# Intervals of Inspiration:
# Nineteenth-Century American Sublime Science

By Rob Friedman

---

Presented at the New-CUE
— Nature and Environmental Writers, College and University Educators —
Fifth Environmental Writers' Conference
In Honor of Rachel Carson
Booth Harbor, Maine, 10-13 June 2008

Intervals of Inspiration:
Nineteenth-Century American Sublime Science
— Rob Friedman

The title of my paper comes from an essay on poetry that Thoreau read to an audience at the Concord Lyceum in late 1843. Toward the end of his talk he said, "There are two kinds of writing, both great and rare; one that of genius, or the inspired, the other of intellect and taste, in the intervals of inspiration."[1] I don't think that Thoreau is subordinating one to the other, though some of us might value the product of inspiration over work that's generated with the goal of cultural and aesthetic expression in mind. Nor is he conflating the two kinds of writing, as if to demonstrate some sort of symbiosis. Rather, the relationship between these two types of writing is one in the service of an organic process, one with the roots of an inspired work of genius planted in the dynamic cultural soil of metaphor, rich with nutrients like cognition and aesthetics. If the inspired work of genius is at all crafted, that shaping takes the form of calculation, as it emanates from what Thoreau describes as "a train of thought [that] moves with subdued and measured step."[2]

While Thoreau may very well have intended the word "measured" to amplify the caution we usually connote with a subdued step, measurement was as much an objective, serious and quantitative activity for him as it was a qualitative and subjective force of consideration. Thoreau we know primarily as a naturalist and poet, as well as a scientific field worker in service of Linnaean classifiers such as von Humboldt and Agassiz, but he also spent a great deal of time as a surveyor, a professional measurer of metes and bounds. Two years

[1] *Early Essays and Miscellanies*, Joseph Moldenhauer, Edwin Moser and Alexander Kern, eds. Princeton: Princeton University Press, 1975, p. 171.
[2] Ibid, p. 172.

ago, I presented Thoreau as an object lesson for measurement used as a metaphor to bring the literary and scientific strands of his life together. I was trying to make the point that the wellspring of that trope served as the malleable material that fills the intervals of inspiration.

Today, I'd like to situate Thoreau along a continuum of authors whose work both straddles and unites aesthetic and scientific endeavors of the 19th century. He is one of many writers, scientists and intellectuals, including naturalists, ecologists, technologists, politicians, historians and philosophers that together represent an American expressive trajectory for scientific fact and method as well as aesthetic practice and realization. I'll briefly outline a path that begins with Jefferson's descriptions of nature and landscape in the service of political economy as the basis of an environmental perspective. It yields to American Romantics' socio-technical descriptions of their immediate and extended environments. Works such as *Eureka*, *Walden*, and *Moby-Dick*, for example, display an increasing tension between the forces of romanticism in the contexts of literature and philosophy, and experiment and empiricism in the service of natural science. The 19th-century's portion of the path concludes with Henry Adams' cultural criticism and historiography, at once intro- and retrospective. Jefferson, Poe, Melville and Thoreau foreground the perspectives that Adams applies to his considerations of iconic architecture in *Mont Saint Michel and Chartres*, and political and cultural history veiled as third person autobiography in *The Education of Henry Adams*.

Parallel to these authors' projects are theoretical and experimental innovations in physical sciences such as ecology and social sciences such as behavioral psychology taking shape in American and Europe, where refinement and accuracy of measurement is simultaneously a method and a goal. From a macro view, as the forces and presence of romanticism waxes toward mid-19th century and wanes toward the twentieth, science sheds its foundations in natural

philosophy to become staunchly empirical. More specifically, as A. Hunter Dupree characterizes it, by the end of the "nineteenth century the scientific exploration-survey behavior setting, with its supporting institutions--the museum, the herbarium, the astronomical observatory--went into an eclipse behind the new setting for science--the laboratory." [3] What remains constant, however, is the presence of metaphors of measurement employed as currency, as media of exchange for the belief systems and material culture promulgated by politicians, scientists, philosophers and writers. Metaphors of measurement exploit J.F. Herbart's notion of the threshold or limen of consciousness, which was a precursor to the idea of the just noticeable difference, that point at which one becomes aware of sensation or change, a watershed concept for the burgeoning field of experimental psychology in the latter 19th-century. The limens of consciousness, for Herbart, "represent … a transition from the pure speculation of Kant and Fichte and Hegel to the anti-metaphysical experimentalism of Fechner and Wundt and Helmholtz." [4] In Michael Haley's study of Peirce's semeiotics, he finds that "Poetic metaphor involves the balanced use of all three signs in Peirce's most famous trichotomy: the Symbol, the Index and the Icon … Poets generally do not resort to shocking juxtapositions just to get our attention; they use the metaphoric index to direct our attention to a genuine iconic relationship which we might otherwise have missed." [5] Metaphors of measurement smooth the transmission of truth and beauty from actor to audience, and aid in what I contend is a common goal for the authors

---

[3] A. Hunter Dupree, "The Measuring Behavior of Americans," in *Nineteenth-Century American Science: A Reappraisa*l. Ed. George H. Daniels. Evanston: Northwestern University Press, 1972, pp. 22-37.

[4] Edwin G. Boring, A History of Experimental Psychology. New York: Appleton-Century-Crofts, 1950.

[5] Michael C. Haley, *The Semeiosis of Poetic Metaphor*. Bloomington, IN: Indiana University Press, 1988, pp. 14, 16.

and scientists that employ them: articulation of the sublime in the form of scientific advancement, artistic productivity and historical reckoning.

We can better understand this sublime teleology shared by science and aesthetics when we consider their practitioners' work as responding to complementary and interacting systems of thought rather than discrete cultural and disciplinary elements in an increasingly complex environment. But what is also essential to examine is the mechanism by which these disparate elements communicate with each other. Metaphor, I suggest, is just that mechanism. By examining the historical and contextual influences that quantitative methods, empirical processes and aesthetic representation of the sublime reciprocate through metaphor, we can provide context to Rob Wilson's finding that the "American sublime functions as a trope of empowerment emanating, in part, from a will to re-imagine the American ground."[6] In Barbara Packer's view, Americans' understanding of empiricism and sublimity "lies neither behind us, in Europe, nor beyond us, on the frontier, but in those moments when perception becomes uncanny, and suddenly finds in the deserted landscape a more than human power."[7] As our perception of such abstractions changes, as Julian Jaynes makes clear, so does "The grand and vigorous function of metaphor, [which] is the generation of new language as it is needed, as human culture becomes more and more complex."[8] In other words, metaphor can be construed as an organic and evolutionary trope.

We can extend this trope into the mid-20th century through scientist-writers such as Rachel Carson. In her 1955 essay "The Marginal World," the

---

[6] Rob Wilson, *American Sublime: The Genealogy of a Poetic Genre*. Madison: U Wisconsin P, 1991, p. 34.
[7] Barbara L. Packer, "Man Hath No Part in All This Glorious Work": American Romantic Landscapes," in *Romantic Revolutions: Criticism and Theory*, Eds. Kenneth R. Johnston, Gilbert Chaitin, Karen Hanson and Herbert Marks. Bloomington: Indiana UP, 1990, p. 267.
[8] Julian Jaynes, *The Origin of Consciousness in the Breakdown of the Bicameral Mind*. Boston: Houghton Mifflin, 1976, p. 49.

shoreline is "an ancient world" where she gains, on returning to it, "some new awareness of its beauty and its deeper meanings, sensing that intricate fabric of life by which one creature is linked with another, and each with its surroundings."[9] For Thoreau as for Carson, whose ability to engage scientifically a public more at ease with narrative than with fact, metaphor is a tool for stitching together a fabric containing both person and place, even when that place is the shifting shoreline. For a scientist seeking elemental knowledge of the physical world, metaphor is what brings her close to understanding, and both her and our experience of it is the manifestation of the sublime. Bryan Wolf, in an essay on sublime expression and Melville's *Moby-Dick*, talks about the threat that "comes not from language but from ourselves: It lies in our inability to discriminate limits, to recognize where our discourse ends and someone else's begins. What we learn from Ishmael is not to take our own vision too exclusively; we need to make our peace with the lapses."[10]

This conference's keynote speaker had a New York Times editorial notebook piece just a few weeks ago that described the experience of trying to fix his own position in New York Harbor as he learned to sail. Here, as in *Moby-Dick* as well as Carson's marginal world, physical limits, or more to the point, our inability to fix them, become conflated with our sense of self. Klinkenborg writes:

> We are sailing, in fact, in a problem of perspective. Here we are, tacking toward Ellis Island across a broad flatness between two strongly vertical

---

[9] Rachel Carson, "The Marginal World," in *The Edge of the Sea*. New York: Houghton Mifflin, 1955.

[10] Bryan Wolf, "When Is a Painting Most Like a Whale?: Ishmael, *Moby-Dick*, and the Sublime," in *New Essays on* Moby-Dick, Richard H. Brodhead, ed. New York: Cambridge University Press, 1986, p. 163-4.

> shorelines. Is Jersey City near or far? How about the Statue of Liberty? It's hard to tell. Looking down on the harbor from the map in my office, it's easy to distinguish every landmass, every tongue of water. But out in the harbor itself, the tip of Manhattan merges with Brooklyn, which is contiguous with Governor's Island, which has engulfed Staten Island. Up the Hudson, Midtown Manhattan seems to have gone to Jersey for the morning. We tack and jibe, pivoting across the wind again and again, and the land pivots with us. Not till we are well out — the Staten Island Ferry running abreast of us — does the East River appear, dividing the boroughs as the map says it should.[11]

In my readings of Jefferson, Poe, Thoreau, Melville and Adams, measurement metaphors serve as a common base for mapping, assessing and bridging the intervals of scientific and aesthetic expression each writer presents. Jefferson and Thoreau, land surveyors both, provide a perspective that continues to influence our concepts of space, place and purpose of the natural world. Metaphors of measurement, uniting craft and inspiration, are the tools Poe uses to navigate the immeasurable supernal, to experience beauty and truth, and to guide his readers through the quotidian, sensible world toward the realization of Unity, a metaphysical truth, whose comprehension is equivalent to sublime experience. And although Henry Adams was neither scientist nor surveyor, he was enamored with the sublime power of architectural design and the rapidly strengthening powers and applications of the dynamo, understanding power as a process, observable and measurable in terms of its presence, intensity and cessation. Being Adams, however, means being enmeshed in the dichotomy that

[11] Verlyn Klinkenborg, "Sailing the Waters of New York Harbor," New York Times, May 20, 2008.

William Jordy[12] identifies: understanding historiography as based in either a scientific or a literary narrative point of view.

Triangulation, a fashionable metaphor today, was the primary orientation technique of land surveyors such as Thoreau and sailors such as Melville. But whereas Thoreau surveys to know his current position, and Melville's most famous captain curses his quadrant's inability to tell him where he or Moby Dick might be tomorrow, Jefferson looks to the technologies of measurement and the agency of Lewis and Clark to map a political future inclusive of the western territories, saying that "We shall delineate with correctness the great arteries of this country: those who come after us will extend the ramification as they become acquainted with them, and fill up the canvas we begin."[13] Not only would the American territory and political project be reified as an aesthetic cartographic object, one based in painstaking measurements, but the measurements themselves, undertaken with the best technologies and techniques available, would stand as a testament to Jefferson's privileging of Enlightenment science as his basis to cultivate technological interests toward objective, political and social ends — the grid system of land division and ownership being one prominent example.

Jefferson's *Notes on the State of Virginia* builds on this mode of thought, but he moves beyond empiricism by situating the text as a middle ground between an emerging Enlightenment science and a burgeoning American romantic sublime. Jefferson's responses to the disparagement of American natural resources present his voice as one of the first to explicate the relationships between political economy and ecological awareness. As David Nye points out in reference to Jefferson's description of Virginia's Natural Bridge, Jefferson

---

[12] *Henry Adams: Scientific Historian*. New Haven: Yale University Press, 1952.
[13] Donald Jackson, ed. *The Letters of the Lewis and Clark Expedition, with Related Documents., 1783-1845*, 2nd ed., Vol. 1, p. 245, Urbana: University of Illinois Press, 1978.

abandons neutral scientific tones as he recalls powerful emotions and urges the reader to seek out, as a necessary counterpart to the view from below, "the 'painful and intolerable' view [from above]. The natural bridge is sublime because it is terrifying, painful, almost intolerable, and yet at the same time delightful. It is enormous yet graceful, massive yet light. It induces both terror and rapture." [14] How close this description is in comparison to Melville's Moby Dick as an animated Natural Bridge in "The Chase — First Day," as the whale's "marbleized body formed a high arch" that evoked a "gentle joyousness" but also a sense of strength comparable to Jove's, "that great majesty Supreme!" (ch. 133). While for Jefferson the sublime was inseparable from a peculiar double action of the imagination by which the land was appropriated as a natural symbol of the nation while at the same time it was being transformed into a man-made landscape, in Wolf's reading of Melville's contemporary aesthetic, the sublime was "an astonishing capacity of mind, an ability to consume the world as nothing more than a plenum of nutrients in that characteristically American project of self-making. At its most audacious, the sublime entailed a virtual substitution of self for world … an incestuous twining of nature back into the self, the NOT ME into the ME."[15] In the space of 50 years, Jefferson's imaginative doubling of land as symbol and product is replaced by Emersonian eyeball egotism taking form in Thoreau and Melville's viewing "the world from great heights, whence each proceeds to transform the threat presented by nature into an opportunity for self-expression."[16]

Poe's *Eureka* contains metaphors of measurement that unite aesthetics with natural philosophy, and link empirical scientific method to metaphysics — all in support of Poe's quest for precision in descriptions of physical reality and

[14] David E. Nye, *American Technological Sublime*. Cambridge: MIT Press, 1994, p. 20.
[15] Wolf, p. 155.
[16] Ibid, p. 159.

completeness in aesthetic expression. Poe uses metaphors of measurement as a primary rhetorical tool to adapt Laplace's nebular hypothesis, one of the leading contemporary theories of cosmogony, toward unifying the disparate worlds of empirical scientific theory and the increasingly challenged Romantic perspectives of transcendental metaphysical constructs. By doing so, Poe conjoins form and imagination through metaphor to articulate sublime experience as the positive and inevitable outcome of the unifying forces supporting his aesthetic and cosmogonic philosophies.

Even though Poe believed that "subjects which surpass in grandeur all efforts of the human imagination are well depicted only in the simplest and least metaphorical language",[17] he doesn't reject metaphor. In fact, he seeks in *Eureka*'s second paragraph explanatory terms that are "sufficiently simple in their sublimity — sufficiently sublime in their simplicity"[18] — thus creating an elegantly alliterative equation that situates his general proposition — that the germ of the inevitable annihilation of the unity of the first thing is contained within the secondary cause of all things — that is so abstruse and large that the precise language of science is insufficient to accommodate realization of a metaphysical truth. To make his ideas clear, he paradoxically must revert to metaphor, as this is a way to encompass both the denotative precision of science and transcendent, metaphysical images, thereby providing a route to the sublime. Poe, like Thoreau and Jefferson and Carson, employs metaphor for the purpose of spanning and closing the gap between idea and experience, connecting intelligence to imagination, and through that connection, creating art worthy of our investment.

Today, Klinkenborg considers the "map [of New York Harbor] in my office" while coming to the conclusion that "It's impossible to cruise the harbor

[17] Edgar A. Poe, *Complete Works* Vol. XI, p. 22
[18] Edgar A. Poe, *Poetry and Tales*. New York: Literary Classics of America, 1984, p. 1261.

without wondering what it would have been like to be afloat here in 1901, to sail among the shipping of a working nautical city. Whatever else may have changed since then, the wind in the sails is still the same." Klinkenborg sounds more comfortable with his map than he does with his perception. The shifting land masses his perspective produces instigate a sense of playful chaos that, if occurring 100 years ago and culminating in a transcendent experience would qualify as sublime, yet today yields a urban irony: the map in his office is a representation, the product of someone else's construction. Yet the vicissitudes of his experience on the water create the illusion that the same land masses measured to be reproduced in the map are immeasurable — uncontrollable — in his direct experience. Environment directly experienced through tiller and mast is far from the constant of environment cognitively realized through engagement with his map, begging the questions, which is the illusion, the imagined and which is the real, but perhaps even more important, what language tool can be most effectively applied to negotiate the distance between the physically and perceptively real?

Our dialectic of quantitative and qualitative explanation of experience, two poles of measurement that through the 19th-century employ metaphor to unify the projects of science and literature in our quest for an iteration of the sublime, yields an opportunity to understand and express to others the immeasurable awe experienced in nature. Thoreau's surveying is much like Klinkenborg's sailing in that they both engage experience that culminates in sublimity once that experience has been worked out in language. Similarly, Carson's inquiry into the middle ground of the seashore to ascertain the proximate relations of the strands comprising the intricate fabric of life provides her with a pathway to explaining the sublime dissonance experienced on the shore, a method perhaps opposite to Poe's seeking of sublimity through annihilation of unity. Adams, Jefferson and Klinkenborg share an invocation of

history to expose its agency in our understanding of space and place, gained through the use of metaphor to close the gap, to shrink the interval, between our available vocabulary, necessary to connect with others, and our own distance from realizing sublime experience.

19th-century American culture can be described in many different ways, one of which is to invoke an opposition of parts and wholes. Whereas the general cultural trend was increasingly empirical and positivist, privileging parts over wholes (consider scientific method and experimentation, factory production and Taylorism), writers whose aims were epistemological, metaphysical and ontological sought ways to envelope quantification and measurement in terms and tropes comprehensible to readers comfortable with narrative and lyrical forms but curious and ill-informed about science. Their texts expose the resulting tensions. Jefferson sought to translate his transcendent experiences in his natural surroundings, characterized as awe-inspiring but nearly overwhelming, into political ends resulting in a stable nation. Thoreau, who in blissfully collecting and classifying his botanical surroundings invokes the order implicit in his Harvard experiences with classical Greek writers, also looks to the bottom of Walden Pond to grasp the sublimity of the stars reflecting in its surface. If Poe's approach to sublime expression can be thought of as privileging calculation and ratiocination in his attempt to explicate metaphysical principles of unity, we must leave it to Henry Adams' to depict how finite distance collapses into an immeasurable abstraction that is at once an awe-inspiring experience for the writer and a way for the reader to be situated into that same experience. His third-person autobiography invokes the metaphor of triangulation by depicting the author's trifurcation: at once attuned to his 18th-century political roots and his 20th-century socio-cultural condition, Adams' narrative voice takes its position removed from but with keen view of both present and past. Such implicit and explicit invocation of measurement

metaphors throughout the 19th century not only, "as Max Weber argued, [used] measurements and calculations of performance and efficiency as central activities within most modern bureaucratic and industrial organizations,"[19] but also demonstrates how incalculably inextricable we are from our intervals of inspiration.

We can better map the intersections of aesthetics and science in 19th-century America by taking note of how metaphor of measurement assists writers and scientists in their seeking and articulating experiences leading to knowledge and self-understanding, and resulting in sublime expression. For scientists, with their tools of measurement increasing their ability to observe finer and finer distinctions in their subjects, sublime experience comes in the form of locating, identifying and classifying their subject's essence; they work toward an objective description of ontology. For writers who seek to articulate a sublime experience intended to yield metaphysical insight, the scientist's measure is wrought metaphoric so as to connect reader and world with the writer's experience. Even as scientists' agendas become more and more objective in scope and goal, their measurement tools take on a metaphoric quality that serves to bridge object and concept. As the writer's agenda steers towards articulations of grand and metaphysical truths, the use of measurement metaphors increasingly becomes the right tool to engage an audience.

[19] Andrew Barry, "The history of measurement and the engineers of space," *British Journal of the History of Science*, vol. 26, 1993, p, 464.