

Deep Mapping in Edward Hitchcock's Geology and Emily Dickinson's Poetry

Joan R. Wry

ABSTRACT

The vernacular of deep mapping provides a valuable resource for comparing Edward Hitchcock's geology textbooks — particularly Elementary Geology — with select geology-based poems by Emily Dickinson. Although Dickinson's poems that reveal a clear understanding of nineteenth-century science (especially geological findings) have already been critically analyzed by scholars such as Richard Sewall, Hiroko Uno, and Robin Peel, Dickinson's verse has not yet been assessed from the vantage point of the complex layerings of literary deep mapping. Moreover, Dickinson's poetic explorations of distinct timelines and phenomena in both human and natural history can be aligned in many instances not only with the language of Hitchcock's textbooks, but also with the drawings, maps, charts, and cultural contexts embedded in these volumes. The language, imagery, inquiries and conjectures in poems by Dickinson that are explicated in this essay all have clear (as well as more nuanced) ties to Hitchcock's Geology. My study proposes that even with their different genres and diverse authorial intentions, both Hitchcock and Dickinson engage in similar rich and multivalent approaches to what is clearly an incipient version of modern deep mapping.

“TO FILL A GAP / INSERT THE THING THAT CAUSED IT —”, EMILY Dickinson affirms in poem Fr647A, for “You cannot solder an Abyss / With Air —” (1–2, 5–6)¹. In a number of Dickinson's poems, the “things” that fill gaps are solid, impermeable and often geologic in origin. And in some measure, poetic process (at least in Fr647A) can be seen in light of the nineteenth-century process of “solder[ing]”, a widespread method of uniting similar or disparate objects using ores and mineral deposits, especially

1. Citations to Dickinson's poems are to FRANKLIN 1998. The transcriptions provided here are of the fascicle or “record” version of the poems, unless otherwise noted.

lead ore, found in the earth's crust.² Writing in the age of Emersonian transparency — when the “true poet” was marked by the ability to transcend opacity and “turn the world to glass” (EMERSON 1844, 456) — Dickinson instead often seems to generate visionary insights and ontological convictions through opaque images and “adamant” mediums. Even the void and vacancy of “the Abyss” can perhaps be counterbalanced by the mind's attempts to think through the limitations of time and mortality; as Dickinson states in Fr1397A, the stone certainty of “eternity” is “The only adamant Estate / In all Identity —” (3–4). Known for their complexity of disparate layers and timelines, deep maps can be understood through this same analogy of soldering; they uncover and unite the earth's varied substances (including ores and minerals), with the many stories embedded within them over time. Through a wide variety of narrative forms, deep maps present the “multiple histories of place, those cross-sectional stories of natural and human history as traced through eons and generations”; they “engage in the artful braiding of deep past, scientific knowledge, cultural history, and personal participation in a spatial milieu” (MAHER 2014, 10).

Long before the vernacular of deep mapping was coined, Edward Hitchcock, close friend of the Dickinson family and long-time geology professor and college president at Amherst, offered a similar complexity of layers (addressing deep past, scientific knowledge, and personal and cultural history) in his textbooks. Dickinson not only knew Hitchcock's various mappings of the world's geology, but she also mined his narrative forms for their geologic diction and phrasings, and she used this exact language in a number of her poems. Hitchcock's textbook, *Elementary Geology*, was assigned reading for Dickinson at the Amherst Academy in 1842, but the many references to the world's mountain ranges, volcanoes, rocks and minerals in her poems (as well as the processes that formed them) suggest that her interest in geology was deep and abiding.³ My essay proposes that Dick-

2. The Geoscience News and Information website *Geology.com* notes that “prior to the early 1900s, lead was used in the United States primarily in ammunition, burial vault liners, ceramic glazes, leaded glass and crystal” and in the soldering processes to seal or repair various objects.
3. Richard Sewall was perhaps the first critic to study Dickinson in the context of her scientific education, and his widely quoted recognition of Dickinson's deep understanding of various sciences bears repeating: “[. . .] her poems show a knowledge of chemical process, of botanic and especially geologic lore far beyond the usual nature poet's stock in trade. There are more earthquakes and volcanoes in her poems — phenomena which were central in all geological inquiry, especially Hitchcock's — than in the poetry of Keats, Emerson, Browning, and Shelley combined” (1974, 345).

inson understood the incipient technique of deep mapping that Edward Hitchcock and other nineteenth-century geologists embedded into their texts, and she engaged in a similar process in select geological poems that reflect — with “artful braiding” (MAHER 2014, 10) and skillful soldering — her own unique inquiries and perceptions of both human and natural history.

Deep mapping in the nineteenth century was in many ways a natural response to the cultural fascination with what Robert Macfarlane calls the “dramatic hidden past of the earth” (2004, 44), now more fully understood through Hitchcock’s texts, published between 1840 and 1861, as well as the earlier work of master geologist Charles Lyell, whose contributions are widely acknowledged in Hitchcock’s *Elementary Geology*. Lyell’s three volume *Principles of Geology*, published between 1830 and 1833, first ignited widespread interest in new discoveries in geology for a non-scientific audience; in many respects his approach provided the narrative model for nineteenth-century deep mapping, one followed by the “dozens of popular geological works [including Hitchcock’s] which soon afterwards sought to emulate its success” (MACFARLANE 2004, 44).⁴ Lyell’s narratives deepened the cultural awareness of time; they made “irrefutably wondrous — and terrifying — the age of the earth: its inexpressible antiquity” (MACFARLANE 2004, 44). “Lyell’s brilliance lay primarily in his marshaling of detail”: as Macfarlane notes, “He won over his audience with a combination of irresistibly accumulating facts — in this respect his writing resembled the processes it was describing — and illuminating anecdotes” (2004, 37). Edward Hitchcock used a similar approach in his explication of world geology, but he added an expressly regional emphasis to the discourse, weaving in inter-related stories, drawings and anecdotes from New England regions — especially western Massachusetts — to explain formations above and beneath the earth’s crust: graphic granite in Goshen; trap rocks from Titan’s Pier at the foot of Mount Holyoke; fossil plants from a coal mine in Mansfield. Readers of Hitchcock’s texts — including students at Amherst College and Amherst Academy — were not limited to text-based research for their own greater understanding of geological phenomena (even though these deep maps included a rich layering of scientific data, stories, anecdotes, and histories, as well as multiple drawings, charts, and illustrations), but in

4. As Macfarlane notes, “A late developer among the sciences, during the nineteenth century geology rushed on precociously fast, naming and labeling as time unrolled further and further behind it. Popular geology handbooks proliferated. [. . .] Everyone was made privy to the secrets of the earth’s past” (2004, 53).

many cases they could also, if desired, be eye-witnesses to the phenomena described.

But even with its decided regional emphasis, Hitchcock's *Elementary Geology* begins with the expected foundational elements of "A General Account of the Constitution and Structure of the Earth", the title of Section I in all editions of the text.⁵ The first definition found in this opening section addresses "constitution" by noting that "Geology is the history of the mineral masses that compose the earth, and of the organic remains which they contain" (1844, 13); a page later, Hitchcock provides a broad assessment of "structure", noting that "[t]he surface of the earth, as well beneath the ocean as on dry land, is elevated into ridges and insulated peaks, with intervening vallies [*sic*] and plains. [. . .] [T]he highest mountains are about 28,000 feet above the ocean level" (1844, 14). The materially massive "elevated ridges" and "insulated peaks" predictably became a pronounced focus of study in nineteenth-century geology; as Robert Macfarlane notes, "After the 1820's [. . .] it was realized by increasing numbers of people that the mountains provided a venue where it was possible to browse the archives of the earth — the 'great stone book', as it became called" (2004, 49).

Dickinson's poems with mountain references mostly address higher peaks found outside of her native New England, and in two notable examples, Fr108A and Fr129A–B, "the great stone book" of the igneous Alps provides a venue for "brow[sing] the archives of the earth" (MACFARLANE 2004, 49). "All the older unstratified rocks, as granite, syenite, porphyry, and greenstone, are found in the Alps", Hitchcock notes in *Elementary Geology* (1844, 310); the Alps are clearly a massive stone paradigm for the study of geology. In poems Fr108A and Fr129A–B, however, Dickinson's deep map solderings include a pronounced focus on human and cultural history instead of geological history, although her inspiration for both poems may have included non-scientific stories, anecdotes and other forms of deep mapping provided by Edward Hitchcock. In Fr108A, Dickinson admits that she is describing alpine vistas "In lands I never saw", but she may well have been influenced by accounts of the lands that Edward Hitchcock and his wife Orra *did* see in their well-documented trip to Europe in 1850, where they were most memorably affected by their experiences in the Swiss Alps. As Robert L. Herbert suggests, "In Switzerland, Orra and Edward were

5. Originally published in 1840, *Elementary Geology* went through a total of 31 print editions; the 3rd edition (1842) was the one used by Emily Dickinson at Amherst Academy; it was also the edition owned and signed by Edward Dickinson that was found in the Dickinson Homestead.

particularly drawn to the mountains. A life-long devotion to landscape attached this couple closely, she as an artist who had drawn the river and slopes of the Connecticut River Valley, he, as a geologist with a passionate love of landscape for itself and divine revelation" (2008, 100). Edward Hitchcock made several references to "mountaintop sublimity" in his texts and lectures before and after the 1850 trip to Europe, and the language he uses in one vivid reference from *Religion and Geology*, "nature everywhere is fitted up in a lavish manner with all the elements of the sublime and the beautiful" (1857, 157), suggests a familiarity with Edmund Burke's then still popular late eighteenth-century analytic of the sublime.⁶ Orra Hitchcock's travel diary of her 1850 trip to Europe includes similar rapturous references to alpine sublimity, descriptions she may well have shared in conversations with the Dickinson family: "Alps on Alps in wild array, enough to satisfy even the most romantic mind. [. . .] Some two or three hundred people collected & waited for the mist to roll away, nor did we wait in vain, for it soon passed by & a most magnificent & glorious prospect was presented which exceeded anything I had ever seen or expected to see again" (ed. HERBERT 2008 101, 106). The sunrise descriptions are echoed in nuanced ways in a playful reference in one of Dickinson's letters: "I saw the sunrise on the Alps since I saw you", she reports matter-of-factly in November 1866 (L321); "to shut our eyes is Travel", she announces in a later missive composed in 1870 (L354). Various local reports of the Hitchcock's experiences in the Alps may have been very familiar to Dickinson, but she also probably drew from a range of cultural associations for her alpine poems, as she lived during what William Howarth refers to as "the great era of mountain climbing in Europe, when the Alps swarmed every summer with athletic tourists" who hoped to see breathtaking vistas and possibly experience transcendence in thin mountain air (1983, 7). Dickinson, like her contemporaries Thoreau and Emerson, may have read about the climbs of early Swiss naturalists like Gessner and de Saussure, and she had in her father's library John Ruskin's descriptions of alpine scenery in *Modern Painters*, especially the two famous chapters on "Mountain Gloom" and "Mountain Glory". Both Fr108A and Fr129A–B were most likely composed in the decade following the Hitchcocks' return from Europe, and Dickinson would have also seen Orra Hitchcock's wood engraving of the "View of the Glacier of Viesch" when she was a young student at Amherst Academy, as it was included in

6. Edmund Burke's *A Philosophical Enquiry into the Origin of our Ideas of the Sublime and the Beautiful* was first published in 1757.

the second (1841) edition of Edward Hitchcock's *Elementary Geology*, and in every edition thereafter.

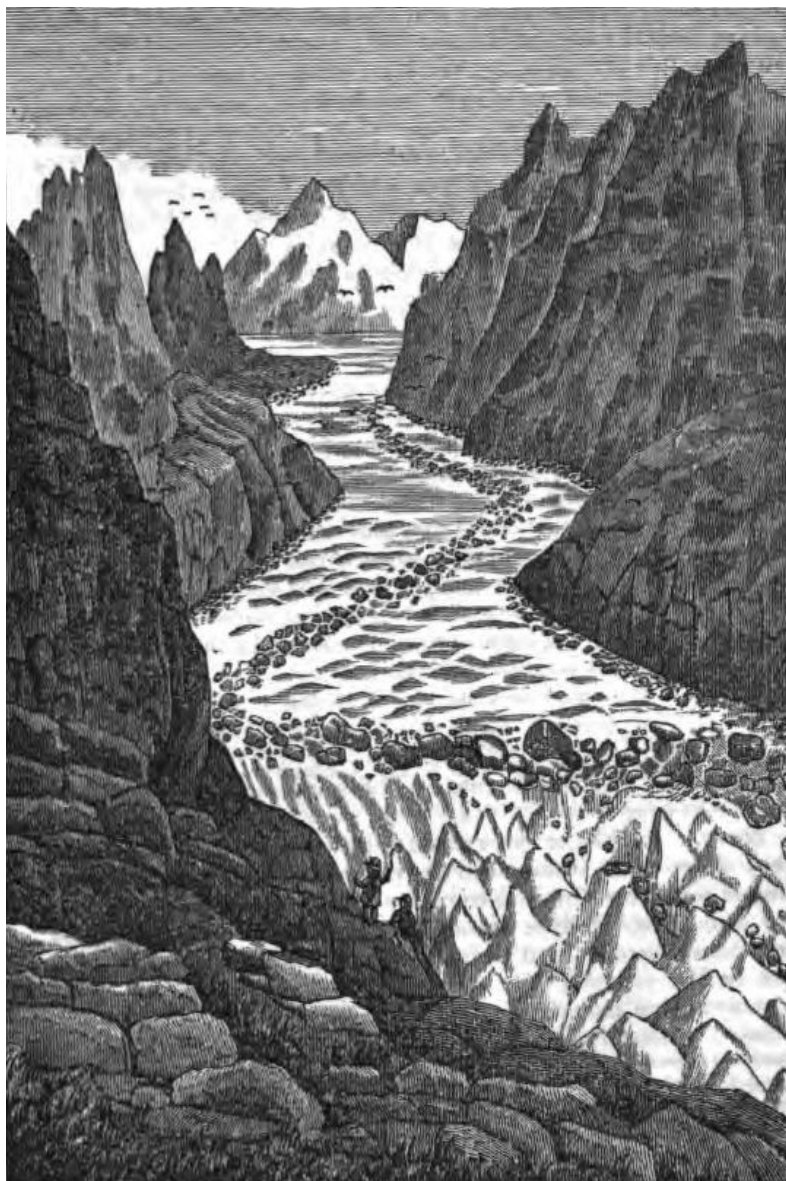


Figure 1. Orra Hitchcock, “View of the Glacier of Viesch”, in *Elementary Geology*, 1841.

This engraving, with its provocative glimpse of gleaming mountains rising literally in a “country beyond”, may have been — at least in part — an inspiration for Dickinson’s poem Fr129B:

Our lives are Swiss –
So still – so Cool –
Till some odd afternoon
The Alps neglect their Curtains
And we look farther on! (1–5)

The next stanza features a vivid exclamation and emotional intensification: “*Italy* stands on the other side!” (6), almost as if the speaker of the poem has visually “crossed over” in a transformative rite of passage. The precision of this specific, even if imagined, transition stands in contrast to the imprecision of Dickinson’s reliance on cultural stereotyping, for the poem juxtaposes well-known geographic and cultural contrasts between countries separated by the Alps, making use of then popular associations for “cool” and reasoned Switzerland and warm and sensuous Italy.⁷ And at the line of demarcation stand the “solemn, siren” Alps, liminally alluring and fascinating, but also forbidding, “like a guard between” the two contrasting cultural paradigms:

While like a guard between –
The solemn Alps –
The siren Alps
Forever intervene! (6–9)

7. See PATTERSON (1979) and EBERWEIN (1996) for a more complete explication of these geographic and cultural contrasts. I am indebted to Karen Sanchez-Eppler’s observation on the “imprecision” of cultural stereotyping in this poem, a comment she made to me in a workshoping session at the 2015 Dickinson Critical Institute in Amherst.

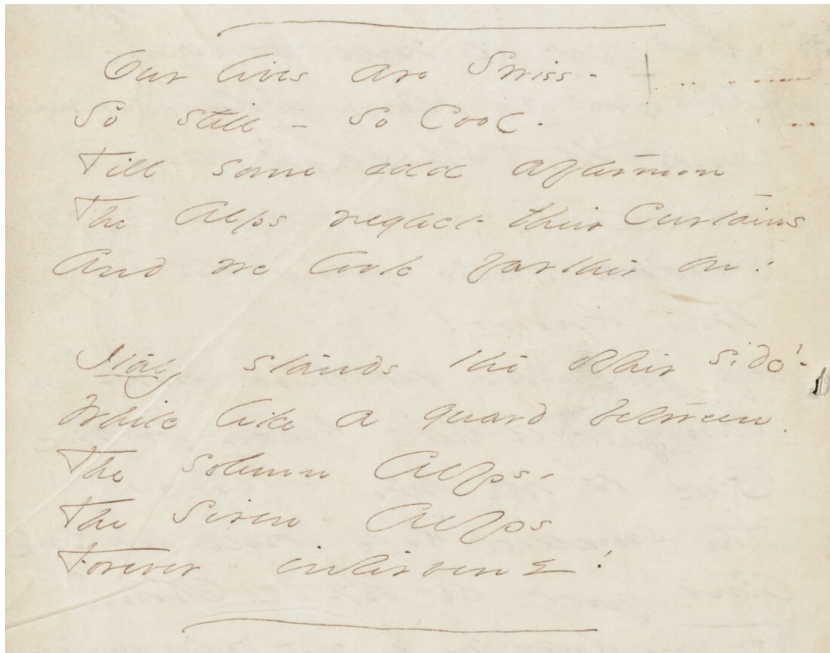


Figure 2. Emily Dickinson, “Our lives are Swiss –” (H 12), Fascicle 6, about late 1859. Reproduced courtesy of the Houghton Library, Harvard University.

Dickinson’s Lexicon (WEBSTER’S DICTIONARY, 1844) lists the word “solemn” as “grave, serious”, but also “sentient” and “sacred”. In this sense, the rare experience of being able to “look farther on” from Switzerland into Italy in spite of the “intervening” Alps is a version of sublime experience, the visionary passage from the “still” and “cool” into unveiled and unanticipated enchantment.

In poem Fr108A, “In lands I never saw – they say”, Dickinson gives another insight into her understanding of alpine sublimity in lines that assert both the “Immortality” of the Alps as well as a more familiar, even playful, personification of their physical features. In this poem the stone surfaces of the mountain peaks are instead snow-capped “Bonnetts” that touch the celestial “firmament”, while their “sandals” touch the town that lies literally at their feet; these descriptors are tactile and engaging in one sense, while also affirming of a link between the “immortal, sacred, everlasting place” — the “firmament” of Dickinson’s Lexicon — and a multitude of daisies in the town at the base of the mountain, where mortals live their lives beneath massive “Immortal” towers of stone:

In lands I never saw – they say
Immortal Alps look down –
Whose Bonnets touch the firmament –
Whose sandals touch the town –

Meek at whose everlasting feet
A myriad Daisy play –
Which, Sir, are you, and which am I –
Upon an August day?

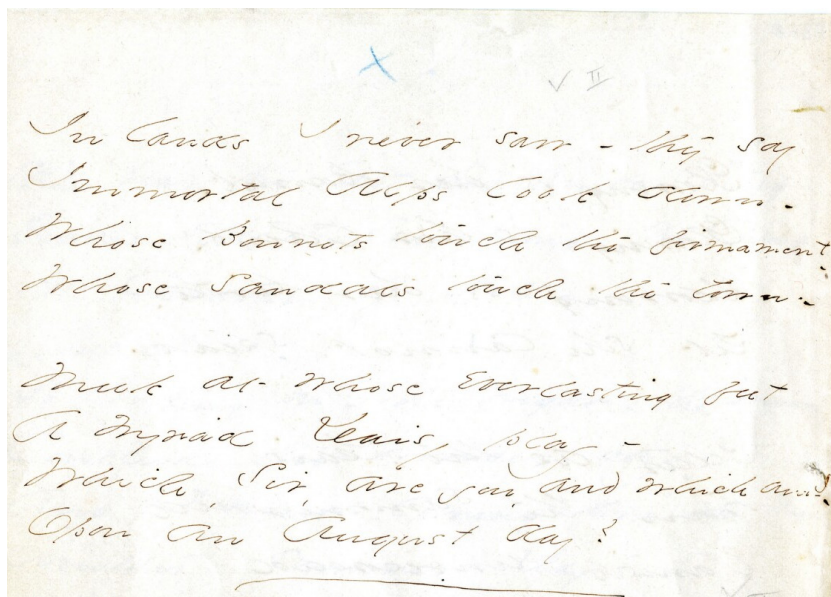


Figure 3. Emily Dickinson, “In lands I never saw – they say” (A 83-7/8), Fascicle 5, about 1859. Reproduced courtesy of the Amherst College Archives & Special Collections.

Clearly, Dickinson includes the deep map layer of a general cultural knowledge with the phrase “they say” in line 1, but she also invites a beguiling ambiguity in the closing lines of the poem by speculating on where (and with whom) “immortal” identity is assigned. Just as Shelley never “saw” Mont Blanc through the clouds when he contemplated its existence from the bridge over the River Arve, Dickinson has never seen “the lands” of

the Alps; her rhetorical question in the final lines of Fr108A echoes (albeit slantly) the challenging and ambiguous inquiry in the closing lines of Shelley's *Mont Blanc*:

And what were thou, and earth, and stars, and sea,
If to the human mind's imaginings
Silence and solitude were vacancy? (V; l. 16–18)

Writers in the nineteenth century thought the Alps in particular had the best potential to be a locus of sublime experience; their overwhelming mass, incomprehensible heights (for those viewing from their base) and capacity to produce “astonishment [. . .] in its highest degree” from multiple vantage points (to quote from Edmund Burke's *Enquiry*), made them “Immortal” in ways that Dickinson seems to be considering as well as challenging.⁸ The Alps are enduring and sublime within a conventional nineteenth-century cultural context for the Hitchcocks on their European tour, but Dickinson's poem Fr108A also acknowledges that context (in a far less conventional way) with its description of lands she “never saw” but instead may have envisioned — not only through an accessible cultural knowledge, but also, to borrow Shelley's phrasing, more profoundly through the power of her “mind's imaginings” (17).

Notwithstanding Dickinson's subtle references to alpine “Immortality” in these two examples, the mountain peaks of the Alps are addressed far less as a topic in her poems than are the world's volcanoes, both active and extinct. More than any other geologic feature, Dickinson's poetic deep mappings of volcanoes synthesize and solder a wealth of disparate associations; her poems engage in what Randall Roorda would characterize as a broad “sedimentation of impressions” that present a complex layering of place (2001, 259). Dickinson's volcano poems have been widely studied, but a specific focus on these poems in light of Edward Hitchcock's geologic diction and mapping is less fully realized, with the exception of Hiroko Uno's close readings of select volcano poems in her essay “Geology in Emily

8. The quote from Burke's *Enquiry* addresses astonishment not only as “the effect of the sublime in its highest degree”, but also as “that state of the soul, in which all its motions are suspended [with] the mind so entirely filled with its object, that it cannot entertain any other” (2008, 53). Dickinson's version of alpine sublimity in this poem — with its questioning of assigned “immortal[ity]” in the closing lines of the poem — seems to temper astonishment with coy bemusement.

Dickinson's Poetry".⁹ Examples of deep map crossover between Hitchcock's geology and Dickinson's volcanic poetry are evident in a comparative study of diction, but skillful deep mapping is not limited to language-based analysis. A once vividly colored classroom chart drawn by Orra Hitchcock for Edward's geology lectures provides a unique insight into the deep mapping inspiration of Orra Hitchcock's artistry that became a foundational aspect of her husband's work. Tekla Harms's article on "The Hitchcock's Classroom Charts" points out that "it is difficult to appreciate how provocative *Sectional View of the Crust of the Earth* (cat. 76) would have been for nineteenth-century Amherst students, prompting them to see the earth as an isolated body and challenging them to consider its character deep beneath the sphere of human habitation" (2011, 53). The illustration was most likely intended for Edward Hitchcock's lecture on volcanic action and the internal temperature of the earth; the description in *Elementary Geology* states that as "all of the interior of the earth, except a crust from 50–100 miles thick, is at present in a state of fusion" (1844, 250). Moreover, the note for the figure of the earth's cross-section included in this passage (a simplified version of Orra Hitchcock's more detailed chart) explains that the circular drawing "is intended to represent the proportion of melted and unmelted matter in the earth" (1844, 250). Although the inks of the original classroom chart drawing for the molten interior of the earth have undoubtedly faded over time, Harms points out that Orra Hitchcock's illustration "represents this realm in pink and schematically indicates volcanoes arising from beneath the crust" (2011, 53). The twelve tiny plumes of fire erupting from the darkened outline of the earth's crust — with each plume ascending from an inverted cone protruding from the molten pink interior — are difficult to discern in a photograph of the illustration, but the effect for an eye-witness viewer (like Dickinson and her fellow Amherst Academy students) must have been memorable. As Harms notes, "We now know the crust of to be even thinner and the mantle hot but solid; nevertheless the intellectual impact of this view of the earth, demonstrating the

9. For a selection of critical responses to Dickinson's volcano poems, see, for example, SEWALL 1974, RICH 1976, ORSINI 2016, WHITE 1992, PEEL 2010, BRANTLEY 2013, SIELKE 1996 and UNO 2001. Peel and Uno both acknowledge the extensive influence of Hitchcock's geology in the volcano poems, but only Uno considers Hitchcock's diction within the context of specific poems; see pages 4–15 in "Geology in Emily Dickinson's Poetry" for specific examples, particularly in poems Fr165A and Fr517A.

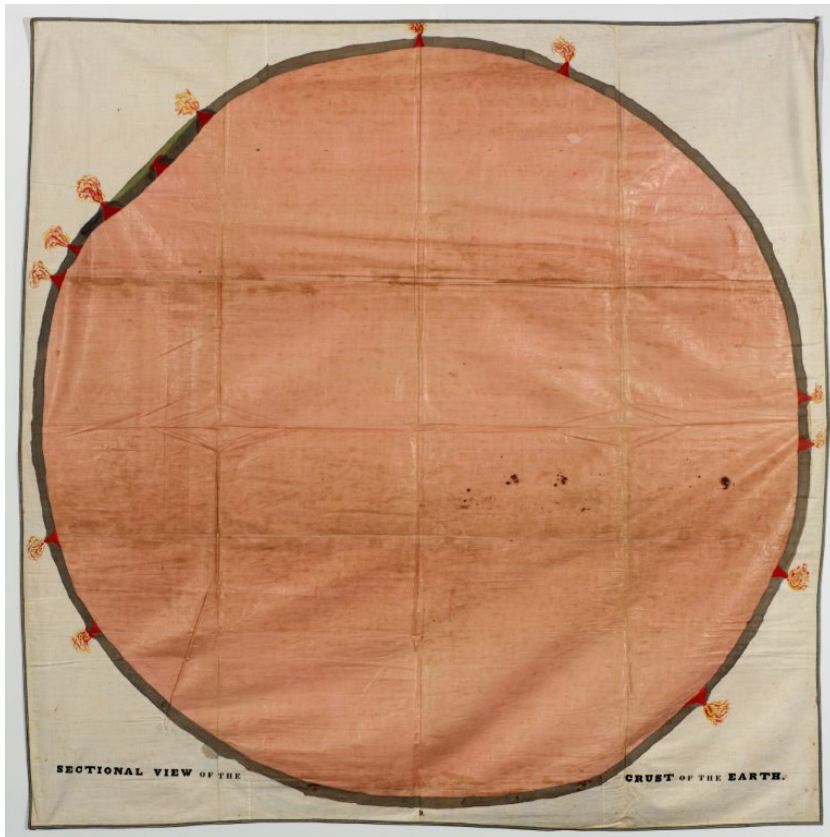


Figure 4. Orra Hitchcock, *Sectional View of the Earth's Crust*. Illustration for Edward Hitchcock's classroom charts at Amherst College. Reproduced courtesy of the Amherst College Archives & Special Collections.

insignificant scale of the crust that supports life and civilization remains undiminished to this day" (2011, 53).

Dickinson's cryptic reference to the "projects pink" of the "reticent volcano" in Fr1776[A] may have an oblique tie to Orra Hitchcock's color scheme for her deep-mapping classroom charts; another chart (cat. 75) features "veins of lava" in elongated pink fissures beneath the surface of Etna.¹⁰ The "projects pink" of Fr1776[A] are secretive and mysterious; they

10. The MS for this poem has been lost, and no date has been assigned to the poem. R. W. Franklin's printed text in *Poems* (1998) is based on a transcript made by

are part of a plan that never slumbers and is explicitly not shared in confidence with human beings:

The reticent volcano keeps
His never slumbering plan;
Confided are his projects pink
To no precarious man. (1–4)

But the project or plan of a volcano is not simply to erupt (and destroy), but also, as emphatically expressed in Hitchcock's *Elementary Geology*, to create new geological formations: "Volcanic agency has been at work from the earliest periods of the world's history; producing all the forms and phenomena of the unstratified rocks, from granite to the most recent lava. [. . .] History abounds with examples of new islands rising out of the sea by volcanic action. [. . .] Very many large islands appear to be wholly, or almost entirely the result of volcanic action" (1844, 225, 231). "[P]rojects pink" are newborn and newly formed (but they are also fluid and molten "project[ion]s", as in Orin Hitchcock's charts), and even though volcanoes appear to slumber when they are not erupting, their "plan" or purpose never does. Hitchcock's *Elementary Geology* offers multiple accounts of volcanic vents that "have been constantly active since they were first discovered. They always contain lava in a state of ebullition; and vapors and gasses are constantly escaping" (1844, 232). The second stanza of Fr1776[A] ponders the secretive nature of this creative act in lines 5 and 6 ("If nature will not tell the tale / Jehovah told to her"), as well as our human dilemma — and "precarious" estrangement — in not fully sharing in nature's confidences in lines 7 and 8 ("Can human nature not proceed / Without a listener?"). The poem concludes cryptically with a reference to "Immortality" as the "only secret neighbors keep" (11–12), but as Hitchcock reminds us in his text, the "seat of volcanic power" is both deep *and* mysterious. "Were not the power deeply seated", Hitchcock conjectures, "volcanos would become exhausted; as they sometimes throw out more matter at a single eruption, than the whole mountain melted down could supply" (1844, 234).

Mabel Todd (A 1896 PC, 27). The punctuation is almost certainly Todd's rather than Dickinson's.

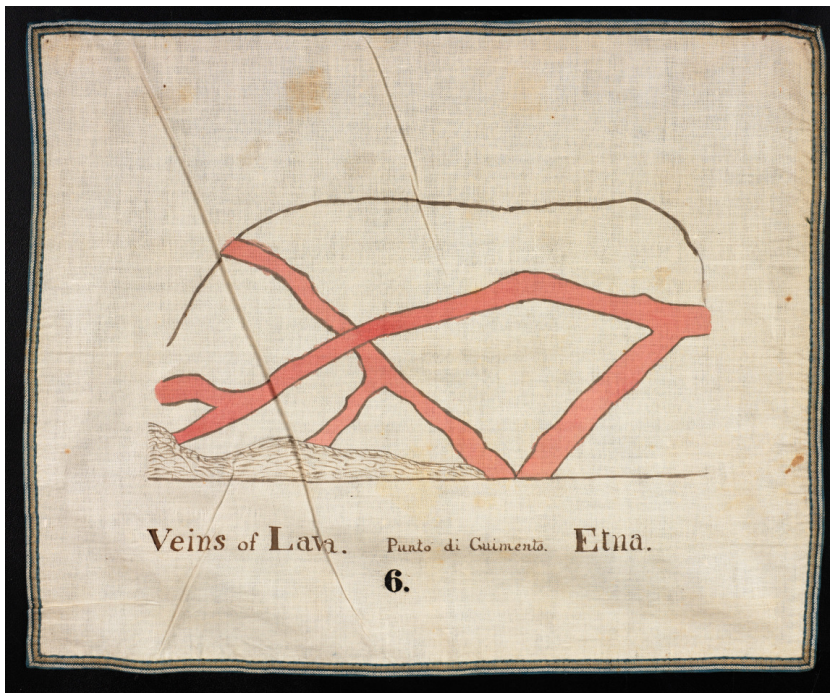


Figure 5. Orra Hitchcock, *Veins of Lava*, Punto di Cuimento, Mount Etna, Italy. Illustration for Edward Hitchcock's classroom charts at Amherst College. Reproduced courtesy of the Amherst College Archives & Special Collections.

Although it is beyond the scope of this essay to address more than a few of Dickinson's volcanic deep mappings, one additional poem, Fr752B, "Ah, Teneriffe – Receding Mountain –", bears mentioning for its particular geologic references within a context of a "theology of nature" that is both reverential and wondrous, a stance evident in the lines of Dickinson's poem as well as the lines from Hitchcock's *Elementary Geology* that may have inspired it. For Dickinson's lexicon suggests that she would have known Tenerife as a "peak volcano on the Canary Islands", but also as the "legendary abode of the All-Creator". In geologic terms it is also the "Receding Mountain" framed by the sunset's "Sapphire Regiments" (1, 3), a mountain with a glacial history the speaker's address directly acknowledges: "Still clad in Your Mail of Ices –", with "Eye ["Thigh"] of Granite – and Ear of Steel –" (5–6). The "All-Creator" implied as residing within the mountain itself in this poem is "Passive alike – to Pomp – and Parting –" (7), even though the speaker is "pleading ["kneeling"] still –" (8), awed

by the mountain's grandeur and visual splendor. Dickinson's Lexicon also describes the etymology of Tenerife as a derivative of the Latin *Pico de Tenerife*, "possibly 'white mountain' or 'luminous one'", a reference that is suggestive of alabaster, another white and luminous stone considered by Dickinson in poems such as Fr124A–G, "Safe in their Alabaster Chambers –". The description of the majestic volcano as "[s]till clad in your Mail of Ices –" seems to acknowledge the paradox of ice layers persisting through fiery eruptions, but the line also perhaps echoes Hitchcock's vivid observation in *Elementary Geology* that an insulating layer of volcanic ash — a powerful non-conductor of heat — allows a mass of ice to persist beneath a flowing current of hot lava above it, and that ice layer will be sustained "from the period of volcanic eruption to the present" (1844, 232). Hitchcock's comments refer specifically to the discovery, in 1828, "of a mass of ice [that] was found on Etna, lying beneath a current of lava", but the story, with its opening line of "This explains a curious fact", is recounted as a "remark" ["Rem."] to be considered more broadly as scientific evidence of volcanic activity (1844, 232).

Hitchcock layers this "curious" account with three additional examples of wondrous active volcanoes, including an interweaving of both "deep past" and "personal participation in a spatial milieu" (MAHER 2014, 10) for the volcano Kilauea, an account that has uncanny resonance with Kilauea's present-day eruptions. Hitchcock describes Kilauea as "the most remarkable volcano on the globe" and quotes from the interwoven stories of English and American missionaries "who have given us the most graphic and thrilling descriptions" of Kilauea's terrible beauty: "Sometimes, and especially at night, such masses of lava are forced up that a lake of liquid fire, not less than two miles in circumference, is seen dashing up its angry billows, and forming one of the grandest and most thrilling objects that the imagination can conceive" (1844, 233). This account recalls the language of sublime experience, of things grand though "terrible"; it seems to confirm Edmund Burke's conviction that "astonishment [. . .] is the effect of the sublime in its highest degree" (2008; 36, 53). Hitchcock also includes an account by "Rev. Mr. Coan, American Missionary" in this same section, one that details the "frightful hissings and detonations" of a "stream of red hot lava" as it "poured into the sea" following "a powerful eruption of this volcano that took place in May and June 1840" (1844, 233). Hiroko Uno perceptively attributes Dickinson's reference to "hissing Corals" in Fr517A as being inspired by this quoted passage from *Elementary Geology*; she also notes that Dickinson's emphasis on "still[ness]" in this poem (as well as in Fr165A and Fr591A) can be traced to Hitchcock's observation

that “a volcanic eruption is commonly preceded by [. . .] stillness of the air” (Uno 2001, 11). Hitchcock’s explications of volcanic formation and activity — replete with interconnected stories and eye witness accounts — were an unquestionable influence on Dickinson’s own volcano-inspired explorations of human and natural history. As Maher explains, “deep mapping chart[s] multidimensional history”; it allows us “to extend our contemporary awareness of the region” (2014, 22). And as awareness extends and deepens for each observer through time in a particular location, deep mapping makes it possible, in effect, “to walk in the stories of this place” (HEAT MOON 1991, 268).

Object lessons abound in other examples of Dickinson’s poems with geologic references that address both human and natural history: in Fr1088A, after death, human “Vitality is Carved and cool —” and commemorated on a gravestone (where “nerve in marble lies”); in Fr147A the lines “a single bone — / Is made a secret to unfold” (3–4), echoes Hitchcock’s “astonishing fact” in *Elementary Geology* that a “single [. . .] bone” in fossil form can reveal with “mathematically exact” accuracy “the condition of the entire animal” that may once have roamed the earth in earlier geologic ages (1844, 85). But two poems, Fr740A and Fr584A, feature object-based deep mappings that I believe can be traced even more directly to the syntactical inspiration and hand drawings found in *Elementary Geology*, and specifically to passages describing what Hitchcock called “the almost infinite variety” of granite formations (1844, 70). No poem better explores a deep mapping of self-reliant possibilities than Fr740A, “On a Columnar Self —”, in which a “granitic base” of conviction provides the foundation for an image of Dickinson’s growing self-awareness, increasingly firm with the certainty of “rectitude” and distinct from the “assembly” of others:

On a Columnar Self —
How ample to rely
In Tumult — or Extremity —
How good the Certainty

That Lever cannot pry —
And Wedge cannot divide
Conviction — That Granitic Base —
Though none be on our side —

Suffice Us — for a Crowd —
Ourselves — and Rectitude —

And that Assembly – not far off
From furthest Spirit – God –

11–12 Assembly – not far off / From furthest Spirit – God –]
Companion – not far off / from furthest Good Man – God –
12 Spirit] Faithful

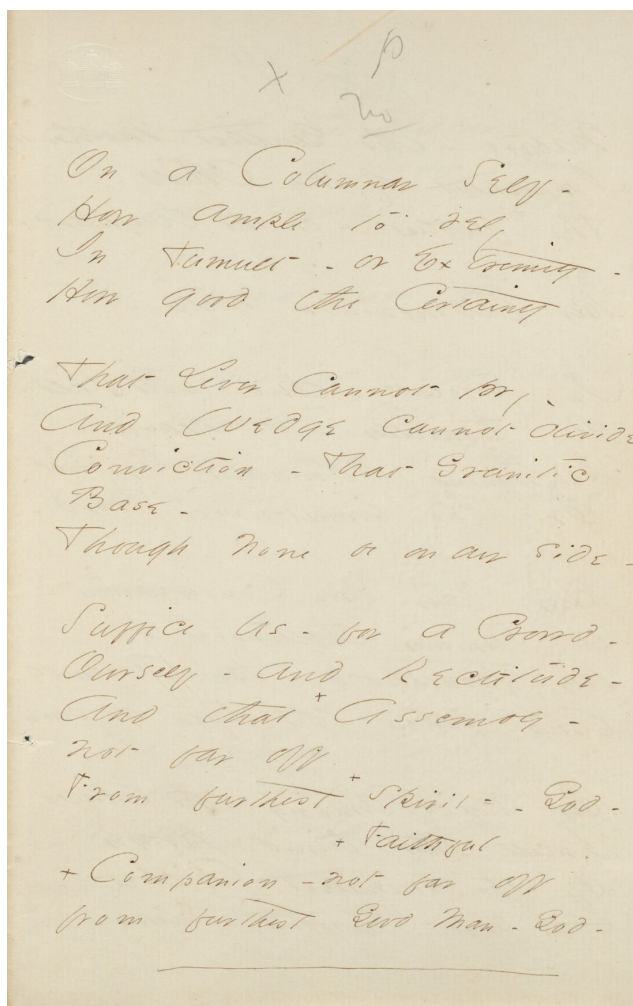


Figure 6. Emily Dickinson, “On a Columnar Self –” (H 98), Fascicle 36, about the second half of 1863. Reproduced courtesy of the Houghton Library, Harvard University.

The poem is replete with stone references, and the unusual word “columnar” in the first line is featured in a substantive section from Hitchcock’s textbook on the “Columnar Structures” of granite trap rocks found on nearby Mt. Holyoke. Hitchcock notes that “[o]ne of the most remarkable characteristics of the trap rocks, is their columnar structure [. . .] whose length is sometimes not less than 200 feet [. . .] whose extremities are more or less convex or concave, one fitting into the other. Usually these columns stand nearly perpendicular. [. . .] They stand so closely compacted together, that though perfectly separable, there is no perceptible space between them” (1844, 74–5). In Fr740A, which incorporates the words “columnar” and “extremity” found in Hitchcock’s passage, a geologic deep mapping of granite trap rocks is infused with an interconnected story of human history and perhaps even a topical reference to Amherst social mores. Dickinson’s “Columnar Self” is separate and proudly distinct from the “Assembly” of those who stand “so closely compacted together”, like trap rocks with their convex and concave extremities aligned with “no perceptible space between them” (HITCHCOCK 1844, 74–5). Moreover, Dickinson’s self is an ample resource in both “Tumult” and “Extremity”, and its “granitic base” stands firm against the levers and wedges of societal norms and conventions. By the time she wrote this poem, Dickinson would have seen literal attempts in 1855 to extract a large bolder with levers and wedges on the corner of her father’s property. The project was conducted by Edward Hitchcock’s geology students from Amherst College, and several newspapers published eye-witness accounts of the successful extraction of the massive rock.¹¹ Emily Dickinson herself could easily have been an eyewitness, as her bedroom window looked directly at that corner of the Homestead lawn. Dickinson never commented on this well-known topical event, but the “Granitic Base” of poem Fr740A is *not* extracted by any exterior efforts of “Assembly”: instead it holds the “Columnar Self” upright with an “ample” foundation (1–2).

Bakhtin’s chronotopes, with their deep mapping of time and space narratives, offer a useful starting point for the second granite-based poem I’ll address, Fr584A, “We dream – it is good we are dreaming –”. In the narrative of Bakhtin’s chronotope, “time, as it were, thickens, takes on flesh, becomes artistically visible; likewise space becomes charged and responsive to the movements and intersects of time, plot, and history. This intersec-

11. See the June 7, 1856 edition of *The Springfield Republican* (page 4, column 5), for an account of the boulder extraction that would have been read in the Dickinson Household.

tion of axes and fusion of indicators characterizes the artistic chronotope" (1981, 84, 85). As Maher explains, "Like the vertical axis in one Bakhtin's chronotopes, '[everything] that on earth is divided by time, here, in this verticality, coalesces into eternity,' into a drama of 'pure simultaneous coexistence'" of phenomena taken from widely separate periods of time.¹²

Poem Fr584A can be addressed in light of distinctions between dreaming of death and the reality of dying — with the image in the final stanza identified as a gravestone with an inscription on its granite surface. But it may also be possible to see this poem in light of a specific passage from *Elementary Geology*. Edward Hitchcock's textbook notes the proofs that granite eruptions can be definitively traced "in no less than four different epochs" with linked intersects in time and history (1844, 26); it is possible that Dickinson's poem builds on this deep mapping with an intersect of human and geologic dramas that "coalesce" into eternity — into a drama that is never dead.

The opening line of Fr584A perhaps offers a nuanced reference to Prospero's musings on dreams in *The Tempest*, and lines 3 and 4 juxtapose the plot of our human "playing" within the larger "play" of something outside of our mortality — that drama that extends well beyond the "truth of Blood" that we "die – Externally":

We dream – it is good we are dreaming –
It would hurt us – were we awake –
But since it is playing – kill us,
And we are playing – shriek –

What harm? Men die – Externally –
It is a truth of Blood –
But we – are dying in Drama –
And Drama – is never dead –

1 We dream] We are dreaming 1 are dreaming] should
[dream] – 2 would] marked for an alternate, none given
3 it is] They [are] 6 truth] Fact 8 never] seldom – (1–8)

12. Maher quotes from Loren Eiseley's "The Slit" in this passage; for additional commentary on Eiseley's use of Bakhtin's chronotopes and "coalesce[nce]", see chapter 1 of MAHER 2014.

Bakhtin's intersect of the time and space narrative in which human dramas "thicken and take on flesh and become artistically visible" (1981, 84) seems to apply in the first eight lines; our lives are plotted, a finite part of "the everything" on the earth that is divided by time, including distinct epochs in geology, but they will also "coalesce" in an unending Drama of eternity (MAHER 2014, 15). Perhaps the simultaneous coexistence of the finite and the infinite is a truth that lies beyond our ken; a full understanding would "hurt us" were we fully awake to it. "We dream – it is good we are dreaming", Dickinson affirms in line 1; we are, as Prospero reminds us, "such stuff dreams are made on, and our little life is rounded with a sleep" (IV, 1, 148–50). The final line in the poem, however, suggests that it is wiser — more "prudent" — to dream:

Cautious – We jar each other –
 And either – open the eyes –
 Lest the Phantasm – prove the mistake –
 And the livid Surprise

Cool us to Shafts of Granite –
 With just an age – and a name –
 And perhaps a phrase in Egyptian –
 It's pruderter – to dream –

10 the] it's 11 the mistake –] just [mistake] – 15 phrase in
 Egyptian –] latin inscription – (9–16)

Although there is much ambiguity in this poem, I suggest that the inspiration for Dickinson's cryptic final stanza — in which we are "Cooled" to shafts of Granite" and "given an age – and a name – / And perhaps a phrase in Egyptian –" to define us further — can be traced to *Elementary Geology*, specifically to Hitchcock's description and drawing for "Graphic granite", a rock with a vast range of crystalline fragments of quartz and feldspar. Hitchcock notes that the arrangement of crystals "makes the surface of this granite exhibit the appearance of letters" (1844, 70); he then directs the reader's attention to Figure 41 in his text, a drawing of the lettered surface of this granite that is found on the opposite page. Just below the drawing is a reference to a famous rock form in Upper Egypt, one much employed in ancient monuments, a rock that Hitchcock determined was not syenite, but rather "granite with flecks of black mica" (1844, 71–2).

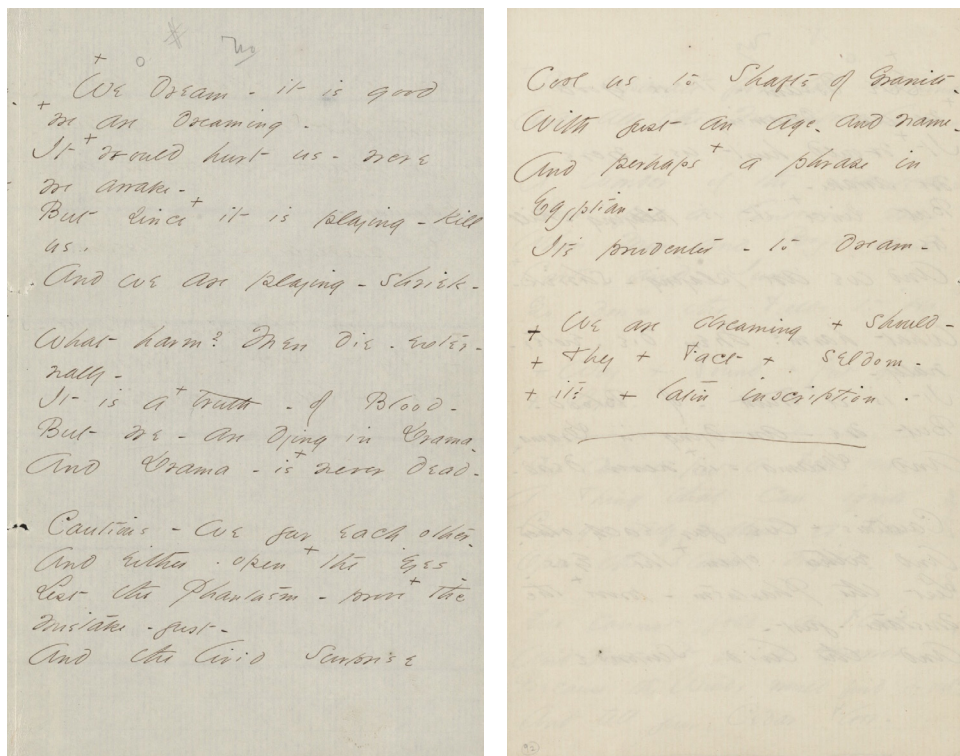


Figure 7. Emily Dickinson, "We dream – it is good" (H 92), Fascicle 25, about summer 1863. Reproduced courtesy of the Houghton Library, Harvard University.

The image and the language used for Figure 41 (see Figure 8) recall, at least in oblique ways, the Rosetta Stone deciphered by Champollion twenty years earlier, another stone with a lettered surface, a section of which is written in hieroglyphics, or "phrase[s] in Egyptian –". Hitchcock does not make any reference to the Rosetta Stone in this passage, but the text that appears directly below his drawing may well have led Dickinson in this direction for her own deep mapping in poem Fr584A.¹³ And the

13. Champollion deciphered the Rosetta Stone in 1822 after years of study; the achievement was widely known in the nineteenth century. The grandiorite stone — similar in composition to granite — is a fragment of a rectangular stele discovery in 1799 in Memphis, Egypt. It is likely that Dickinson (and Hitchcock) would both have known of this discovery and decipherment.

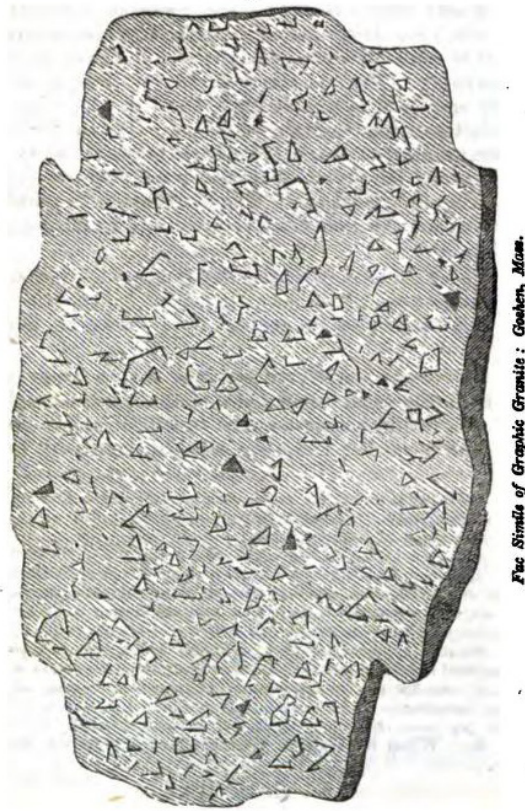


Figure 8. Edward Hitchcock, “Graphic granite” (hand-drawn illustration), *Elementary Geology*, 1841.

line “Cool us to Shafts of Granite” has a natural geological intersect with the “livid Surprise” of the line that precedes it. Indeed, Dickinson’s lexicon defines “livid” as “fiery and blazing” — perhaps a reference to the igneous origin of granite that Hitchcock addresses in his text: shafts of granite are formed by hot magma that has cooled and hardened (1844, 70). Hitchcock’s drawing with its “appearance of letters” on “the surface” (1844, 70) is a facsimile of a rock found in the 1840s in Goshen, Massachusetts; the text of the observation below that drawing is a cross-sectional story that alludes to the ancient monuments of Upper Egypt. In Dickinson’s poem, the two deep map features are “coalesce[d]” to borrow Loren Eiseley’s phrasing, in dramas of “simultaneous coexistence” (quoted in MAHER 2014, 15).

Fr740A and Fr584A are only two of the examples of the interesting connections — some definitive, others perhaps more nuanced — between Dickinson's poetry and the granite-based language and illustrations found in Edward Hitchcock's *Elementary Geology*. But more broadly, it is Hitchcock's comprehensive analysis of the "mineral masses that compose the earth", as well as the "organic remains which they contain" (1844, 2) — the grounding definition of Geology — that provide a solid reference point for many of Dickinson's most compelling "artful braiding[s]", to borrow Maher's phrasing (2014, 10). Indeed, Richard Sewall's long-ago assertion that "Hitchcock at his best combined mystical fervor and pure aesthetic delight with sharp scientific observation" in "many a passage [that] could have prompted a later poem of Emily's" (1974, 344), is born out in contemporary approaches to what Maher calls "the aesthetic and the ethos" of modern deep mapping (2014, 23). Shelley Fisher Fishkin's recent challenge to American Studies scholars to use deep mapping as a way to build most productively on the critical insights of the past is a worthy clarion call, for "the 'true' deep map remains open-ended and continues to invite new contributions and fresh queries" (2011, 3). Moreover, in Fishkin's view, "deep maps are palimpsests in that they allow multiple versions of events, of texts, and of phenomena to be written over each other — with each version still visible under the layers" (2011, 3). The image of the palimpsest is consistent with the vernacular of deep mapping, and it invites both scholarly exchange and the recovery of insights that would otherwise be lost. The richly layered geological epochs addressed in both Hitchcock's texts and Dickinson's poetry can be seen within a similar image-based context of exchange and recovery — in this case, recovery of what is missing from the "gaps" in our understanding of both natural and human history. Hitchcock spent most of his life as a scientist engaged in the process of discovering what was *not* known about the earth's geological continuum, and he relied on the palimpsests of scientists before him as well as the deep map evidence of the earth itself, with "each version" of the earth's story "still visible under the layers" that came before it. Dickinson's attempt to understand both human history and the world as she knew it (as well as the world beyond) was her self-stated occupation of life, her business of "Circumference" (L268) — a word she would have seen used in Hitchcock's text "to represent the proportion of all melted and unmelted matter in the earth" (1844, 250). Her poems engage deeply with the palimpsests and multivalent forms of deep mapping provided by Hitchcock and others, even as she generates her own visionary insights and unique solderings of

both similar and disparate objects as a way to grapple with the gaps in her understanding. The best writers “construct deep maps to stretch boundaries, to enlarge vision and scale, to multiply perspectives, and to make the finite and the infinite touch”, Maher advises (2014, 62). Writing from a “Granitic Base” of “Conviction” (Fr740A) — with her focus on “eternity” as the “only adamant Estate / In all Identity” (Fr1397A) — Dickinson’s poetic deep mappings do nothing short of that.

Saint Michaels College

Works Cited

- BAKHTIN, Mikhail M. 1981. “Forms of Time and of the Chronotope in the Novel”. In *The Dialogic Imagination*, edited by Michael HOLQUIST, 84–258. Austin: University of Texas Press.
- BRANTLEY, Richard. 2013. *Emily Dickinson’s Rich Conversations: Poetry, Philosophy, Science*. Basingtoke: Palgrave.
- BURKE, Edmund. [1757] 2008. *A Philosophical Enquiry into the Origin of our Ideas of the Sublime and Beautiful*. Oxford: Oxford World’s Classics.
- DICKINSON, Emily. 1998. *The Poems of Emily Dickinson*, 3 vols., edited by R. W. FRANKLIN. Cambridge, MA: The Belknap Press of Harvard University Press.
- . 1958. *The Letters of Emily Dickinson*, 3 vols., edited by Thomas H. JOHNSON and Theodora WARD. Cambridge, MA: Harvard University Press.
- EBERWEIN, Jane Donahue. 1996. “Siren Alps: The Lure of Europe for American Writers”. *The Emily Dickinson Journal* 5.2: 176–82.
- EMERSON, Ralph Waldo. 1983. *Essays and Lectures*, edited by Joel PORTE. New York: The Library of America.
- FISHKIN, Shelley Fisher. 2011. “‘Deep Maps’: A Brief for Digital Palimpsest Mapping Projects (DPMPs, or ‘Deep Maps’)”. *Journal of Transnational American Studies*, 3.2. Web. Retrieved from <https://escholarship.org/uc/item/92v100t0>
- HARMS, Tekla A. 2011. “The Hitchcock’s Classroom Charts”. In *Orra White Hitchcock: An Amherst Woman of Art and Science*, edited by Robert L. HERBERT and Daria D’ARIENZO, 49–55. Amherst: Mead Art Museum.
- HEAT-MOON, William Least. 1991. *PrairyErth: (a deep map)*. Boston: Houghton Mifflin.
- HERBERT, Robert L., ed. 2008. *A Woman of Amherst: The Travel Diaries of Orra White Hitchcock, 1847 and 1850*. Bloomington, IN: iUniverse.
- HERBERT, Robert L. and D’ARIENZO, Daria. 2011. *Orra White Hitchcock: An Amherst Woman of Art and Science*. Amherst: Mead Art Museum.
- HITCHCOCK, Edward. 1851. *The Religion of Geology and its Connected Sciences*. Boston: Phillips, Sampson, and Company.
- . 1844. *Elementary Geology*, 3rd edition. New York: Dayton & Newman, Web. <https://babel.hathitrust.org/cgi/pt?id=ien.35556005137955;view=1up;seq=11>

- HOWARTH, William. 1983. *Thoreau in the Mountains*. New York: Vintage Books.
- MAHER, Susan Naramore. 2014. *Deep Map Country: Literary Cartography of the Great Plains*. Lincoln: University of Nebraska Press.
- MACFARLANE, Robert. 2004. *Mountains of the Mind: Adventures in Reaching the Summit*. New York: Vintage.
- ORSINI, Daniel. 2016. *Galactic Pilgrim*. Cranston, RI: Quartinity Books.
- PATTERSON, Rebecca. 1979. *Emily Dickinson's Imagery*, edited by Margaret H. FREEMAN. Amherst: The University of Massachusetts Press.
- PEEL, Robin. 2010. "Poetry, Paleontology, and Geology". In *Emily Dickinson and the Hill of Science*, 13–72. Madison, NJ: Farleigh Dickinson University Press.
- RICH, Adrienne. 1976. "Vesuvius at Home". *Parnasus: Poetry in Review* 5.1. <http://par-nassusreview.com/archives/416>
- ROORDA, Randall. 2001. "Deep Maps in Eco-Literature". *Michigan Quarterly Review: Reimagining Place* 40:1, 257–72.
- SIELKE, Sabine. 1996. "Dickinson's Threshold Glances, or Putting the Subject on the Edge". *Emily Dickinson Journal* 5.2: 93–9.
- SEWALL, Richard B. 1974. *The Life of Emily Dickinson*. New York: Farrar, Straus and Giroux.
- SHELLEY, Percy Bysshe. "Mont Blanc: Lines Written in the Vale of Chamouni". *Poetry Foundation*. Web. www.poetryfoundation.org.
- UNO, Hiroko. 2001. "Geology in Emily Dickinson Poetry". *Kobe Jogakuin Daigaku* 48, 1–25.
- WHITE, Fred D. 1992. "'Sweet Skepticism of the Heart': Science in the Poetry of Emily Dickinson". *College Literature* 19.1: 121–8.