we shall certainly reprint it or a condensed abstract, if it should be very long; the entire paper in all probability.

We have received Dr. Deane's paper and he concludes it by a distinct recognition of your claims.

My son will write about the minerals & my daughter joins me in kindest regards to Mrs. H. & your children.

In great haste, as ever very truly,

[signature cut out by Hitchcock for his album of autographs]

Prof. Ed. Hitchcock"

BS and Benjamin Silliman Jr. to EH, box 4, folder 3

"New Haven January 29, 1844

⁶²⁴ Hitchcock eventually published "Report on ichnolithology, or fossil footmarks, with a description of several new species, and the coprolites of birds, from the valley of the Connecticut River, and of a supposed footmark from the valley of Hudson River," *AJS* 47, 2 (Oct. 1844): 292-322.

⁶²⁵ Hitchcock, "Analysis of wines from Palestine, Syria and Asia Minor, and of specimens of American cider," *AJS* 46, 2 (July 1844): 249-57.

My dear sir,

Hearing from a person going tomorrow to Amherst, I am tempted to send Prof. Forbes' work on the Alps &c assuming you may not have seen it and knowing that it would interest you very much.⁶²⁶ It was in fact the notice of this world [sic] in the Journal for this month which caused the postponement of your valuable paper on wines. As I am expecting to leave home by Monday Feb^y 26 for Baltimore where I am engaged to give a course of geological lectures in the month of March, I must request the return of the book by that time or before as perhaps I may wish to take it with me. I suppose it will not be difficult to find some careful person going to Hartford who will see the package booked upon the books of the rail road at Hartford & there it will reach me seasonably. I need not suggest care with respect to plates &c in the use of the book. We have lately an interesting letter from Ehrenberg in which he sends his very particular regards to you. He sent us a new memoir on fossil infusorials [sic] &c with beautiful illustrations: it has gone to Bailey at West Point to be reviewed.⁶²⁷ Our kind regards to Mrs. Hitchcock & family. Perhaps Mrs. H. will like to sketch some of Forbes' five glacier scenes; if so they are certainly at her & your service.

As ever very cordially yours,

B. Silliman P.T.O.

A new letter from Dr. Mantell states that his new work on Geology is in the press. I have a kind letter from Dr. Pye Smith with a new edition of his work & a volume of sermons both for the college library.⁶²⁸

Although I missed my opportunity for the book I will send you this line as a proof of good will (not a novelty of course) and regarding the book, will remark that if you have not seen it or shall not see it before my return from Baltimore, I will then send it to you if you wish it.

I have a letter from Prof^r James Johnston Durham [sic] now in Edinb. where he has a professional duty: my old master, Dr. [Thomas] Hope, has resigned & Dr. Johnson is a candidate & what is very curious, wishes a recommendation from me. His antagonist is Dr. Brown who claims to have converted silex into carbon! as you may have seen in the Journal.⁶²⁹ The appointment rests with the Magistrates of Edinb. who do not understand chemistry but having heard that Dr. Brown has done something wonderful! are disposed to appoint him.
[Benjamin Silliman Jr.]

My dear Sir,

Prof. Ehrenberg says 'I beg you to present my best thanks & most friendly greetings to Mr. Prof. Hitchcock and the other naturalists of the Assⁿ who with you have tendered me so much kindness.' The folio sent by him is on the infusoria of N. & S. America, & his materials for the former derive almost entirely from yourself, Prof. Leibig & myself. They were sent by Dr. Say in 1837. Hitchcockii, Sillimanarum Vater und Sohn, Bailey's &c very frequently. I have a letter from Bailey; he is all afire with the book & its splendid illustrations.

Your very truly,

B. Silliman Jr."

EH to BS, box 5, folder 18

"Amherst March 11th 1844

Professor Silliman Vater und Sohn,

You will see that the communication on the previous page is dated last December which was the actual time when I went hunting birds' nests on the coast of New Holland. But the article I did not write on account of a pressure of other things till this time. I hope it may not be too late for the next No. of the Journal.⁶³⁰ If it is I doubt whether it will be best to insert it at all as I mean to attend to it at the meeting of Geologists in Washington.

⁶²⁶ James David Forbes (1809-1868), *Travels through the Alps of Savoy* . . . (Edinburgh 1843).

⁶²⁷ J. W. Bailey, "Notice of a memoir by C. G. Ehrenberg, 'On the extent and influence of microscopic life in North and South America,'" AJS 46 (July 1844): 297-313. Christian Gottfried Ehrenberg (1795-1876), *Verbreitung und Einfluss des Mikroskopischen Lebens in Sud und Nord Amerika* (Berlin, 1843).

⁶²⁸ Mantell 1844; John Pye-Smith, *On the relation between the holy scriptures and some parts of geological science* (London, 3d edition, 1844).

⁶²⁹ Clark Hare, "On the supposed conversion of carbon into silicon, as stated to the Philosophical Society of Edinburgh, by Dr. Brown," AJS 42 (April 1842): 193-95. Hare repeats Brown's experiment and disproves it.

⁶³⁰ Hitchcock, "Description by Captains Cook and Flinders of birds' nests of enormous size on the coast of New Holland, in a letter from Prof. Edward Hitchcock to the editors, dated Amherst, Mass., Dec. 22, 1843," AJS 47, 2 (Oct. 1844): 217-18. Richard Owen, replying to a query from Hitchcock, wrote him on Aug. 30, 1844 (EOH box 3, folder 30) to say that those nests were of aquatic birds and couldn't be associated with ancient creatures. He agreed with Hitchcock's "original deductions" that birds made the New England impressions, but wanted

I was much indebted for your joint letter of Jan. 29th and especially for the kind offer to send me Prof. Forbes' work on Glaciers. I have not yet seen it: but from your abstract of it in the Journal I fancy he has the right of ideas [sic] to the cause of the motion of glaciers.⁶³¹

Ehrenberg's work on the infusoria of America I had received some time ago & supposed it came through your hands.⁶³² I was astonished to find such results from the minute specimens which I transmitted. But others seem to be internal marks of correctness. What is going to be the end of this infinitesimal infinity? Would not Prichard's method work on the subject bear republication in this country leaving out a large part of the plates?

I hope you are both going to Washington to the geological meeting with saddle bags well loaded with communications. If I can muster the \$50-60 necessary and Providence permit I mean to go: but it must be very uncertain as my pecuniary resources this year are very much reduced. Prof. H. D. Rogers writes me that his attendance will be very uncertain. What does this mean? I calculated much upon his Address.

I lately had an opportunity to use one of your (Silliman Sohn) plumbago batteries & was highly pleased with it. By using it only twice however I found the zinc plates in some places nearly eaten through. I have been obliged on account of rheumatism to omit my chemical lectures this year & have purchased a Manikin as a substitute with which I am now lecturing. But should I be able to go into the laboratory next year I shall want one of your batteries.

Prof. Cooke of Troy told me that one of Prof. John Stone's generators for solid carbonic acid burst in his hands! He was not hurt, but I think I should see others have seen [?] my signs at the explosion of the 'Peacemaker.'

Respectfully & sincerely yours,
E. Hitchcock"

BS to EH, box 4, folder 3

"Hartford Aug. 2, 1844

Dear sir,

Your paper on the fossil impressions is in the compositor's hands and it will be followed by one by Dr. Deane upon the quadrupedal impression & upon his personal claims. He has sent me the only slab he had remaining, having, he says (I think two years ago), given the other to you. I have informed Dr. Deane that your paper will appear in the October No. and I have suggested to him that you should mutually exchange proofs of your respective articles; and if I receive no objection from either of you, I shall see that it is done as early as possible that, should there be occasion, there may be friendly communications between you and additional statements, if necessary, so as to close the description of personal claims in the same No. We are anxious that such unpleasant topics should not be kept alive from No. to No. As the communications will occupy considerable space, it might have been desirable to give only Dr. Deane's results without the details but I suppose you are not at liberty to dispense with them. Are not your drawings of the impressions you wish to have figured less distinct than heretofore—I suppose the artist may improve them if permitted? I return to N.Hav. tomorrow & remain in haste, as ever truly yours,

B. Silliman
Prof. Hitchcock"

BS to EH, box 4, folder 3

"New Haven Aug. 10, 1844

My dear sir,

Agreeably to the assent contained in your letter, your proofs will go to Dr. Deane & his to you.

From the pressure of long articles we find it necessary to postpone Dr. Deane's detailed analysis which will form a distinct article in the next No. while only the results will be given in the midst of your paper.

evidence of bones and of coprolites. The last sentence of his letter has an odd charm: "We must bear in mind, however, that in all the Ovipara, with the cloaca the urine blends with the excrement."

⁶³¹ Editors, "Notice of Travels in the Alps of Savoy, and other parts of the Pennine Chain, with observations on the phenomena of glaciers, by James D. Forbes . . .," *AJS* 46, 1 (1844): 172-92.

⁶³² Benjamin Silliman Jr., "Notice of a memoir by C. G. Ehrenberg, 'On the extent and influence of microscopic life in North and South America' (Vorbereitung und Einfluss des mikroskopischen Lebens in Sud und Nord Amerika" [Berlin 1843]), *AJS* 46, 2 (1844): 297-313. Christian Gottfried Ehrenberg (1795-1868) was a pioneer in the study of microorganisms in geological formations. See also J. W. Bailey, "Account of some new infusorial forms discovered in the fossil infusoria from Petersburg, VA., and Piscataway, MD," *AJS* 46, 1 (1844): 137-41

I have written to Dr. Dana [i.e., Deane] to inform him of this arrangement & that proofs of your article would be sent to him that he might see that the results were correctly given. He has been informed also that his analysis, in extenso, would be very soon set up & the proofs forwarded to him, duplicates or more if he desired, & thus he could conveniently revise & enlarge or qualify as the case might require, and I suggested that it was not improbable that you & Dr. Deane might have additional facts by January.

I think highly of Dr. Dana's [Deane's] article & regret its postponement, but are more than full of matters for which we are pledged.

I have not yet had leisure to attend to the drawings but we shall soon ascertain what we can do and you shall know the result & proofs will be forwarded to you.

As you cite the opinions of friends on this side of the Atlantic, perhaps it is fair that you should know what is written to us from the other side. A very eminent geologist to whom we had never named the controversy or in any way alluded to it in relation to him, expresses recently in a letter to my son, & subsequently in one to myself, his great regret that you have thought it necessary to bring this matter before the public, as I suppose he learned from the report of the meeting at Washington. I would only suggest that if you could somewhat alter a few sentences in your phraseology so as to let the narrative of facts speak for itself, omitting constructive inferences as to what constitutes discovery & leaving the scientific world to pass judgment, it would have been better. Your language is mild & kind but it will I suspect be thought to depress Dr. Deane lower than an active & intelligent observer ought to be placed. Remember that these suggestions are from your earliest geological friend and one who stood by you & vindicated you from the first in this matter & has never swerved since. Take the suggestions for what they are worth. My son is travelling in New Hampshire &c and will be absent probably three or four weeks.

I remain my dear sir as every truly your friend & servant,
B. Silliman

Prof. Ed. Hitchcock

I have refrained from expressing any opinions of your relative claims to Dr. Deane, holding myself neutral both as an editor & a mutual friend."

BS to EH, box 4, folder 3
"New Haven Sept' 12, 1844
To Prof. Hitchcock
Dear Sir,

Soon after, if not with this letter, you will receive a proof of Dr. Deane's reclamation. As you have both of you stated your facts and signed your case, I hope that both of you will agree to let the cause go to the grand tribunal of the scientific world without rejoinder.

Should you however reply, we beg that it may be brief & prompt: the Journal is more than full so the end of the month will soon bring us up. If you have any thing to add that appears to you indispensable, it will be necessary to send a MS copy of your remarks to Dr. Deane as well as to me, without delay, & he will do the same by you should he give to your rejoinder a surrejoinder; but you will both remember that there must be a last word & you must stop somewhere. In my judgment it were better to stop where you are and in any event stop in this No. & vol. The coral controversy and the bird track discussion have recently presented new frictions in the Journal which we would exceedingly regret to have assume a controversial & petty character.

As between yourself & Dr. Deane I have endeavored to maintain the impartiality of an editor & a mutual friend, & my correspondence with both parties is with my full consent perfectly at the disposition of both.

I hope that you & Dr. Deane will not give up your friendly relations. It is much better to meet soon & shake hands. Consider the discussion as a matter finished and go on as if nothing had happened.

My son joins me in the cordial regards with which I am, my dear sir, as ever truly yours,
B. Silliman

Prof. Ed. Hitchcock"

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania
"Amherst Sept. 16th 1844
Dear Sir,

On reviewing your letter of 12th instant since I forwarded my Rejoinder to Dr. Deane this morning, I have been led to fear that you might not insert it in the Journal since you require it to be 'brief' as well as 'prompt.' I write therefore again to express my strong desire that it should appear, & in the October number. So anxious am I that I should prefer to have it put in small type as a sort of appendix to the No., as I believe you have

sometimes done in such cases so that subscribers could if they pleased cut it off when they bind the volume. I say I should rather it would appear in that way and the expense of printing be charged to me than to have it omitted. In my Report I have touched the matter as lightly as possible to save Dr. Deane's feelings. But the extraordinary claims of his paper demand a more plain & full statement of the case in order to [sic] my vindication & you will see that I have given some new views of facts that have an important bearing upon the case, & I know not how to be more brief & do myself any sort of justice. It is probable indeed that I might get my reply into some of the newspapers: but that could not bring the case before the proper tribunal. The fact is that it has been almost exclusively through the pages of the Journal that these statements have gone forth which have produced a very wide impression among scientific men on both sides of the Atlantic, as I have abundant reason to know, that I have not only claimed what did not belong to me but have been guilty of unfairness & illiberality toward others, & it does seem to me that I have some claims to vindicate myself, if I can, through the same channel. And the bolder & unexpected assumption & charges of Dr. Deane can be met only by my Rejoinder. I feel a deep sense of injury in this matter & bound to do all in my power to wipe off the imputations that rest upon me & resist the injustice which has already in part been done me, & which is now attempted to be consummated. I feel no disposition to injure Dr. Deane but am bound to vindicate myself. I hope therefore that you will do all you can consistently with the interests of your Journal to give me the opportunity. But I will add that if you discover in my rejoinder an improper spirit, any thing that is not fair & manly, I do not ask its insertion.

I thank you mainly for all your efforts & advice in respect to this most unpleasant affair & regret that I could not omit the whole subject as you suggested. But I fancy that I know more than any one else as to the position of the matter in the minds of scientific men & the need of a statement of facts. I have long tried to avoid the necessity: but self respect, a sense of injustice, & a regard to reputation have forced me to it. Inordinate ambition may be the motive: but if so I am exceedingly ignorant of my heart.

Allow me to add that trying as this subject is, in every other respect its religious aspects are of a quite different character. Knowing how dangerous to a man's spirituality of mind is a devoted attention to scientific pursuits, especially when he must depend upon those pursuits for any reputation in the world, it has been my daily prayer that my desires after higher objects might not be thus lessened: but that God would so order the result that it would purify and exalt my Christian character (if I had any) instead of blighting and maiming it. Now I am a believer in the old-fashioned doctrine of Divine Providence in all events, and when I find that just as I was lifting the cup of success to my life, wormwood & gall have been infused into it, not by enemies but by professed friends and that too in a case where I did not suppose such a result possible. Can I doubt but it is an answer to my prayers & is intended to teach me the vanity of the noblest worldly good? I mean scientific reputation & how a mere breath may rob one of his most hard earned & deserved honours & how infinitely important therefore it is to place our hopes upon these few nobler objects that lie beyond this world. Such I hope in some degree is the effect of this movement upon me & therefore I do feel thankful for it because it leads me to hope that God has not utterly forsaken me. Indeed such is the effect upon me at this time that I feel an aversion to any scientific effort that has not a bearing upon religion.

Pardon me this sermonizing which I did not mean, when I began the paragraph, to carry beyond one or two sentences: and believe me as ever,

Respectfully & sincerely yours,

E. Hitchcock

P.S. The note which Prof. Shepard will hand you respecting the Lincolnite can as well as not be deferred to a future No. of the Journal.⁶³³

I hope you will not longer pay postage upon letters that relate only to my concerns.

Please permit my respects to your son & to Mr. Dana if he is with you. I intended ere this to have written to the latter to thank him for a variety of favours."

BS to EH, box 4, folder 3

"New Haven Sept^r 19, 1844

My dear sir,

Having just directed to you an original letter of yourself [July 30] 1835 and invited your attention to a passage in it, I now add a few remarks in regard to your late letter of the 16th.

[Silliman's notes of Sept. 19, 1844, on the flaps of Hitchcock's letter of July 30, 1835:

⁶³³ Hitchcock, "Extract of a letter from Prof. Hitchcock, respecting the Lincolnite," AJS 47, 2 (Oct. 1844): 416.

“New Haven. Sept 19, 1844. My dear sir, In searching for Dr. Deane’s missing communication I stumbled upon this letter of yours which appears to have some bearing upon your present discussions. I have underscored & side-marked the passage to which I refer. I have your late rejoinder which is in type & will soon reach you. The passage which I have marked within will perhaps induce you to modify one or two of your later observations. I will write again soon being at this moment much possessed going to N.Y. but Mr. Dana will attend to proofs. I am to return on Monday next. I have informed Dr. Deane that I have sent you this letter. Yours, B. S.”]

Although the Journal was already more than full we could not think of placing you in an appendix as you ought to appear in close sequence after your antagonist.

I saw nothing in your reply which I felt authorized to alter except to substitute no for ‘feather,’ the latter having what you did not intend, a contentious bearing.

I did not feel at liberty to alter the spirit of Dr. Deane’s piece although I did suggest an omission of the same kind as above alluded to & for the same [reason], & it was done. I should prefer to have you say ‘as by a friend;’ rather ‘friends’ in the plural number for if I have been in any degree auxiliary to what gives you so much pain, it was certainly unwittingly and without any thought of such a result. Had I been as well aware as I now am of your feelings in this affair and of your view of facts, I should have framed those remarks very differently in my address at Boston, & now regret that I did not show them to you before they were uttered. But my object was chronological statement & historical justice & I intended to give you the decided prominence which you deserve. It so happened indeed that the specimens sent by Dr. Deane & at my suggestion were those which produced conviction, but not improbably your previous sendings would have been successful had they arrived as Dr. Deane’s did in conjunction with the bones of the Dinornis.

I exceedingly regret this painful controversy but I do not believe you need regard it as a special rebuke although such things (& I have a share) ought to check our worldliness mindedness even in studying the works of God & bring us back to himself & to the Savior who is our hope.

I do not believe that the impressions to which you refer among scientific men will impair your fair & deserved fame. I believe I said or wrote to you last year about all that I could suggest now on that point. I must add however that when you speak of ‘professed friends’ in the plural, implying they are not true friends, I cannot admit its just application to myself, nor am I certain that you so intend it, but it is not worth giving you a second thought. I can appreciate & make allowance for your feelings, especially with a peculiar physical temperament, & I shall remain as I ever have been your faithful friend,

B. Hitchcock

Prof Hitchcock

Dr. Deane I believe will not reply to your rejoinder if I understand him correctly, but as he has added some sentences to his proof, you will receive it again.

Both you & he are honorably noticed in Dr. Mantell’s Medals of the Creation of which I have had only a glance, & his conviction is disclosed fully.”

BS to EH, box 4, folder 3

“New Haven Nov^r 1, 1844

My dear sir,

Yours of the 27th with the commⁿ for the Journal is at hand and the paper will soon be in type & will be forwarded to you & I have given orders for the 20 extra copies. Before this letter goes I will also ascertain with respect to the extras of the late correspondence & trust that they have been reserved, & if not (which I should regret), we will forward to you our own reserved copies; we always have half a dozen struck for ourselves. I am very glad to have Mr. Owen’s letter & your additional remarks.⁶³⁴ I supposed that the proof of Dr. Deane’s last rejoinder was forwarded to you & him, agreeable to the orders given the printer, but I now suppose it was neglected until it was too late; for, fearing that in the winding up it might be neglected, I called at the office especially to see that they attended to it. Had I supposed you would not see it, I should have objected to those personal things. I cannot sufficiently regret that you did not at once express to me your dissatisfaction as to the manner in which I mentioned Dr. Deane & you in the address at Boston. I intended merely historical and chronological justice & thought that the more ample terms in which you were spoken of in the same sentence

⁶³⁴ “Extract of a letter from Prof. E. Hitchcock, embracing miscellaneous remarks upon fossil footmarks, the lincolnite, etc., and a letter from Professor Owen, on the great birds’ nests of New Holland,” AJS 48, 1 (April 1845): 61-65. Letter signed Oct. 25, 1844.

covered your claims. It is obvious that I would not, when I knew you were to be present to hear, venture on anything that was not intended to be both true & fair. I know that I should be incapable of doing it under any circumstances, as I trust you also believe: but had you been frank with me, I would at once had [sic] put the matter right with the association and modified the language before publication so as to satisfy you, which would not I think have been difficult. Most assuredly I should have communicated the M.S. to you before pronouncing the address had it ever entered my mind that there was or could be imagined to be cause for dissatisfaction. In all my courses of lectures in the cities & towns as well as in college, I was and am still your warm defender as regards these discoveries, but my voice was no longer necessary as your claims & the genuineness of the discovery have been long admitted. I was however, I suppose, the first public teacher who espoused them before the world & this I did at once & without waiting for the opinion of any one, and I have ever held you up both in College & out as one of our brightest lights. Dr. Deane has written me lately of some new discoveries and I have advised him to communicate them to you as a friendly overture towards recovering a good understanding & I hope you will overlook human infirmity & forget what is passed. I believe you will stand & do stand right on this subject with the scientific world.

One thing I should explain to you. The letter of your own writing which I sent to you, I found while searching for Dr. Deane's lost MS which he was confident he had communicated to me. As your letter afforded proof that there had been such a communication, I merely cited the fact & nothing more in letters to Dr. Deane, & that you had requested me to delay its publication, a request which I thought reasonable and actually complied with & I presume I so informed Dr. Deane as it would have never entered my mind that he would be dissatisfied either then or afterward so.

Are you willing to give a synopsis of Mr. Owen's late paper on the *Dinornis*? I know of no person who would do it so well and I think it would come with peculiar propriety from you, with your name, and although the Journal resources are not here ample, I would pay for the contribution should that be agreeable to you. I regret extremely having been unwittingly the cause of suffering to you, for there is no man towards whom I have kinder feelings, & few who command an equal share of my esteem, but I really think you should not let the affair trouble you any further, for I am sure your reputation is as safe as it is deservedly high. I have not been without my share of undeserved infliction. I was represented to Mr. Lyell as having instigated those attacks upon him in the papers. A common friend without my knowledge either of the imputation or of his volunteer action upon it, took great pains with Mr. Lyell to counteract the slander. I wrote an indignant denial addressed to Mr. Lyell but suppressed it at the earnest request of one of our Boston friends, and Mr. L. & I are again interchanging letters & there has between us been no allusion to the affair. It is not worthwhile to say more now; when we meet I may explain myself. Please to recollect that at the next meeting of the association you will lodge at my house D.V.

My son joins me in my kind embrace to you, Mrs. H. & your children. I hope Mrs. H. has not made a black mark against me & that if she has, she will blot it out. I remain, my dear sir, as ever very cordially your friend,

B Silliman

Prof. Edw. Hitchcock.

I have not yet read Owen's late Memoir but am studying Mantell's Medals of the Creation.

We think here that had you in the beginning or early in the affair said a few kind things as to Dr. Deane's merits, as you have now said them in the winding up, he would have been perfectly satisfied and you would have been regarded as acting with magnanimity and your own merits would have [been] promptly and fully acknowledged by him. I have always thought him entitled to more credit than that of merely 'putting you upon the track' for I know that he has labored with zeal & success & with considerable sacrifice. I did not say that his labors were before yours. I did not mean so, but his information & his correct impression were earlier than either yours or mine, & this was a historical fact which gave him priority in the historical record, which was all that I intended.

If it is of any importance to correct the misstatement as to you being under public pay, that can be done & should be, if you will send a paragraph to appear editorially.

PS Your extra copies are ready & will be forwarded."

BS to EH, box 4, folder 3

"New Haven December 9, 1844

My dear sir,

I have yours of Nov. 30th and am happy to observe that we shall so soon see you here. Your coals will be in good request here for the young men have had very little on that subject.⁶³⁵ You observe doubtless that they have curtailed the Iguanodon about one half. Owen reached him & Dr. Mantell agrees to it.

I shall hope to go & hear you, trusting by that time I shall feel easy to leave Mrs. Silliman for an evening. She is now recovering from a dangerous pneumonia & bilious attack but is still confined to her room & her chair & bed alternately.

There is however nothing to prevent our giving you a bed & I shall be much gratified if you will come to our house (especially if the Institute have not provided your lodgings) and in any event I could desire it so that we may see as much of you as possible; and our library will be a lounge for you.

Hoping soon to see you, I will not touch on other topics except to say that Deane has made his amends & it will require no reply: it will go in of course in the January No.⁶³⁶

In a review of Dr. Mantell's Medals of the Creation under the head of ornithichnites, I have added in a note my view of the case of Dr. D. & yourself. I intended to forward it to you & should be governed by your wishes as to inserting it or not, or I would modify it until it is right. I will have it set up against you come & endeavor to hand you a copy of it for your judgement, for it shall not appear unless it suits you.

I trust you will come to our house where you will find a warm welcome & a warm bed.

As every truly your friend,

B. Silliman

Prof. Hitchcock"

BS to EH, box 4, folder 3

"New Haven December 19, 1844

Dear Sir,

Yours of the 16th has given me pain. I did not suppose that you could be dissatisfied with my verdict as contained in that note after having learned that part of the review with which it is connected, and after expressing your approbation of the note and your preference that it should go in, for you will remember that I urgently desired you to be entirely frank & not keep silence as at Boston, & then find something wrong when it is too late to correct it. You will remember that I offered to suppress the note entirely, or to add, alter or modify it in any way to make it entirely satisfactory to you, adding, that as I had been the cause (although unintentionally) of the mischief by what I said at Boston, I could not think of having another blunder. Your decided expression of the wish to have the note go in as it was, without alteration, you adding also that I had done you more than justice, left me in no doubt that I had satisfied you & that this note would be regarded as my decision on that part of Dr. Mantell's words with which my view, as presented in the note, did not agree: I did therefore consider myself as speaking out & not keeping silence as you appear to understand it. It is obvious however that your feelings have been again injured by the erroneous view which Dr. Mantell has presented & concerning which I told you I had written to him with a particular request that it might be put right in his second edition and this private action in the case, connected with the summary in the note, I considered as discharging my duties both as an editor & a friend of all the parties.

With the views which you entertain, I see no way but for you to address a reclamation to Dr. Mantell and me, stating your view of the injustice of the statements in the Medals & of the deficiencies or errors of my note. This reclamation shall appear in my appendix to the present No. (it is too late for the regular pages already more than full) as was done some years ago in the case of Captain Basil Hall & more recently the case of Gauthony [?] & Dana's. In reply to published errors or misstatements, it is proper to publish an address to the offending individuals before they have seen it. Dr. Mantell will thus have before him the means of making the 2^d Ed. of his Medals correct, and I will take care that Dr. Deane does not reply as there can be no occasion, it being not a revival of the controversy with him but a new overture to new facts. This proposed letter can be postponed till your communication & mine are forwarded, because the appendix can be printed & got ready as the last thing before putting on the address.

As to Dr. Mantell or any one also having a prejudice against you (Dr. D. perhaps excepted), I know of nothing whatever to discountenance such an impression & I do not believe it.

I will tell the printer to find you Dr. Deane's remarks on the tracks (quadrupedal); it is not at hand or I do not remember what it contains: I think he has done you justice. I did not remember that you had recently obtained

⁶³⁵ No information about this lecture and visit to New Haven has been found.

⁶³⁶ James Deane, "Description of fossil footprints in the New Red Sandstone of the Connecticut Valley," *AJS* 48, 1 (April 1845): 158-67. Signed Nov. 20, 1844.

any new & large tracks and regret it if I have omitted to name any posterior to your published descriptions & posterior to those observed by Deane & Marsh.

In a return proof from Dr. Deane there is no correction except of a date —1835 instead of 1834. There is no remark upon Mr. Marsh and I do not know who he is except that Dr. D. has written about him as a co-worker.

I am now more desirous than ever that you should furnish the remarks upon Deane & please put in figures on the top of the MS. the number of extra copies you would wish for yourself.

I remain as ever your sincere friend,

B. Silliman

Prof. Hitchcock

P.S. I have communicated your letter & this reply to our judicious friend [James Dwight] Dana, and he suggests another course, that is, agreeably to your own inclination, that you should make your communication formally to Dr. Mantell and he thinks it would be better for me to make it in my own name, you furnishing the materials, and if you desire it. Dr. Mantell would then publish it in the English Journals.

We both think that the statement should be calm, condensed & without any imputations on Dr. M., Dr. D. or any one, but containing the facts of the claim.

Should you take this course perhaps you would allow me to read it should there be occasion, & then send it to you for your reaction & it should in no case go without your full approval upon due consideration.

My regards to Mrs. Hitchcock & request her to accept Jacobs from me as it may amuse her & the young ladies. Of Jacobs I have no other knowledge than the book itself: it appears to me to be authentic, very probably dressed up for the public by a literary man as it is written very artfully & in a pleasing style.

Pray what was the result of your Monday Corporation meeting?⁶³⁷

[Written in the space above the salutation:]

My son took your specimen to Redfield⁶³⁸ & your communⁿ for Mr. Tyler went immediately.

BS to EH, box 4, folder 3

“New Haven December 19, 1844, P.M. 4 o’cl.

My dear sir,

Since mine of this morning was mailed I find that the note is still in proof & therefore under control: also Dr. Deane’s new article. I have have directed to have both sent to you & also Dr. Deane’s drawing. I hope then at once & without further response to make that note what you wish it, or furnish a new one of like scope. It is easier to make a new one & let us have it right at last.

If there is any thing in Dr. Deane’s piece that does not do you justice let me have also your remarks, keeping nothing back, & I will do all that the impartiality of an editor can with propriety do to satisfy the desires of a friend. As the press will wait, you will use all practicable speed. You do not say when you are going to lecture or I might direct this to you, but suppose Mrs. H. will forward it if necessary.

In great haste,

[unsigned]

Prof. Hitchcock”

EH to BS, box 5, folder 18

“Richmond Va. April 5th 1847

Dear Sir,

I had not time before I left N. York to reply to yours of the 27th ult., received through Mr. Sheffield.

I had thought that I should prefer to have no account given of the large track rather than to give a reduced sketch of it because such account will make only a slight impression even on scientific men whenever such a drawing would at once make a deep impression. But I am unable to afford any pecuniary aid for such a drawing & you inform me that the Journal cannot do it. The Boston Journal of Nat. History might perhaps do it: but I prefer to have the first description appear in your Journal & therefore submit to have you reduce the large drawing as much as you find necessary. Would it not be well to mark upon the reduced sketch just how much it is reduced?

⁶³⁷ In December, the Amherst professors told the trustees they would accept the declining college income in lieu of salaries, would take over management of the college, and would want Hitchcock to be named president. These proposals were accepted, and Hitchcock was inaugurated in April, 1845. See *Tyler 1873*, p. 269.

⁶³⁸ William C. Redfield (1798-1857) was a meteorologist and geologist.

The paper I suppose will need no alteration except perhaps a few words which I will thank you to make.⁶³⁹ Whether I shall ever be able to make out a more systematic account for the Am. Academy of Sciences or any other Society, is very doubtful for I have found it very difficult to prepare even the account which I sent to you.

I am very glad to escape for a time the piercing winds of N. England & to breathe freely in the delightful climate of this place. I came round by the way of Norfolk (down Chesapeake Bay & up James River) & really it was a most delightful excursion especially up the river. I find however that a new pair of lungs is what I want more than a pleasant climate.

I think I shall not go farther south than Richmond & my present plan is to remain here for a few weeks till the climate of Massachusetts becomes endurable. If I can do any thing for you in this city please command my services as I have nothing to do except to endeavor to be as lazy as possible.

Respectfully & sincerely yours,
Edward Hitchcock”

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania
“Amherst January 26th 1850

Dear Sir,

I have just learned that the long struggle of your beloved wife with disease is over: and although I know not what to say that will afford comfort to your bereaved spirit, I feel disposed at least to express to you my sympathy.

I have not heard any particulars of Mrs. Silliman’s death. I only know that she has long been a sufferer: and although it may afford some alleviation to realize that the conflict is ended, and to think of the great contrast between her present & past condition, yet I do not suppose that the long continued expectation of a friend’s departure tends to make the final separation less trying, but rather the contrary.

Through the kindness of Providence I have never had any personal experience of such a trial as yours. Yet I have tried sometimes to realize such a separation: and it is almost the only earthly trial which I cannot think of with composure. Hence I can, from some idea of the severity of the blow that has fallen on you in the loss of one so worthy of your love & so tenderly beloved.

Some may think that the great length of time you have been permitted to enjoy her society might make the separation less trying, because perhaps the period much exceeds your early anticipation. But I must think that the longer the time such a union lasts, when founded on pure affection, the stronger do the cords become & the more painful their disruption.

No: it is not in such considerations that you can obtain relief. But when you realize that it is God, your best friend, who has done it, & has done it too as an act of friendship, here is firm footing; here a foundation for true consolation.

And there, too, I doubt not, that the thought how short the separation will be, must sometimes come over your spirit with a soothing power. It was in the hope that some things I have said in a little volume of sermons that I have lately published, especially in the one on the Resurrection, might afford some consolation to you, & also to your departed wife, that I sent you a copy.⁶⁴⁰ But I suppose it reached you too late for her to examine.

After all, in such calamities, I also feel that the afflicted need special support from Divine Grace, such support as nothing but fervent prayer will bring. And my sincere desire is that such grace may be given you in rich abundance, so that you may be able to say, it is good for me that I have been afflicted.

Most truly & sincerely yours,
Edward Hitchcock

P.S. Mrs. Hitchcock desires to join me in the expression of condolence towards you & your afflicted family.”

Benjamin Silliman Jr. to EH, box 4, folder 4
“New Haven June 22, 1850

My dear sir,

Yours of 20th is rec’d. I Suppose that I have probably as good specimens of Spodumene for the College as those you describe. Still, I should like to see them and the Priplite. You might make up a recall box & include a specimen of the Chromate of Lead as it seems to be, for if I see correctly the prism is Oblique. Is it American or

⁶³⁹ “Description of two new species of fossil footmarks found in Massachusetts and Connecticut, or, of the animals that made them,” AJS ns 4, 10 (Nov. 1847): 46-57.

⁶⁴⁰ Hitchcock, *Religious lectures on peculiar phenomena in the four seasons*. Amherst, 1850.

foreign? I am aware that I owe you some minerals and shall be soon ready to pay you. I will then return you such specimens as we do not keep or their equivalent.

Yours truly,

B. Silliman Jr.

Mr. Hitchcock”

BS to EH, box 4 folder 4

“Revd Pres. Hitchcock.

Hanover N.Hampsh. Dec. 30, 1850

My dear sir,

Your kind letter of the 24th was forwarded to me from New Haven and I presume that the error regarding the payment for the Journal has been corrected. I expect to be at home tomorrow and will see that all is right. Personally I knew nothing of the matter and regret that such an oversight should have occurred.

I thank you for your notes of Dr. Mantell & of the pains through which you have passed. They must have been full of interest and instruction. I know but too much of the history of Dr. Mantell’s domestic unhappiness & of his personal infirmities and keen suffering as well as high enjoyment which his ardent & impulsive temperament cause him to experience. He has dropped to me occasional hints of his possible removal to this country but I have no confidence that it will ever take place. His son is so young & with English training will find it difficult to americanize himself & to obtain business when there is so much competition among our engineers who have been trained both to the physical & moral peculiarities of our country. Young Mantell is now in the West between Louisville & Cincinnati as headquarters & my son thinks he will eventually succeed.⁶⁴¹

I should like some references to religious people.” [no signature]

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania

“Amherst Oct. 16th 1852

Dear Sir,

In a recent conversation with Prof. Shepard, he alluded to the fact that in my ‘Religion of geology’ I had made no quotation from your writings, & consequently that your name was not mentioned in the work. It was only recently that I was aware of this fact. Some train of thought started the question in my mind, whether I had not done Prof. Silliman a seeming injustice, by not referring to his works on the same subject. I could not bring myself to believe that I had been guilty of such an omission, till I had looked through the volume, when I found it to be so. I mention these things to show that the omission was quite unintentional. Certainly the idea never entered my mind till a few weeks ago; & I need hardly say how mortified I am that such is the case. Merely as one of the earliest & ablest writers on this country on the connection between geology & revelation, I ought to have referred to you. And still more, when I recollected how much indebted I am to you for patronage & assistance in my earlier studies; how in fact you have been my master & guide in them all. Although, therefore, the fact that I have done this thing unconsciously may clear me from all intentional disrespect, it does not allow a satisfactory reason [for] the omission. Nor can I find any that satisfies myself, & much less will it satisfy you.

A difference of opinion does not afford such a reason. For I have always supposed that on this subject our views were essentially alike. The only point wherein I suppose we formerly differed respected the meaning of the word day in Genesis; & this I never regarded of importance, because we agreed as to what I regarded the main point, the long period between the beginning & the subsequent acts of creation. Indeed, I have had the impression for many years that your views about the nature of the demiurgic days had been modified, & I do remember that a doubt about that point was what led me to omit your name in stating the ablest defenders of the long periods. (Relig. Geol. p. 66).

But allow me to state one fact. When I prepared my lectures 8 or 9 years ago (although this was not the object that led me to write them), I expected to deliver them before a select & to a great extent clerical audience in London, where they were actually announced by Dr. Carlyle. My references therefore were mainly to European authors, & to those whose opinion upon biblical exegesis would command respect. My election to my present office prevented my going almost at that time; and when I did actually go, circumstances were so changed that I made no attempt to deliver the lectures: and on my return, they were published without much revision. I still had the clergy very much in my eye, & quoted mainly from those authors whom they would respect for their skill in biblical interpretation. Probably this fact had something to do with the omission of your name. For though I think

⁶⁴¹ Walter Mantell (1820-1895) had emigrated to New Zealand in 1839, and returned there after a brief sojourn in America.

you have given an exegesis of Moses, highly creditable, yet I suppose that neither you nor I can expect that our opinions upon a mere philosophical question will be much regarded by the theologians.

But though these statements may show how it happened, that without knowing it I omitted your name, they do not in my own opinion justify me; because I ought not to have been thus forgetful. I confess that I deserve rebuke. I can only say that the omission was not intentional: that it did not proceed from a difference of opinion: nor because I was not deeply sensible of my obligations to your kindness: nor from a want of respect for your writings. Such respect & gratitude & high estimation of your character, kindness, & scientific labours, it now seems to me I shall ever retain, whether you forgive me this foible or not. And although my work is stereotyped, yet I am determined, if it be possible, that this omission shall not long remain in it.

Prof. Sh. also alluded to the infrequency of our correspondence of late. I have often thought of it with deep regret: but on my part I think I can explain it. Since the transfer of the business part of your Journal to your sons,⁶⁴² my correspondence in relation to that, has been with them. But the main trouble has been the overwhelming amount of labour & care that is upon me, while disease & old age have vastly reduced my ability to work. I estimate that I am compelled to write at least 600 or 700 letters yearly: & for the last six or eight years I have never know the time (save when I went to Europe) in which my desk did not contain from 40 to 70 unanswered letters, some of them one or two years old. To my own sister I have not written for three years, nor to several essential friends who are in distant missionary fields; nor because I am borne down by infirmities & labours, especially if I try, as I still do occasionally, to prepare my scientific & religious articles. This is the sole reason why I have not written oftener to you. Could I escape from my present office as I have been long trying to do, it would take off a mountain load & enable me to be more faithful to friends, & afford, I could hope, some relief to a worn out body & a jaded mind that now makes me a constant & a severe sufferer.

With undiminished respect & gratitude, I remain truly yours,
Edward Hitchcock”

BS to EH, box 4, folder 4

“New Haven Octob^r 27, 1852

To Rev^d President Hitchcock,

Dear Sir,

Your letter of the 16th was particularly acceptable as it enables me to return to those relations of friendship which it was painful to me to feel had been in danger of being weakened. The courtesies of science and literature & of a friendship of many years required, as I thought a mention of earlier labors by one who was the first to attempt in this country to impart instruction in geology, on any considerable scale of effort, and also to meet the difficulties common to all religious minds that had not been enlightened as to the actual structure of the earth, those labors had been also accompanied and followed by other labors in the field & in the Journal of Science, in which you became an early and distinguished participator; and you afterwards rendered great service to the cause by investigations numerous, varied and successful, which it has ever been my pleasure and pride to set forth in a strong light before my pupils and the public. Recognized as my efforts had been both at home and abroad by such men as Buckland, Mantell & J. Pye Smith & others of the same standing in science, including also my views on the question of time in geology, and Dr. Smith having in his last edition especially quoted my views at large, it seemed to me impossible that they should not have recurred to the mind of my earliest pupil and I was therefore fearful that if our friendly relations had not died out, my views were not deemed important enough to be noticed; and still this conclusion was so inconsistent with the demonstrations at Amherst in June 1848, that I was greatly perplexed & then mentioned the subject to our common friend Prof. Shepard.

I am glad that I broke silence, because the communication has elicited from you a letter conceived in a spirit of Christian and gentlemanly courtesy and I therefore now dismiss all feelings of distrust and you will consider this letter as a full recognition of our former friendly relations. All that is passed by, that tended to disturb our harmony, we will give to the winds. As to intermission of letters there is quite as much occasion for apology on my part or on yours. I can fully appreciate the onerous burden of your correspondence. I believe that no less than 1000 letters a year were written here previous to my relinquishment of the care of the Journal. Now, I am much relieved on that subject and as the evening twilight of life is deepening upon me, I am naturally withdrawing from the world & the world from me.

I entertain a sincere sympathy for you as the honoured head of a College which has become an important auxiliary to the older institutions of New England in the common cause of religious harmony. Still, for your own comfort & from feelings of friendship, I could wish you to be extricated from such a routine of labors so

⁶⁴² That is, son Benjamin Jr. and nephew Benjamin D. Silliman.

oppressive and exhausting. I shall be happy to make Mrs. Silliman acquainted with Mrs. Hitchcock and your daughters & it will give us pleasure to see any of your family here.⁶⁴³

With our kind regards to them, I remain my dear sir, as ever truly your friend,
B. Silliman”

EH to BS, box 5, folder 18

“Amherst Nov. 3d 1853

Dear Sir,

On my return home yesterday I found your very valuable & acceptable present of a copy of your recent *Travels in Europe*.⁶⁴⁴ I had noticed an announcement of the work & requested the booksellers in this place to procure me a copy which I believe they have just received. I promise myself much pleasure in the perusal of the work. I have as yet spent only fifteen minutes in that way: but long enough to see that the same attractive elegance & clearness still remain in your style which I have so often admired. You may remember that I once applied to you a couplet of of *Hudibras* --

‘He would not open his mouth but out there flew a trope.’⁶⁴⁵

I perceive that a large part of your book is devoted to regions which I did not visit when abroad, so that I shall be more instructed by those parts.

I have lately got out one of the small works of which I had intended to send you a copy: but have not as yet received any duplicates. I hope to have some in a few days when I will send you a copy.

I have been making a good deal of effort this autumn to increase my collection of footmarks both by purchasing from Mr. Marsh’s collection & by digging. As to the latter however I make poor work of it. But in one way or another I have got some good specimens though at high prices. Indeed there is now a sort of California excitement as to these tracks & placers for footmarks are now about as difficult to obtain as a gold placer. I expected to see an agent from Yale at the auction.

My oldest son expects to marry a wife at Bridgeport the week after Thanksgiving & probably myself & wife will be there. If so I shall try hard to call on you at least from one train to another as I have long desired to do. And I wish I could offer some temptation for you to visit Amherst.

I have spent three days of the present week in measuring a geological section quite across the Connecticut Valley. I hope to get out some valuable results. I wish a similar section were measured in Connecticut for comparison.

In haste, respectfully & sincerely yours,
Edward Hitchcock”

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania

“Amherst Jan^y 16th 1854

Dear Sir,

After leaving your house the other day I took a turn past your Cabinet & standing against the steps I saw a remarkable specimen several feet square which I was in doubt what to denominate. Is it the trail of some animal or a vegetable impression? Whatever it is, it seemed to me too good for such a place.

For want of time I did not try to enter the Cabinet; which I afterwards regretted. For my youngest son who was in N. Haven the day previous told me that he saw there under a glass case, I think, what he regarded as a better specimen than any we have here of the *Otozoum Moodii*, unquestionably the most remarkable of all the track-discovered animals of this valley. He thought the stone resembled that at the door above referred to. Till within a few months I had supposed South Hadley the only known locality of this track. I have never discovered it at Turner’s Falls & yours will make a third locality. Please let me know where it is.

May I trouble you to hand the enclosed five dollars to Prof. Dana as my subscription to the *American Journal of Science* for 1854!

I find I have lost No. 43 of the New Series of the *Journal*. If Prof. Dana could send it to me through the mail with the price marked upon it, I will send back the sum.

I mentioned in my last, I believe, that I was measuring a section across Connecticut valley through Turner’s Falls. To my surprise I found the sandstone there to be more than 14,000 feet thick! Making the largest

⁶⁴³ In the fall of 1851, Silliman married Sarah Isabella Webb. His first wife, Harriet Trumbull Silliman, born 1783, had died on January 18, 1850.

⁶⁴⁴ Silliman, *A visit to Europe in 1851* (New York 1854).

⁶⁴⁵ Samuel Butler’s satirical poem, 1663-1678.

allowance for errors & the inclination of original deposition, it seems to me clear that we must have in this valley a good deal more than the Lias or even the Permian added. Perhaps we shall get back to the old opinion maintained I believe by you that the coal formation & even the Old Red Sandstone exist here. I have drawn other inferences of importance but have no time to state them. I find it much better to measure rocks than to guess at them.

Respectfully & sincerely yours,
E. Hitchcock

P.S. I find among my pamphlets a duplicate No. of the American Journal of Science: viz. No. 10 of the new series, vol. 4. Prof. Dana is welcome to it if he will pay the postage.”

BS to EH, box 4, folder 4

“New Haven January 24th 1854

To President Hitchcock

Dear sir,

Your letter of the 16th came to hand just as I was about departing for New York on a mission in favor of Y College funds. I therefore handed the letter to Mr. Dana for him to answer as regarded the remittance of \$5 to which I presume he has attended as well as to the missing Nos. of the Journal. Being about to go to Boston tomorrow morning on the same errand, to meet alumni and friends of Yale. I write this hasty note (10.00 P.M.) that I may not appear to neglect yours.

The slab of stone which you saw leaning against the steps of the cabinet is indeed very interesting and I agree with you, it is quite too much so to remain in the exposed place where it now stands. The truth is that when it arrived a year ago last July with several other fine impressions & reliefs, a present (freight paid) from the head of the Portland quarry opposite to Middletown, we did not know how we could place it in the cabinet where the other pieces were hanged. You have thrown out the only hints that have occurred to me respecting the probably origin of the impressions. I described them in a letter to Dr. Mantell and asked his opinion, but he was then drawing towards the end of life and I never received a reply.

I have not been able, owing to absence from town, to visit the cabinet since your letter came. I have often noticed and pointed out to visitors the grand foot impression which attracted your son's attention. My son thought it worthy of protection and it is quite honorably lodged behind a large piece of plate glass. I presume you are right in the designation. I am not posted up in his kind of language. When freezing is over I can have a cast made of it for you if desired. I trust that you will in your next call on us give yourself a little more time and I shall be ready to go with you to inspect some other very good things, both in concave and in relief, and all from the quarry named above. I presume you have seen Dr. Barrat's [sic] exquisite specimen formerly a paving stone, fortunately with the figured side downward so that its most beautiful & perfect copies are fully preserved—in relief if I remember correctly.

The facts which you have ascertained respecting the thickness and other attributes of the sandstone strata in your vicinity are indeed quite remarkable and I shall be glad to know all about your section.

Our kind regards to Mrs. Hitchcock and your daughter or daughters if you have more than one at home and with every good wish [signature cut out by Hitchcock for his album of autographs].”

[BS Jr. to EH, box 5, folder 4

June 26, 1854 (two, one a one-sentence note)

July 29, 1854. All minor, about specimens sought or offered; not to be included]

PVMA Hitchcock papers, box 2, folder 8

BS to EH

“New Haven Jan^y 13 - /55

Mr. Hitchcock

Dear Sir,

In the absence of my son I reply to your enquiries.

1. The inner cup must be porous that the acids may pass through by capillary attraction & be intermingled thus producing an additional chemical action. The hydrogen generated at the zinc surface goes through the pores and is taken up by the oxygen of the nitric acid while by its decomposition nitric oxide gas is evolved & all these chemical actions evolve the electric current.

2. The slit in the zinc is immaterial except to admit of a more ready passage of the hydrogen

from the outer surface of the zinc to the inner & then to the porous cup. It would not annul the power of the battery if the zinc were an undivided cylinder but it would be less active as the hydrogen from the outside would have no way to the inside except by passing under the edge of the cylinder & of course the effect dependent upon the action of the acid on that side would be in a great measure lost.

3. I have never attempted to silver iron by galvanism, but I suppose its ready solubility in acids would corrode and remove its surface faster than the silver could cover it.

The metals which are usually galvanized are of slow solubility in acids, or not soluble at all except by peculiar [?] agents.

I shall be happy to answer any other enquiries.

Excuse the blots. I have no time to copy.

Yours truly,

B. Silliman”

BS to EH, box 5, folder 4

[Following BS signature:] “New Haven Sept’ 17, 1855

To Prof^t late Pres^t Hitchcock

My dear sir,

I have detained quite too long your interesting sheet of foot tracks. Mr. Bakewell has copied them very well. I will send the original drawing to you by Prof. C. U. Shepard (now happily returned) unless I should make you a call myself. I wish to see the original tracks in the rock & to see yourself and your collections. Pray write me exact directions where they are, the foot tracks, I mean the originals of those numerous tracks in sequence which you had at Boston. Please write me where I must leave rail road, stage or whatever, and of whom & where enquire.

Prof. Shepard is desirous I should not visit Amherst until he has made some new deposits there of things now recently brought from Europe, say 10 days hence. Do you obtain any more light as to the author of those tracks, batracian [sic], saurian or whatever or some unknown biped? and if so, how sustained as a batracian [sic] or saurian? I am quite in the dark. After I hear from you I will write again.

How is your good wife? I hope restored to soundness and comfort.⁶⁴⁶ Mrs Silliman unites with me in kindest regards to her, your children, & yourself,

I remain, my dear sir, very truly your friend,

B. Silliman

I have seen that so-called impression of a human foot at the Portland quarry. It does indeed resemble the track of a large human foot covered by a rock, but it is evidently an accidental curvature in the rock with an infilling for the relief and I need not say to you that there is not the slightest mark of organization as in the numerous impressions of the feet of birds and probably reptiles with which you are so familiar.

You, Dr. Barratt & myself were invoked in the prints to settle this matter and I have no hesitation in denying any relation in this impression either to the human or any other organization.

I was at Portland on Friday and after seeing the casts of trees there of the most unequivocal character, I can easily understand those long drawn canal-shaped channels in the slab out of doors by the steps of the Yale Cabinet.

Pardon my half sheet. It was the first paper at hand & I thought to write only a few lines.”

EH to BS, box 5, folder 18

“Amherst Sept. 20th 1855

Dear Sir,

On my return home today I found yours of the 17th & hasten to reply to your enquiries.

I understand you to enquire the name of the track upon the drawing which you have had copied. It is the *Otozoum Moodii*. I have a row of ten of them upon three slabs placed end to end on the outside of our cabinet & about as many upon other slabs, the latter being in relief & the former depressions. I think also that I can show you a row of about fifteen tracks lying in a quarry in S. Hadley eight miles from here where I will take you in my carriage if you would like to see them. In our cabinet we have specimens more or less perfect of nearly all the species that have been described & many of them are in succession. It seems to me that your best way will be to

⁶⁴⁶ On May 4, Orra had a disastrous fall at Amherst’s American House, badly injuring her face .

come here first & from here to any localities you may wish to visit. Roswell Field of Gill five miles beyond Greenfield is getting out species more continually which he sells at a high price: but perhaps you would like to go there. Our cabinet contains a greater variety than any other: but you will find some finer specimens in the Boston Society of Nat. History & in Dr. Warren's house on Park Street.

If you take the railroad train that leaves N. York at 8 o'clock A.M. & passes N. Haven about 11 A.M., you will reach Springfield between one & two P.M. There you can take a ticket to Amherst via Palmer & reach here by railroad at 3 h. 30 m. or from Springfield you can go to Northampton & from thence by stage to Amherst arriving a little later than by railroad. In the morning at 8h 30 m. you can leave for N. Haven or by stage to N.Hampton reaching N. Haven about 2 o'clock. Perhaps you can take one route in coming & another in returning.

I thank you for your kind enquiries concerning Mrs. H. She is so far recovered as to be comfortable & would be most happy as we all should to see you here. Why will not Mrs. Silliman accompany you & stay at our house while we go abroad, if you have time for any excursions or even if you cannot stay but one night? You know that we live in plain style but we will try to make you comfortable. At any rate if you come to Amherst do not fail to drive directly to my house.

I am glad you are settling the matter of human tracks right at Portland. When will there be knowledge of geology enough among the intelligent part of the community to prevent such comedies as occasionally appear in our journals?

I understand that Prof. Shepard will not be here till next week. I too could wish to get the footmarks into our new cabinet before you come: but that will not be till late in the autumn. So I hope you will come whenever your convenience permits.

As I am now giving instruction in geology I am rather more at liberty the first half of the week than the last: but I will be glad to see you at any time & remain

most truly & sincerely yours,
Edward Hitchcock"

EH to BS, box 5, folder 18

[Two large Xs across this letter.]

"Amherst Oct. 12th 1855

Dear Sir,

At my return from South Hadley the other day I found a letter advising me of some fossil bones lately dug up at Springfield & the next day I hastened down & succeeded in getting possession of them. I cannot say yet to what class the animal belongs but I think a good anatomist may. The next day I went up to Turners Falls & found the specimen of tracks Prof. Shepard described very interesting, so much so that I was induced to part with \$150 to obtain it. It will weigh nearly a ton. I almost agree with Prof. S. that it should be named *Bipes diabolus*. At any rate it has tempted me quite strongly. My impression is that it will cast a good deal of light upon the footmarks & I am not without fears that it will weaken or destroy the proof that any of the tracks are those of birds. But I say this as yet inter nos only. When I get the specimen I shall hope to study it carefully.

Your short visit gave us great pleasure & we regret only that we could not make it more pleasant to you.

I know it is too late to insert my drawings in the next No. of your Journal. But if you can add the brief items on the next page among your miscellaneous matters near the end, as an extract of a letter from me, I shall feel much obliged.

With my own respects & those of my family to Mrs. Silliman, I remain

Most truly yours,
Edward Hitchcock."

EH to BS, box 5, folder 18 [second letter with same date, this one with much that is crossed out and rewritten.]

"Amherst 12th Oct. 1855

At the late meeting of the American Association for the Advancement of Science, I exhibited a remarkably fine specimen of a part of the jaw of a shark, allied to the *Pristis* family, obtained from the coal formation in Illinois.⁶⁴⁷ After giving the history of the specimen, I submitted it to Prof. Agassiz who confirmed that it belonged not only to a new genus, but a new family of fossil fishes, and I have requested him to name & describe it. Its history, locality, &c, I hope to send for your next number.

⁶⁴⁷ Hitchcock, "Account of the discovery of the fossil jaw of an extinct family of sharks, from the coal formation," *Proceedings of the American Association for the Advancement of Science*, 9, 1855 (Washington 1856).

Within the present week I have obtained a portion of the bones of a vertebral animal from the red sandstone of Springfield, Massachusetts. The rock is the same, & its geological position, is exactly the same, as that in East Windsor Ct. from which you obtained some years ago similar bones -- the only other instance know to me. For these bones I am indebted to the liberality of William Smith Esq., their discoverer, who has charge of some excavations going on at the United States Armory; and also to General Whitney, Superintendent of the Armory. The larger part[s] of the bone were thrown away by the workmen before they were noticed by Mr. Smith: but I have strong hopes that some anatomists may determine from those that remain, to what class the animal belonged.

Yesterday I purchased a slab weighing nearly a ton from Roswell Field Esq. of Gill, containing some gigantic tracks, apparently of a biped, yet accompanied by most distinct tracks of a tail. It is certainly one of the most remarkable tracks which I have ever seen, & will probably (as well as the bones above described) throw light on the character of the animals that left the footmarks of this valley. I propose for the name of the animal that made the tracks, that of *Gigadipus caudatus* ([Greek letters] biped, or biped tailed giant).⁶⁴⁸ Of this, also, I shall hope to send a description for your next number.”
[no signature]

BS to EH, box 4, folder 4
“New Haven October 13, 1855
Rev^d Edward Hitchcock
My dear sir,

It was very kind in you to write to me so promptly, and we were both glad to hear of your welfare, that of the family and to hear a voice from those dry bones.⁶⁴⁹ If an impression could be made upon all the quarry men that bones are to be preserved and that a reward may be obtained, it might prevent their destruction.

I admire your courage in securing that grand specimen from Turner’s Falls & I hope one day to see it and perhaps other acquisitions. Should our early conclusions be subverted and should we be driven from an aviary into a frog pond, we must even submit and agree to croak, if necessary, not cackle or crow. *Fiat veritas!*

We were much amused by Prof. Shepard’s brilliant thought whereby also perhaps hangs a tail of a reptile if not a tail of a Struthious bird or other bird that wore a tail.

I expect to be here until the 23^d and hope to reach St. Louis by nov^r 1 to 3^d, and there remain a full month, and in all that time I shall be happy to hear from you. Address care of M. U. Sn. McClelland Esq., St. Louis.

Mrs. Silliman unites with me in affectionate remembrance to your good lady & her bright daughters, not forgetting the son. We had indeed a delightful visit at your house and were greatly gratified with the College and its rich treasures.

If I live until spring returns I shall be tempted to spend more time in your region and to visit your famous localities of foot prints. Mrs. Dana was in when I received your letter and she took it to Mr. Dana who will no doubt insert your interesting remarks. From your silence on the subject we trust that Mrs. Hitchcock did not suffer from fatigue and cold during her attendance on Mrs. Silliman. We remained at Springfield overnight & went forward in an early train for Worcester & Woodstock.

Hoping another season to return your hospitality, we remain your grateful and gratified friends.
B & S. I. Silliman

Our kind regards to Prof. Shepard if still with you.

PS Octob^r 15. I have seen Prof. Shepard & he has made a still stronger impression upon me than your own modest letter did, respecting that tail. It strikes me as highly important & DD says that there is no animal without four limbs developed or rudimentary, but he agrees that our colorful tail-dragging animal may have been effectively a biped depending on enormous limbs & feet for support & progression, aided by a tail for a third supporting member & for direction while there may have been arms in advance of the legs & serving as prehensile or defensive organs, kangaroo fashion.

If this view is correct, it adds a new and interesting feature to fossil herpetology & extricates us from serious difficulty as to the walking with the impress of only two feet.

⁶⁴⁸ *Gigadipus caudatus*, in the taxon “*Eubrontes caudatus* Hitchcock.”

⁶⁴⁹ In Ezekiel 37: 1-14, the prophet visits the Valley of Dry Bones and prophesies they will come alive by God’s command. The African-American song has this origin.

Please write to me again in the course of the week that I may know your more matured views. Pray give me the dimensions of the new track, length of toes especially, the middle toe depth & numbers of toes. I wish also to know the dimensions of the caudal furrow & the dimensions of the stones.

Is it possible that the enigmatic furrow on that slab which you saw here & which I was inclined to attribute to the dragging of wood, a limb or root, may have been caudal? I shall again suggest it narrowly [?] & not perhaps more intelligently. Need we give up the birds? To my eye many, very many of the impressions appear as indubitably ornithic as marks of indubitable living birds make standing in clay or mud, & so said the acute and unprepossessed president [Jeremiah] Day when he first saw your collection many years ago. Has any reptile three toes, has any bird four? Those seven deep tracks in regular sequence, have they not three toes and may they not be birds? Give me the stride between those tracks, the ten great tracks which we have copied from your sheet. I suppose they must be of the same species or at least genus with your newly acquired specimen & with that great track under glass which you saw here & admired.

Dr. Wyman will be your best authority as to the bones⁶⁵⁰ & I will aid you in the expences of more exploration & examination about them.

We expect to leave home on tuesday the 28^h a week from tomorrow and a letter might not reach me after monday the 27^h. I shall be glad to hear from you at St. Louis, after moving, to Dec^r 5, & remain as every your friend

B. Silliman”

EH to BS, box 5, folder 18

“Amherst Oct. 19th 1855

Dear Sir,

The sketch at the bottom will give you some idea of the new slab of tracks which I lately purchased, though by no means accurate. The length of the track is 16 or 17 inches & of the step 3 ft. 3 in. The toes are very broad (2 inches at least) & the whole track looks very much like that of *Brontozoum giganteum* except that it has a small curved toe proceeding nearly at right angles from the heel. The trace of the tail passes directly across at least through other tracks. At the joints, the animal turns somewhat & the trail falls outside of the track. This animal must have been of a quite different genus from the *Brontozoum* of which tracks you took a copy & have a fine specimen in your cabinet of that animal and four thick toes pointing forward. A bird never has so many, though often it has a fourth pointing laterally or backward.

I do not give up the idea that some of our tracks are those of birds. The grand argument for such an opinion still remains untouched: viz the number of phalangeal impressions which corresponds with that of birds alone. The new track does not show these at all although it does look very much like a *Brontozoum* & had I not seen a fourth toe, I should have referred it to that genus. After all however it may turn out that these animals were neither really birds nor reptiles but somewhere between both according to Agassiz’ view & as I have suggested in my descriptions in the *Am. Acad. Transactions*.⁶⁵¹

The longest stride in one of my slabs of *Brontozoum* which you saw is about 4 ft 6 inches. But I have seen some larger.

I have thought that perhaps the name for the new animal that made the traces & the tail out to be *Gigadipus* instead of *Gigadipus* as I have written it. I wish Mr. Dana would alter it if he thinks so.⁶⁵²

I wish that you & Mrs. Silliman (to whom please present my own & Mrs. H’s best regards) may have a pleasant trip to the west. The St. Louis Young Men’s Christian Association are pressing me hard to give my four lectures on the religious leanings of geology. But I do not see how I can: nor will it be necessary if they will attend your lectures. I regret that I must delay my journey to the west till cold weather. I fear it will be too much for me.

I hope soon to bring the fossil bones before Prof. Wyman. A few more fragments have been discovered I learn, but have not seen them.

Most truly & sincerely yours,

Edward Hitchcock

Excuse the burnt corner of this note. I cannot copy it in time. It happened a moment ago after it was written.”

⁶⁵⁰ Harvard’s professor of anatomy Jeffries Wyman (1814-1874).

⁶⁵¹ Hitchcock, “Additional facts respecting the tracks of the *Otozoum moodii* on the liassic sandstone of the Connecticut Valley,” *Proceedings of the American Association for the Advancement of Science, 9th meeting [1855]* (Washington 1856), p. 228.

⁶⁵² Now “*Gigandipus caudatus* Hitchcock.”

BS to EH, box 4, folder 4

“St. Louis Missouri. Octob. [i.e., November] 13, 1855

To Rev^d Ed. Hitchcock,

My dear sir,

I thank you for your kind letter of Octob^r 19 giving me interesting information respecting your important acquisition.

I shall be obliged if any new light should arise from anatomical examination of the fossil bones, if you will give me a notice of it directed to me at Washington House St. Louis, as early as you can.

I think it important that you should come and give those lectures and that they will come just at the right time.

Bishop Hopkins of Vermont is here & last evening gave a lecture before the young men’s Christian association on Modern Geology & “its assumptions.” A clergyman of this city Theo^d William Homer, brother of the missionary, came to see me after the lecture which he attended. I did not.

He says it was vituperative & superficial; he set down half the geologists as infidels, and confined the whole world to six common days, insisting that the work could bear no other signification.

(Dr. Murdock says that if he were to select any Hebrew word which is more appropriate than any other to express time at large it would be that very word yom which is used for days in the 1st Chapt^s of Genesis. I shall not follow the bishop or allude to him but give a strong presentation of the facts in an elementary way.

I have sent you my prospective in which you will see that five lectures are given to the Dynamics & the remainder to the history of life and the general results. Only in the last lecture shall I briefly touch upon the question of time.

This will leave that part of the subject open for you and your views will form a happy conclusion of the matter.

The highest ex-cathedra fulmination will I suppose sway the ultra episcopalians along with him. If he knew of your & my engagement here which must have been the fact, it seems then to have been an indecorum to attempt to forestall the whole subject & to nullify beforehand by authority what cannot be put down by argument, as the matter stands.

The Bishop’s abrupt assault followed by my calm & full exposition of the facts & your closing idea [?] will leave the subject as it ought to be left. You are aware that the finishing of the Ohio & Mississippi Rail Road finishes the land benefit to St. Louis.

From Cleveland to Indianapolis is one day’s ride, about 280 miles, an excellent Hotel (Bates) receives you at Indianapolis & one ride more of about the same length brings you into this city to sleep; the cars from Vincennes are excellent.

Mrs. Silliman unites with me in kindest remembrance to Mrs. Hitchcock & your children. This city is in sorry having buried yesterday & on the Sabbath 25 of its best citizens crushed to death by the late catastrophe, four others were from different places. Three clergymen perished and among them the oldest & most distinguished on this side of the Mississippi, Dr. Bullard whom I knew.⁶⁵³ He was very kind to me 1844 & in that # was several days a guest in my house. A new & splendid church had just been built for him and he had preached in it a week ago yesterday. The last service in it was for his own funeral.

Hoping to hear from you that you are coming, I remain, my dear sir, as ever faithfully your friend,

B. Silliman

I expect to begin to begin tonight but have no great expectations of an audience.”

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania

“Amherst Nov. 23^d 1855

Dear Sir,

I believe that there has been no new development respecting the fossil bones. I showed them to Prof. Wyman who rather thought them reptilian: but he has had no opportunity to study them. I shall send them to him shortly.

Nor has any thing further of importance transpired respecting the tracks of the Gigantipus. Mr. Field has worked hard to get more but says he has removed most of them. I think he has found enough however to get \$100 or 200 out of somebody.

⁶⁵³ Rev. Artemas Bullard (1802-1855), Presbyterian minister of St. Louis, and thirty-three others were killed on Nov. 1, 1855, when a rail bridge collapsed en route from St. Louis to Jefferson City MO, ironically to mark the opening of a new section of the Pacific Railroad.

I wrote the Association at St. Louis that if it were possible for me to give them a few lectures when I had finished at Chicago &, I had no objections though I thought it useless after your course. I fear that I have engaged to give too many already. I have just returned from Newark N.J. where I have given my course of four: but it is hard work. I hope to start for Buffalo Dec. 12th.⁶⁵⁴

I think you take the right course in relation to Bishop Hopkins. What is the use of trying to reason with such a man? Of what value would be the criticism of a man upon the style of # who, as you have ascertained, had never learnt the Greek alphabet?

I have been working very hard for two days in removing very large slabs of footmarks into the new ichnological cabinet. It is a great undertaking & I shall injure or destroy some of the specimens.

I thank you for the program of your Lectures in St. Louis. They must be very instructive & interesting & I doubt not will be fully attended.

I parted with Dr. Bullard & wife in the Alps or rather at Montigny where we spent the sabbath after having been together nearly a week.⁶⁵⁵ The blow is upsetting: but it possibly teaches us how uncertain is life when trusted to railroads. I hope your life & health may be preserved & you have a pleasant return at length to New Haven.

With the best respects of myself and wife to Mrs. Silliman, we remain

Most truly yours,
Edward Hitchcock”

EH to Benjamin Silliman, Jr., box 5, folder 18

“Amherst March 24th 1856

Dear Sir,

I am much indebted for your suggestions as to the nature of some of the small tracks. Prof. Leidy agrees with you as to the crustacean origins of some of them.⁶⁵⁶ I hope you will not object to my using your suggestions in my Report having first stated that only drawings were presented to you.

I have forgotten to pay the Journal of Science for an advertisement about the footmarks. I will attend to it as soon as I ascertain the amount. That was a brilliant speculation. I have not been applied to for tracks to the amount of one dollar. But the Journal has done its duty & shall be paid.

About the middle of next June our Senior Class propose to impose a new name upon the north point of Mount Tom in the south part of Northampton, commanding a view in some respects superior to that from Holyoke.⁶⁵⁷ The class have requested me to write you & Prof. Silliman Jun. to be present. They will mention the Mt. a little after noon & have some speeches inviting the public. Their invitations from abroad are very limited. I hope that you & Prof. S. will come & bring your wives to visit Amherst if your time will permit. There is a wagon road to the summit of the Mt. from Northampton only four miles distant. Will you be kind enough to convey this invitation to your father in law.⁶⁵⁸ & oblige. [sic]

Yours respectfully,
Edward Hitchcock.”

EH to BS, Simon Gratz Collection, Historical Society of Pennsylvania

“Amherst Feb^y 15th 1858

Dear Sir,

It seems so much like old times & so pleasant to receive a letter from you that I cannot but thank you for it & for its expression of kind regard for me & mine which I heartily reciprocate.

As to Cordier’s book, it has been many years out of print⁶⁵⁹ & I have only one copy: but Mr. Graves will find a better account of the subject in more recent works.

⁶⁵⁴ Hitchcock’s lectures at Newark, Chicago, and St. Louis have not been identified.

⁶⁵⁵ For Artemas and Anne Bullard, see Herbert 2008, pp. 108-12, and Herbert 2012, pp. 64-67.

⁶⁵⁶ Joseph Leidy (1823-1891), anatomist and paleontologist at the University of Pennsylvania.

⁶⁵⁷ Mount Nonotuck was named in June, 1856, in a ceremony led by Amherst College’s senior class; 500 were in attendance, including regional notables. In his address, Hitchcock tossed in the air a dozen tiny stones from around the world, to receive the newly named mountain “into fellowship with all the other mountains.” (Hitchcock 1863, *Reminiscences*, p. 248). North of Mount Tom itself, which gives its name to the whole range, Nonotuck consists of three conjoined peaks overlooking Easthampton and Northampton.

⁶⁵⁸ Hitchcock meant simply “father.” James D. Dana was Silliman’s son-in-law.

⁶⁵⁹ Cordier 1828.

What with his theology & his chemistry, my son Charles, I believe, found his hands quite full while in N. Haven. But he felt quite grateful to you for your kind invitations to call upon you. He became greatly attached to N. Haven. Last summer he was engaged in the survey of Vermont⁶⁶⁰ & this winter he is studying theology & helping me arrange & name my Cabinet of Footmarks.

In the last year & a half I have been constantly engaged in making out a Report to the Government of the state on these footmarks. To make the Collection has cost me a great amount of hard work during the last twenty years & to secure the Cabinet & purchase the slabs I have been obliged to beg not less than \$15,000. I felt quite desirous of describing the specimens as well as to name them though I hardly expected to be able to do it at my time of life & with my many infirmities. But Providence has carried me through with the work, & the Plates (60 in number, quarto) are nearly all lithographed.

You may remember that I attached your name to a species of Brontozoum. It is still retained and as I happen to be writing to you I will copy a paragraph from my Report to which I hope you will not object.

'I dedicate this species as a testimony of respect & gratitude to my eminent teacher & friend, Professor Benjamin Silliman L.L.D., whose long life of devotedness to science & distinguished success as well as estimable private character, entitle him to the grateful remembrance of those whom he has taught & encouraged in similar pursuits. I am glad to affix his name to a species the most distinct & common, yet beautiful in the Cabinet. It is especially due to him as probably the first scientific man who adopted my view of the footmarks, and whose great work the American Journal of Science has continued to record work on the above for nearly a quarter of a century.'

I think you told me you had seen a fine specimen of tracks in the possession of Dr. Barratt of Middletown. Most of those are of the B. Sillimanium.⁶⁶¹ That slab is now in the Cabinet & I think the most perfect we have. I have got a fine lithograph of it for my Report.

I feel as if I should never write another book. I have ever been complaining as you know: but during the past year my system has given way more than for ten years before. I am glad to learn that your health continues good & that you have recovered from your lameness. May you yet see many days below before you are called to your reward above!

Mrs. H. joins in special regards to yourself & Mrs. Silliman.

Most truly yours,
Edward Hitchcock"

EH to BS, Simon Gratz Collection, Historical Society of Pennsylvania
"Amherst Feb^y 20th 1858

Dear Sir,

In my reference to your Journal in my dedication of a footmark to you, I did not refer to the age of the work but to the length of time in which it had registered in the history of footmarks, viz., about 25 years. I know that the age of the Journal was 40 years for it stands before me in my study & I have been a subscriber to it from the beginning: but it did not begin to register the history of Ichnology more than 25 years ago because that history had no earlier existence. Yet to prevent all misunderstanding of my language, I have modified it in the manuscript (still in my hands) as follows: 'whose great work, the Am. Jour. Sci. begun 40 years ago, has continued to record the progress of ichnology more than any other work on the globe, for nearly a quarter of a century: that is from the birth of this branch of science.'

I have read Senator Dixon's remarks & think he could not in justice have said less. But whether you will consider his eulogy more creditable than the vituperation of President Buchanan & others, I am in doubt: For in respect to the abuse we receive from some men, we may say with Milton

'By whom to be disprais'd
Were no small praise.'⁶⁶²

I can sympathize with you a little in this matter: for though I have not been abused by name in the Senate, I was one of the 3000 clergymen who threw in a protest.⁶⁶³

⁶⁶⁰ In 1856 Hitchcock was appointed geologist of Vermont, and enlisted sons Edward and Charles, and Albert D. Hager, for the eventual publication of which he was the chief investigator and editor: Hitchcock 1861.

⁶⁶¹ Now *Eubrontes sillimani*.

⁶⁶² Correctly "Of whom ..," from *Paradise regained*, book III, line 56.

⁶⁶³ Silliman had gained notoriety by addressing a protest to President Buchanan for siding with proslavery Missourians in their invasive actions in Kansas. In February 1858, he was defended in the Senate by Connecticut's James Dixon.

Having a proof sheet of what I call a very fine lithograph of the fine Barratt slab of Brontozoum Sillimanium, I send it to you herewith. The Figs. 3 & 4 of the same plate you will recognize, probably a reduced outline of what has been regarded as a human footprint at Middletown: although I have no decided opinion of its nature except that it is not a human footmark.

I thank you much for your kind invitation to me & mine to visit your house. Since your visit here a year or two ago it has been my wish & determination to return it, but my time has been so incessantly occupied that it has not been possible. As to the future my resolutions are good enough but whether I shall be able to execute them is problematical.

Most truly yours,
Edward Hitchcock”

BS to EH, box 4, folder 4
“New Haven March 8, 1858
To Prof (late Pres^l) Hitchcock
My dear sir,

I have not yet thanked you for your kind note of Feb^y 20.

The attention which you have made in the proof sheet regarding the age of the American Journal is quite satisfactory and removes all ambiguity if any existed.

I am not a little pleased that I was, as I believe, and as you have said, the first person who responsibly recognized the correctness of your conclusions regarding the foot tracks in the rocks of the Connecticut river valley, as Buckland was the first in Europe.

I thank you for the beautiful copy you have sent me of the foot tracks in reliefs, copied from the slab which you purchased from Dr. Barratt. It is a precious thing and it could not be in better hands than yours.

You mention Senator Dixon’s remarks. Of course they were gratifying to me who have been twice on trial before that august body—the Senate of the United States—and twice zealously defended, in the affair of the rifles by our Senator, Mr. Foster, and in that of the letter to Buchanan by Mr. Dixon. In a letter of acknowledgements to him especially for the statement he had made of the New Haven overture to President Buchanan, I added however that in the exaltation which he had given to an individual who claimed no other merit than an honest effort to perform his duties in the line of action to which Providence had called him, I thought that some, perhaps many would think he had gone too far:

hear his reply --

‘Allow me to say that the allusion to yourself has called forth from senators & representatives of all parties, as well as from numerous private citizens, by letter and otherwise, warm approbation, as being more than deserved by the distinguished subject of my remarks. I felt that I was taking a great liberty in using your name, and in so public a manner, but I felt also that your position & the public interest justified and required it.’

It is a curious fact that the very man who first asserted the Missouri compromise & battered down that wall of defence is now the champion of the rights of freemen in Kansas.

It must be a great satisfaction to you as one of the 3000 clergymen who stood by the right, that you are now # defended by those who assaulted you. We have godless men now at the head of our affairs. May God preserve us from the results of their machinations!

The great & good man [Rev. Nathaniel W. Taylor] who wrote that searching reply to Mr. Buchanan’s letter lies now at the point of death. Dr. Taylor may not be living when you receive this letter; it would require a geological antiquary to decipher [it]. The president & his abettors seem to me to have no fear of God before their eyes, nor any proper love of man.

As to those so-called footprints at Portland, I visited the place at the time and reported upon them in a Middletown paper that they had nothing to do with man or any organized being, but were the accidental results of a aggregation in the material of the rock. I think I desired the proprietor to send you a paper but perhaps he forgot it.

I have been looking over your late publication in the Smithsonian & see plainly by glancing at the titles, diagrams and illustrations that you have done a great work & thoroughly, I doubt not.⁶⁶⁴ It must have cost you an immense amount of toil, physical & mental, & I think I see the hand of Mrs. Hitchcock & perhaps of your daughter in the beautiful illustrations. You often remind me of Richard Baxter living in an age when wicked men

⁶⁶⁴ Hitchcock 1857.

bore sway, always feeling infirmity of body but with untiring industry & fidelity accomplishing more labor and bringing out finer results than most of your contemporaries.⁶⁶⁵

May you long live to prove that physical infirmity is not inconsistent with great mental efficiency.

Mrs. Silliman unites in kindest remembrance to Mrs. Hitchcock & your daughters, any & all of whom as well as their parents will be welcome at the house of your faithful friend.

B Silliman”

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania

“Amherst Dec. 26th 1859

Dear Sir,

I ask your acceptance of a copy of the second & third edition of my Religion of Geology.

Never till this session of the stereotype plates have I been able to make those references to your labours which I always condemned myself for not making in the first edition, though the omission was not an intentional one. I have tried to do you some justice on pages VII, 46, 66 & 539.⁶⁶⁶

By reference to the additional lecture in this edition you will see that I have become fully satisfied that hot water has played a most important part in the production of granite & trap.⁶⁶⁷ My present views are to a great extent a union of the views of Werner & Hutton. It is interesting to find the supposed conflicting views of such distinguished leaders in science coalescing.

I remain most truly yours,

Edward Hitchcock”

BS to EH, box 4, folder 4

“New Haven, Feb. 2, 1860

My dear sir,

Last evening I had the pleasure to receive a copy of the new edition of your Religion of Geology &c, for which please to accept my sincere thanks.

After the severe shock to your health some time since, it is very agreeable to your numerous friends to observe such proofs of restored power, physical & mental, and they be long continued.

In my retirement at home after finishing the duties of the day—and every day brings its quota—and after the retirement of any friends who may have called in the evening, I sit down with my good wife generally about 9, able to read aloud some interesting and instructive work. An hour & a half and more rarely two hours thus redeemed enables us to master miscellaneous works which otherwise might wait a long time on our table.

We are just now engaged in reading *The Life & Times of Frederick Perthes* from the German, a highly instructive book in the literary, religious & political events & opinions of the era, nearly the first half of this century.⁶⁶⁸ We have finished 300 pp. out of 466, and as soon as we have done with Perthes, we shall take up your work & read it through in concert, and I doubt not with pleasure & profit.

I do not believe that we shall be inclined to follow the example of the London Quarterly which when Davy’s work on *Elementary Chemistry* appeared, with a dedication to Judy Davy ‘who had made the time that passed while he was writing his book the happiest of his whole life’ -- the pert reviewer said that there was no occasion to say that it was written during honey moon, as that was evident from the inaccuracies.

Such evidence we shall not find in your work but on the contrary a conjoined tribute to science, religion & domestic happiness. Our affectionate regards to the good lady who so well deserves the place you have given her and to her daughters also, who with mother & all children owe us a visit & you with them.

My kind regards also to your sons & believe me as ever your faithful friend,

B Silliman

⁶⁶⁵ Richard Baxter (1615-1691) was an English Puritan theologian.

⁶⁶⁶ There Hitchcock places Silliman among those who state that between Genesis’s “in the beginning” and the first demiurgic days, there was a period of indefinite length into which many pre-adamic events took place.

⁶⁶⁷ In “Lecture 15,” added for this edition, Hitchcock wrote (p. 515) that no recent geological discoveries have “thrown doubt” on the fact that “processes are now going on around us capable of producing nearly all the known varieties of rock, with the aid of water and heat; nor that water and heat have been the grand agents of all geological changes.” Granite and trap are not mentioned, but implied.

⁶⁶⁸ Clemens Theodor Perthes (1809-1867), *Memoirs of Frederick Perthes, or, literary, religious and political life in Germany 1789-1843* (Edinburgh 1857).

I have just received a letter from a clergyman in Ohio enquiring whether I have ever taught that all fossils, from shells to saurians, were created in the rocks just as we find them! A lecturer on spiritualism had quoted me to that aspect at Edmt. Portage [?] ##. I sent him along with a letter, my introduction to the Am. Ed. of Mantell's Wonders of Geology. The lecturer seems to have had revelations from # spirits."

EH to BS. Simon Gratz Collection, Historical Society of Pennsylvania
"Amherst Feb^y 6th 1860

Dear Sir,

I drop this note to try to save you & Mrs. Silliman from vexation & disappointment. I conclude from your letter that you imagine all the book I sent you to be essentially new whereas all the Lectures except the last are the same as when presented in 1852. Nearly every stereotype plate remains unaltered & I ought to have mentioned this before: because it explains the reason why I could do no more than crowd in your name & that of Prof. Dana among your illustrious confreres & could not amplify as I might do if writing a new book. The last lecture is the only part whose perusal will be at all worthy of your attention.

I rejoice that you have so much to comfort & solace your declining years & especially that Providence after removing your first most amiable wife directed you to another so admirably adapted to sympathize with & cheer you in the closing years of your life. There are some men of so much buoyancy of spirits that they can be cheered in old age without a wife. I lately got a letter from Prof. Sedgwick who says 'he is well advanced in his 75th year' & in very feeble health, but was on his way to the British Association & says 'if I can hold up my head at Aberdeen, I hope after long silence to give them a paper on some gigantic dislocations & anomalous curvatures in Cumberland.' He is a bachelor. But with such a temperament as mine, the sympathy of a wife seems to me nearly as essential in my old age as the vital air. Providence had indeed be very kind to me in this respect as well as to you. We thank you for your kind intimation that we owe you a visit. We have long felt a strong desire to pay it: but for the most part of late I am so infirm that I rarely venture out of town even as far as East Hampton to see my son. The chief difficulty seems to be in the lungs though the digestive organs are not less out of tune. I still continue to use my pen partly to bring up old works & partly to prevent the mind's turning inward upon itself, or rather upon my infirmities & ailments. As I am situated, I have little of the solace which you experience from the calls of scientific & other friends & I feel greatly the want of it.

But I am showing you that I have one mark of old age about me: garrulity. I close then by offering the kind regards of myself & family to yourself & Mrs. S., & remain as ever yours &c,
Edward Hitchcock"

EH to BS, box 5, folder 18
"Amherst May 7th 1863

Dear Sir,

When I opened your letter my eyes fell first upon the photograph & it is so very perfect & gives the expression of your face so exactly like what it was when more than forty years ago I first heard you lecture & a hundred times afterwards that a crowd of reminiscences came over me and I had quite a crying spell before reading the letter. This shows the weakness of my nerves, but it also shows how powerful was the influence of your eloquence & your kindness upon me in those early days when I was bashful & uncultivated, poor & without scientific friends. Certain it is that your instructions & encouragement & example have had more influence upon me to make me what I have been than those of any other man & if I have not been grateful, God forgive me!

We have both, as you say, had interesting fields of labour, yours much the widest & most important: mine narrower & rougher but still opening opportunities for doing good. I thank God for it & only lament that it has been so poorly cultivated. How cheerful it is to know that we have the righteousness of another to depend upon when we come into judgment

I rejoice to hear of your continued health & comfort in your advanced years & surrounded as I believe you are by most of your children. Most of my children too are in Amherst at present & it is a great blessing. But for the last two or three years my health has been giving way most seriously & the last winter has been one of constant & intense suffering. I am reduced almost to a skeleton with a severe cough, great weakness & almost unremitted pain equal to that of colic or dysentery in the alimentary canal. I have thought the scene must close before now but nature has struggled manfully and if I live till May 24th I shall be three score & ten, a period I never hoped to reach.

Though feeble, God has enabled me to do some things during the winter which I regard with much interest. In the first place several friends of science gave me \$1200 for the purchase of a larger addition to the cabinet of footmarks & they are displayed on the walls of a new room which they completely cover. Among them

I found specimens which have led to some new & important conclusions respecting the footmarks, an abstract of which I send today to Prof. Dana for the Journal.⁶⁶⁹

Another enterprise in which I was engaged was to go to our Legislature & try to persuade them to give us money for the natural History Department. I went three times to Boston to appear before Committees though obliged to have my wife accompany me to take care of me. But succeeded in obtaining a small sum (\$2500) which I consider quite a triumph. Now I think my work is done & little remains but to die. Pray for me that I may have strength in the final conflict.

Poor Mrs. H. has now been for seven or eight weeks very low with pneumonia: but we hope she is gradually improving.⁶⁷⁰ She as well as my daughters & sons appreciate your kind remembrances & that of Mrs. H. [i.e., S.] & I gratefully reciprocate it.

My sons have just got a fine Gorilla stuffed & mounted with its skeleton suspended by its side in the Cabinet. Following the fashion, the animal has been down to the Picture Gallery for its photograph & I ask your acceptance of the carte de visite. It is represented as doubling up the gun of the hunter whom it had killed as related by Dr. Chandler.

Adieux! Most affectionately yours, Ed. Hitchcock.”

[EH Jr. to BS. Simon Gratz Collection, Historical Society of Pennsylvania
June 1, 1863:

“. . . Our dear Mother was taken from us last Tuesday evening. . . . Father has been very low, & still is quite feeble. For the past two months he has been perceptibly failing . . . (bronchitis and ‘slight attacks of pneumonia’). But the severe shock of Mother’s death rather revived him than had the depressing effect which we feared, & he certainly is much better.” Doesn’t weight more than 100 lbs; probably won’t live long.]

EH to BS, box 5, folder 18

“Amherst Aug. 26th 1863

Dear Sir,

This will be handed to you by my youngest daughter Emily who is spending some time with friends in N. Haven & I told her it did not seem improper that she should call & pay her respects to you and Mrs. S. on my account, especially if her special friend Mr. Corbett, a young Episcopal clergyman, will call with her. If you had daughters at home it might be more proper for me to indicate the place where Emily is staying: but she ought not to expect that you & Mrs. S. should call on her.

I still linger on the shores of time, balancing as it were between life & death and suffering intensely. Still God mingles many mercies in the bitter cup & allows me to accomplish several things which I had never hoped to do. I have been able for instance to correct all the proof sheets of a work of 400 pages which I wrote a year or two ago, entitled Reminiscences of Amherst College but which I expected to leave unpublished. The work is a good deal biographical & autobiographical but is intended mainly to give a history of Amherst College up to the present time. I have given a geological map of the region around the College & three views of the College at different periods.

I was greatly indebted to you for your last kind letter of sympathy & condolence & intended to answer it but my strength would not allow. Many debts of this kind must remain unpaid till I enter if I ever do the house not made with hands, eternal in the heavens. God grant that in such spiritual bodies, without sin, we may hold everlasting communion!

Sincerely & affectionately yours,
Edward Hitchcock”

⁶⁶⁹ Hitchcock 1863, “New facts.”

⁶⁷⁰ Orra White Hitchcock died on May 26, 1863, aged 67.

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