The background of the cover is a watercolor illustration of a classical building facade. It features several tall, fluted columns in shades of purple, blue, and white. To the left, there is a structure with arched windows, rendered in deep purple and brown tones. The overall style is textured and layered, with various colors like green, orange, and brown interspersed throughout the composition.

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# Classics and Complexity in *Walden's* “Spring”

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**I**N 1843, TWO YEARS before Henry Thoreau built his cabin at Walden Pond, the Fitchburg Railroad laid down tracks through the woods near the Pond for its line connecting Boston to Fitchburg. The original Fitchburg Line, at 54 miles long, was, until 2010, the longest run in the present-day MBTA Commuter Rail system. And it is one of the oldest railways in New England. By 1900, fortunes swelled and the Fitchburg’s Hoosac Tunnel Line took passengers and goods westward toward Chicago. The Lake Champlain Route connected Boston to points north like Burlington, Vermont. (See Figure 1.)

**FITCHBURG RAILROAD.**

**Hoosac Tunnel Route.**

The Short Line between



**BOSTON** and  
Albany,  
Niagara Falls,  
Chicago,  
St. Louis,  
Cincinnati,

And All Points West.

**Lake Champlain Route**

Between **BOSTON** and  
**Burlington, Vt., Montreal, Ottawa**  
And all Canadian Points.

Palace, Sleeping, or Drawing Room Cars on all through trains.

For Time-Tables or space in Sleeping Cars call on any Ticket Agent of the Company, or address  
**A. S. CRANE, Gen. Traffic Mgr.**  
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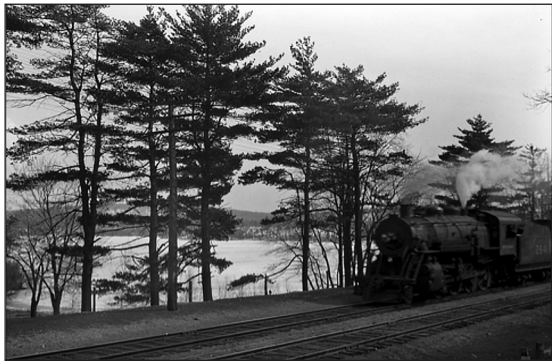


Figure 1 (left): Advertisement for the Hoosac Tunnel Route in *The New England Magazine* (Vol. 21, Issue 6, February, 1900).

Figure 2 (right): Herbert Wendell Gleason. *The Fitchburg Railroad and Walden Pond in winter, Concord, Mass., March 24, 1920.* Courtesy Concord Free Public Library.

The Railroad was literally a fixture in Thoreau's landscape. Its tracks pass remarkably close to Walden Pond (Figure 2), and the Fitchburg Line—both its reality and the specter of it—is practically a character in his writing: "I usually go to the village along its causeway, and am, as it were, related to society by this link," Thoreau writes in "Sounds," a chapter of *Walden* that contains what must be one of the most picturesque odes (or laments) to rail travel and commerce in all of American literature: The engine's whistle, Thoreau complains, pierces the still silence of his idyllic retreat like a screaming hawk circling a farmer's field, its billows of steam an ominous harbinger of "this travelling demi-god, this cloud-compeller."<sup>1</sup>

Thoreau's frequent, customary walks into Concord along the railroad tracks took him through a heavily excavated stretch of the line known as the Deep Cut, to which he returned again and again each year in early spring, even after leaving the cabin, to observe and to record his observations. The leaf-shaped sand flows and trickling surface erosion caused by melting frost in the banks of the Deep Cut are elaborately described in Thoreau's chapter in *Walden* entitled "Spring," what Laurence Buell calls the "high point of Thoreau's epic."<sup>2</sup> And yet, in spite of the universal acclaim of this passage as a literary *tour de force*, it has not received the full attention it deserves. What warrants fresh consideration first and foremost is "Spring"'s deep-rootedness in classical sources. Many classical influences, allusions, and a good deal of etymological word play have gone so far unnoticed. The chapter is also important because it describes, by intimation, what contemporary scientists now call *emergence*. Emergent phenomena are properties or behaviors that arise in systems as a result of complex, dynamic interactions amongst constituent parts, including changes to a system brought about by human interventions<sup>3</sup>—not only, e.g., climate change and wildfires, but also traffic patterns and terrorist networks; kidney function in the body; the rings of Saturn. As he tries to capture the essence of the

Deep Cut and interpret its significance, Thoreau adumbrates this concept, but also grapples ingeniously with broader issues of perennial concern—the relationship of Nature to Culture, for example, of Wilderness to Civilization, of Science to the Humanities—making “Spring” not only a probing work of eco-criticism and environmental philosophy, but of scientific reflection and poetic experiment as well. In short, Thoreau’s “Spring” is that rare work of classical reception that transmits both literary and scientific insight.

Perhaps at this point, in lieu of accolades, it is best to let Thoreau start speaking for himself.

What I offer in the following pages is a commentary on the Deep Cut passage from “Spring.” Classical references and aspects of systems theory will be explained and contextualized as they emerge, as it were, from Thoreau’s text. The whole chapter corresponds to pages 289–308 in Cramer’s edition of *Walden*—26 paragraphs all told, of which only the relevant ones are printed and annotated here. (Transitions and extraneous material are briefly summarized, as needed, in paraphrase.) In order to preserve Thoreau’s train of thought (again, as it were), each paragraph is presented entire, without interruption, followed by lemmatized annotation and commentary. Hurried readers can parse the commentary first and engage Thoreau’s text directly on points of interest. However, as Thoreau drafted and revised this passage about the Deep Cut nearly a dozen times before its inclusion in *Walden* inasmuch as it represented for him the *denouement* of the entire work, his text invites, and repays, a close reading. Indeed, it is exactly the kind of work for which the commentary format—the Classicist’s stock in trade—is perfectly suited. As Thoreau himself says in his chapter from *Walden* entitled “Reading,” “Books must be read as deliberately and reservedly as they were written.”<sup>4</sup>

Few phenomena gave me more delight than to observe the forms which thawing sand and clay assume in flowing down the sides of a deep cut on the railroad through which I passed on my way to the village, a phenomenon not very common on so large a scale, though the number of freshly exposed banks of the right material must have been greatly multiplied since railroads were invented. The material was sand of every degree of fineness and of various rich colors, commonly mixed with a little clay. When the frost comes out in the spring, and even in a thawing day in the winter, the sand begins to flow down the slopes like lava, sometimes bursting out through the snow and overflowing it where no sand was to be seen before. Innumerable little streams overlap and interlace one with another, exhibiting a sort of hybrid product, which obeys half way the law of currents, and half way that of vegetation. As it flows it takes the forms of sappy leaves or vines, making heaps of pulpy sprays a foot or more in depth, and resembling, as you look down on them, the lacinated, lobed, and imbricated thalluses of some lichens; or you are reminded of coral, of leopard's paws or birds' feet, of brains or lungs or bowels, and excrements of all kinds. It is a truly *grotesque* vegetation, whose forms and color we see imitated in bronze, a sort of architectural foliage more ancient and typical than acanthus, chiccory, ivy, vine, or any vegetable leaves; destined perhaps, under some circumstances, to become a puzzle to future geologists. The whole cut impressed me as if it were a cave with its stalactites laid open to the light. The various shades of the sand are singularly rich and agreeable, embracing the different iron colors, brown, gray, yellowish, and reddish. When the flowing mass reaches the drain at the foot of the bank it spreads out flatter into *strands*, the separate streams losing their semi-cylindrical form and gradually becoming more flat and broad, running together as they are more moist, till they form an almost flat sand, still variously and beautifully shaded, but in which you can trace the original forms of vegetation; till at length, in the water itself, they are converted into *banks*, like those formed off the mouths of rivers, and the forms of vegetation are lost in the ripple marks on the bottom.



the forms which thawing sand and clay assume: This is an allusion—in anticipation—to Ovid’s story of creation, which Thoreau quotes piecemeal in the Latin and in his own translation at ¶18 and 21 below (quoting *Metamorphoses* 1.61–62, 78–81, 89–96 and 107–108). There may also be a nod here to the tale of Deucalion and Pyrrha and the re-creation of human beings from stones tossed upon the post-diluvian Mother Earth, which Thoreau also quotes in Latin (*Metamorphoses* 1.414–415), with Sir Walter Raleigh’s translation, in “Economy.” Those lines, however, are cited somewhat less favorably there as an instance of “blind obedience to a blundering oracle” among “men [who] labor under a mistake . . . laying up treasures which moth and rust will corrupt and thieves break through and steal” (alluding to Matthew 6:19–20).<sup>5</sup> And yet, while Thoreau readily and effectively alludes to the Bible throughout *Walden*, as in the foregoing passage, and knew from his own research that the name Adam, for example, derives from the Hebrew word meaning “Earth,” it is not correct to say of this passage about the Deep Cut, as does Buell, that Thoreau “breathes life into the biblical formula of humankind’s earthly origins.”<sup>6</sup> To the contrary, Thoreau’s vision of creation here is distinctly unbiblical. It is self-consciously classical, as his invoking of Ovid makes palpably clear. As he puts it later in ¶18, with characteristic wordplay, “the coming in of spring is like the creation of Cosmos out of Chaos” (on this formulation, see further below). Creation by biblical *fiat* or *ex nihilo* is something quite different from the emergentism that Thoreau is describing here.

There is also an imagistic glimpse in this overture—a bit blurry in the background perhaps—of sculpture wrought from clay. Compare ¶8 below, where the sand flow is said to be “like clay in the hands of the potter” and Thoreau wonders “What is man but a mass of thawing clay?” Ovid, at any rate, offers a vivid simile for human creation from the plastic arts in that same Deucalion and Pyrrha episode (*uti de marmore coepta*, etc.: *Metamorphoses* 1.405) that Thoreau

knew well enough to quote not only in *Walden's* first chapter, "Economy," but also in a pre-*Walden* lecture delivered at the Concord Lyceum, February 8, 1843.<sup>7</sup> Sculptural or not, Thoreau will wax architectural soon enough in his description of "grotesque vegetation" later in this paragraph (see comments *ad loc.*).

The notion of "Cosmos" emerging from "Chaos" (cosmos means "order" in Greek) is a literary borrowing via Ovid from Hesiod (*Metamorphoses* 1.5–7: *ante mare et terras et quod tegit omnia caelum / unus erat toto naturae vultus in orbe / quem dixere chaos*; cf. *Theogony* 116). Thoreau's evocation of Ovid, combined with his use of the word "Cosmos" in marked uppercase in ¶18, underscores that his account of creation in "Spring" is not only poetic and mythological, but harks back to the speculative, proto-scientific research of the Presocratics, as indeed does Ovid's own.<sup>8</sup>

**a phenomenon not very common on so large a scale:** Size matters, as does scale, in complex systems, as does the relationship of macrocosm to microcosm and of parts to whole as Thoreau's statement here implies. The man-made sand-bank created the conditions for Nature to run its course as it does without human interference on smaller scales elsewhere under similar conditions. In ¶2 of "Spring," Thoreau makes some profound and perceptive remarks about scale sprung from his close and systematic observation of *Walden's* environs: "The phenomena of the year take place every day in a pond on a small scale." "The day is an epitome of the year." "The largest pond is as sensitive to atmospheric changes as the globule of mercury in its tube."<sup>9</sup>

**greatly multiplied since railroads were invented:** The Railroad, a product of Culture, produces in turn a marvel of Nature; Thoreau encounters this natural wonder while walking from the Wild to the village, his track, paradoxically, the steel trappings and wooden ties of industry. The *mise-en-scène* of the Deep Cut is reminiscent of Edward Byrtny's

panoramic photographs of junk heaps, factory sprawl, extraction pits, and toxic wastelands: Beautiful, natural-looking forms and patterns emerge from industrial detritus and decay and the photographs convey an eerie, Ansel Adams-like sublimity, in spite of the human exploitation of Nature that they depict.<sup>10</sup>

Complex systems and their attendant properties and behaviors can occur naturally or be man-made. Complexity is at work in transit systems and termite mounds, rainforests and rent-controlled neighborhoods. Thoreau himself observes in ¶8 that human institutions often resemble the dynamical systems of the Earth. Both, he says, are “plastic.” At the close of ¶9 he goes further: “The whole tree itself is but one leaf, and rivers are still vaster leaves whose pulp is intervening earth, and towns and cities are the ova of insects in their axils.” (See further comments *ad loc.* below)

That the Fitchburg Railroad could inadvertently be a source for new, emergent phenomena in Nature has an instructive modern parallel in the dormant slag heaps or terrils of the Nord-Pas de Calais region of France, which in 2012 joined the Pyramids of Egypt as a UNESCO World Heritage site. Hundreds of terrils, some of them as tall as 150 meters, are scattered amongst now deserted model cities, which were purpose-built as utopian worker communities in the 19th and early 20th centuries to support the region’s three-hundred-year-old coal mining industry. UNESCO describes the Nord-Pas de Calais Mining Basin as a precious, “organically evolved” cultural landscape “uniquely representing the combined work of nature and of man.” A new and vibrant ecosystem has taken hold on the terrils since active mining ceased in the 1960s. In the village of Rieulay, for example, a goat farmer has put down roots and built *Chevrerie des Terrils* (“Slag-heaps Goat Farm”). He grazes his animals on the spoil tips, which produce brushy fodder that is ideal for goats. A vintner has established a vineyard amongst the so-called “overburden” and coal “tailings.” It is France’s northernmost estate and produces a fine “Charbonnay.” The



growing conditions are reportedly superb for vines: The gravelly black soil promotes good drainage and retains heat. Ecosystems are fragile, to be sure, but Nature is resilient. As one resident puts it, "At the end of the day, what is a terril but a hill of stones which we took from nature, from underground? Well now we are giving it back to nature. And nature then gives it back to us once again, by bringing flowers, and trees, and animals."<sup>11</sup>

**a sort of hybrid product . . .** : This attempt to describe the similar behavior of seemingly unlike things nearly captures the essence, *mutatis mutandis*, of modern physics' discovery of the wave-particle duality of light and Niels Bohr's consequent notion of "complementarity" to explain it.<sup>12</sup> The powers of observation brought to bear—in Thoreau's case the naked eye, in Bohr's and his colleagues' case a particle accelerator and various measuring devices and data processing machines—are both fundamentally empirical and scientific. What I find remarkable about this whole passage about the Deep Cut is that Thoreau is seeing and identifying complexity for what it is with his own eyes. He is closely and carefully observing—also measuring and sampling (as entries in his journals show)—but there is no laboratory needed for his work, and no computer. To the contrary, he compares standing there and looking at the Deep Cut to being "in the laboratory of the Artist who made the world . . . strewing his fresh designs about" (¶7). Thoreau's method and its ability to produce scientifically accurate descriptions and valid theorization is exactly what was available to the ancient Greeks. We see parallels in Xenophanes of Colophon drawing the inference from seeing marine fossils in the rock of land-locked quarries that water must once have been there.<sup>13</sup> We see it, too, in the observation of the behavior of self-organizing whirlpools and vortices, which struck several early cosmologists (Anaximander, Empedocles, Democritus, and others) as an apt analog for the creation and formation of the universe—an observation that has since been corrob-

orated by modern science.<sup>14</sup> This kind of observation and reasoning by analogy, as Douglas Hofstadter and Emmanuel Sander contend in a recent, massive tome on the topic, is a fundamental trait of human cognition generally, not just of scientific investigation.<sup>15</sup>

**excrements of all kinds:** A supremely learned pun. Even West, whose *Transcendental Wordplay* is the Authorized Version on this subject, doesn't do it full justice.<sup>16</sup> The Latin word *excrementum* has two derivations: It comes primarily from *excerno*, literally "what is sifted out." Hence the meaning "refuse," "waste," or "feces." But another, distinct word *excrementum* derives from *exresco* ("to grow forth, rise up"). The entry in Forcellini's *Lexicon* (2nd edition 1831), to which Thoreau had access, makes this all very clear, as does Ainsworth's, which he owned.<sup>17</sup> By the time Thoreau's sentence here has unfolded, moving as it does from sappy leaves and vines, to pulpy sprays, imbricated thalluses, lichen, coral, leopard's paws and birds' feet, to brains, lungs and bowels, we realize that when Thoreau says "excrements of all kinds" he means the word in *both* senses (literally of *all kinds*), namely *out-growths*, a sense that fits the semantic domain of the animals and plants in the first half of the sentence, and *waste products*, which "brains," "lungs" and especially "bowels" call to mind. To call it a



Figure 3: Herbert Wendell Gleason. *Sand Foliage from Deep Cut on r.r. (railroad), Concord, Mass., March 17, 1900*. Courtesy Concord Free Public Library.

"truly *grotesque* vegetation" underscores the pun on "excrements" while creating another *double-entendre* hard on its heels involving the word *grotesque* (to be explained immediately below), to which attention is drawn by italicized font. Thoreau's eye and his pencil are both so sharp here that no comment is needed to show how visually apt and evocative these comparisons are. (Nonetheless, see Herbert Gleason's near-period photograph of Thoreau's sand foliage, Figure 3.) What is noteworthy—an idea embedded in the pun itself—is the equivalence or interdependence of growth and decay that these comparisons suggest and which Thoreau validates as integral, reciprocal agents of the same organic process.

**a truly grotesque vegetation:** The word "*grotesque*" also has two senses. In Thoreau's time, as today, it primarily meant "ugly" and connoted "disgusting" (in the way that excrement is disgusting). But its original meaning, from Italian *grottesco*, is "of or pertaining to a cave." The word was coined by artists and writers of the Italian Renaissance in conjunction with the accidental discovery—by then buried underground—of the emperor Nero's notorious Domus Aurea, or "Golden House." Painters like Raphael and Michelangelo, eager for inspiration from the past and armed with torches, were lowered down by ropes into cavities in the ground (across the street from where the Colosseum stands today) that contained colorful wall paintings with ornate vegetal borders and decorations. These "cavities," in fact, were actually rooms in the Domus Aurea, which had been buried long before (and intentionally so), first by Trajan, and then also by centuries of further destruction and construction above ground. That Thoreau has in mind the art-historical sense of *grotesque* is clear from his appeal to the "forms and color we see imitated in bronze, a sort of architectural foliage more ancient and typical than acanthus, chicory, ivy, vine, or any vegetable leaves." Today one can see the earliest and most influential adaptations of Nero's *grotesques* in Raphael's painted Loggias in the Vatican.

However, this kind of decoration also appears on Corinthian columns and on other architectural elements the world over. Eventually the style made its way across centuries from the palaces and temples of the great onto everyday household furniture. In “Sounds” Thoreau describes his first spring cleaning. He empties his cabin, putting all its furniture outside amidst the trees whilst he sweeps and muses puckishly: “A bird sits on the next bough, life-everlasting [a kind of flower] grows under the table, and blackberry vines run round its legs; pine cones, chestnut burs, and strawberry leaves are strewn about. It looked as if this was the way these forms came to be transferred to our furniture, to tables, chairs, and bedsteads,—because they once stood in their midst.” The image Thoreau conjures here is of decorative forms drawn from Nature emerging spontaneously on his furniture by virtue of its proximity to their source. “I did not remove the books and pen and ink,” he adds, inscribing himself into the scene, “standing amid the pines and hickories. They seemed glad to get out themselves, and as if unwilling to be brought in. I was sometimes tempted to stretch an awning over them and take my seat there.”<sup>18</sup>

**a puzzle to future geologists:** A puzzle no longer. Robert Thorson’s *Walden’s Shore: Henry David Thoreau and Nineteenth-Century Science* (2014) is now the indispensable guide to the geodynamics of Walden Pond and a reliable account, too, of Thoreau’s debt to the then nascent field of geological science, namely the uniformitarianism of Hutton, Lyell, and their successors. Thorson, a professor of Geology at the University of Connecticut, offers a superb analysis of the sand foliage at the Deep Cut as a dissipative, emergent structure of the kind described by Nobel laureate Ilya Prigogine.<sup>19</sup> Given his summons to geologists from the future, Thoreau’s comparison of the sand flow in deep time leaving in its wake bronze artifacts and architectural columns decorated with vegetal motifs presents an image both of fossils and of archaeology.

The whole cut . . . : "cut" primarily as in Deep Cut, i.e., of the bank itself, but also perhaps, given the comparisons to the decorative arts, "woodcut" or "linoleum cut" is also in play, especially with the word "impress."

**strands:** Another pun, preparatory to the riot of sustained, etymological wordplay to come in the next two paragraphs. As the sand changes into a slurry, the word deforms as well: sand becomes *strands* become *banks*.

## ¶7

The whole bank, which is from twenty to forty feet high, is sometimes overlaid with a mass of this kind of foliage, or sandy rupture, for a quarter of a mile on one or both sides, the produce of one spring day. What makes this sand foliage remarkable is its springing into existence thus suddenly. When I see on the one side the inert bank—for the sun acts on one side first—and on the other this luxuriant foliage, the creation of an hour, I am affected as if in a peculiar sense I stood in the laboratory of the Artist who made the world and me—had come to where he was still at work, sporting on this bank, and with excess of energy strewing his fresh designs about. I feel as if I were nearer to the vitals of the globe, for this sandy overflow is something such a foliaceous mass as the vitals of the animal body. You find thus in the very sands an anticipation of the vegetable leaf. No wonder that the earth expresses itself outwardly in leaves, it so labors with the idea inwardly. The atoms have already learned this law, and are pregnant by it. The overhanging leaf sees here its prototype. *Internally*, whether in the globe or animal body, it is a moist thick *lobe*, a word especially applicable to the liver and lungs and the *leaves* of fat (λείβω, *labor*, *lapsus*, to flow or slip downward, a lapsing; λοβος, *globus*, lobe, globe; also lap, flap, and many other words); *externally* a dry thin leaf, even as the *f* and *v* are a pressed and dried b. The radicals of lobe are lb, the soft mass of the b (single lobed, or B, double lobed), with the liquid *l* behind it pressing it forward. In globe, *glb*, the guttural *g* adds to the meaning the capacity of the throat. The feathers and wings of birds are still drier and thinner leaves. Thus, also, you

pass from the lumpish grub in the earth to the airy and fluttering butterfly. The very globe continually transcends and translates itself, and becomes winged in its orbit. Even ice begins with delicate crystal leaves, as if it had flowed into moulds which the fronds of waterplants have impressed on the watery mirror. The whole tree itself is but one leaf, and rivers are still vaster leaves whose pulp is intervening earth, and towns and cities are the ova of insects in their axils.

**springing into existence thus suddenly:** *Emergence*; with play on the word “spring.”

**in the very sands an anticipation of the vegetable leaf:** Thoreau read Goethe’s *Italian Journey*, in German, in 1837. In that work, Goethe describes an epiphany he experienced during an extended trip to Italy that had impelled him to write the *Metamorphosis of Plants*, published earlier in 1790, a work Thoreau had also read. “While walking in the Public Gardens of Palermo,” Goethe writes in *Italian Journey*, “it came to me in a flash that in the organ of the plant which we are accustomed to call the leaf lies the true Proteus who can hide or reveal himself in all vegetal forms. From first to last the plant is nothing but leaf.”<sup>20</sup> The morphology of the *Urpflanze*, or archetypal plant, became Goethe’s focus in the *Metamorphosis*, where he argues that the parts of plants are but leaves transformed: “We will not fail to recognize the leaf form in seed vessels—regardless of their manifold formations, their particular purpose and context. Thus, for example, the pod may be viewed as a single folded leaf with its edges grown together, husks as consisting of leaves grown more over one another, and compound capsules may be understood as several leaves united round a central point with their inner sides open toward one another and their edges joined” (§78). Gordon Miller’s meticulous modern photographs of the plants and flowers Goethe describes in various stages of bloom (in the MIT edition of Goethe’s *Metamorphosis*) reveal just how uncanny, visually, Goethe’s homologies are.<sup>21</sup> Thoreau subscribes to Goethe’s methods



and conclusions—he declares below that “the whole tree itself is but one leaf”—but he seeks to root his discovery in the soil (“the very sands”) and to articulate the effects of water on growth. For other echoes and allusions to Goethe in the Deep Cut, see comments ad loc. in ¶¶8 and 9 below.

**atoms . . . pregnant by it:** The word “pregnant,” arising from “labors” and “inwardly,” creates a vivid picture of the internal, molecular structure of organisms. Given that human beings are also by-products—literally and figuratively—of this same atomic “law” (see the extended metaphor at the end of ¶8), the image of pregnancy is weirdly suggestive of a homunculus. Note the strong alliteration on the headwords “leaves . . . labors . . . learned . . . law.”

**prototype . . . :** This flourish of linguistic and etymological wordplay is a carefully constructed set-piece in which sound and sense coalesce to literally formulate the argument. Most editors and commentators do not give this section its due. A notable exception is West.<sup>22</sup> Wilson and Root are also good, but neither is, as it were, *thorough*.<sup>23</sup>

The calculating play on the orders and classes of consonants in this passage is relentless and spellbinding. First, Thoreau establishes a contrasting, yet complementary relationship between inner and outer, which is structured chiasmatically: “the earth expresses itself outwardly [A] in leaves [B], it so labors [B<sup>I</sup>] with the idea inwardly [A<sup>I</sup>],” where A and A<sup>I</sup> are related semantically as antonyms and B and B<sup>I</sup> are connected not only by alliteration, but also, as Thoreau is about to expound (if not explicitly explain), by their phonetic “radicals” *l-v* and *l-b*, the *v* of which is a voiced labiodental fricative (IPA no. 129), while the *b* is a voiced bilabial form of the same consonant/sound (IPA no. 102). The initial-letter alliteration and consonantal Ablaut proliferate in the heap of English, Greek, and Latin words that follow. Of these, the word

“leaf”—with its voiceless labiodental fricative *f* (IPA no. 128)—is associated with external expression; it is “dry” and “thin,” in contrast to the “fat,” “thick,” and “moist” organs that have generated it. The extraordinarily self-conscious quality of Thoreau’s thinking and writing here is revealed in the allusion to the pressing and drying of leaves in books (“even as the *f* and *v* are a pressed and dried *b*”), which themselves, he says metaphorically—not once, but two times in ¶8 and twice again in ¶9—have leaves. (Thoreau, in fact, regularly and systematically collected, pressed, and labeled specimens of leaves and grass. He willed 800 of them to the Concord Free Public Library at his death—the bulk of which is now kept at Harvard.<sup>24</sup>) Fat, too—a soft substance—has leaves, and crystals, a hard substance, he says with only slight semantic stretch, have them as well. Goethe’s *Ur-leaf* is being conjured before our very eyes.

As it happens, Thoreau etymologizes the word *lobe* in this passage incorrectly as an o-grade noun from the Greek verb λείβω (“to drip,” or “to flow”), hence a “droplet.” And the printing error that omitted the accent from the ultima of λοβός in Ticknor & Fields’ first edition of *Walden* was left to stand in Thoreau’s personal, hand-corrected copy, and so (presumably) persists in modern editions.<sup>25</sup> However, the pre-scientific etymology of λοβός that was available to Thoreau and his contemporaries notwithstanding, the word *lobe* (a visual metaphor) was and is still applied to droplet-shaped protuberances in organs and plants. *Lobe*, nearly a dead metaphor now in common usage, is returned, as it were, to its source here in Thoreau’s extended treatment of the melting sand-flow, the “liquid l behind it pressing it forward” like a drop of seeping water.

The introduction of the word *globe* to the scheme is explained by Thoreau himself: “In globe, *glb*, the guttural *g* adds to the meaning the capacity of the throat.” As West demonstrates in exhilarating detail, Thoreau gets the idea that guttural letters are “causative” (as much else in this passage) from a learned, but oddball work by an Hungarian émigré-turned-Boston-school-

master named Charles Kraitsir—*Glossology: Being a Treatise on the Nature of Language and the Language of Nature* (1852), portions of which Thoreau copied out by hand from a hard copy in Emerson's library, and whose related work, *Significance of the Alphabet* (1846), Thoreau owned a copy of himself. "Globe" makes explicit the cosmological implications of all this word-hoarding. The remarks on the "double lobed" version of the *b*-radical—i.e., upper-case B—adds a pictorial dimension to the stream of sounds and draws attention to a letter that will be employed momentarily to good effect. (See my next paragraph below.) Indeed, the phrase "double lobed" is a visual and phonetic palindrome. Even the use of "radical" here is not innocent of etymologizing, since the word stems from the Latin "root." As for "*lapsus* . . . slip . . . also lap, flap"—how can one ever recover from the sound effects of that?

The picture-making and extended metaphors continue unabated in the description of the feathers and wings of birds as leaves—"feathers" with an *f*, "birds" with a *b*, the feather a part to the wing's whole. But things literally metamorphose before our eyes and ears in the sentence "Thus, also, you pass from the lumpish grub in the earth to the airy and fluttering butterfly." This is another deft chiasm (ABBA)—chrysalis-like—with "earth" and "airy" comprising the contrasting B-elements and "grub" and "butterfly" the outer A-terms. That the butterfly is, biologically speaking, the embryonic realization of the grub underscores the link. Their intimate, organic relation is further reinforced by the terminal *b*-sound in "grub," the initial *b* in "butterfly," as if one is, as Thoreau puts it, "translating" itself into the other, and by the breathtaking internal assonance/alliteration of the two noun-adjective combinations: "fluttering butterfly"; "lumpish grub." If that were not clever enough, the grub is moist, the butterfly dry, and each word contains its corresponding labiodental (*b* and *f* respectively). Finally, the phrase "the very globe" sums up the extent of the butterfly's domain as it takes wing from earth to its airy abode in flight. "Orbit," used to describe its course, is yet another *b*-word,

and apposite to both butterflies and celestial globes.

Thoreau's cosmic etymologizing here stretches much further back than to his reading of Kraitsir and other 19th century compendiums: Lucretius proposes just these kinds of homologies between letters of the alphabet and the elements of Nature—the word *elementum* used for both—in *De Rerum Natura* (cf. 1.196–98). Poems, the implication is, are evolutionary, emergent structures analogous to the ones formed from atoms and molecules in Nature. Or, to take a slightly different angle, as Hadot puts it, the cosmogonic poet, like a scientist, “knows the universe's mode of production, or the way in which it was constituted.”<sup>26</sup>

The whole tree itself is but one leaf: Not just an allusion to Goethe, but an observation/proposition that has been verified by modern complexity science in the mathematical demonstration of the principle of self-similarity in Nature, represented visually by fractals<sup>27</sup> and, in Thoreau's day, by the meticulous drawings of biologist Ernst Haeckel in *Kunstformen der Natur* (published serially from 1899 to 1904).

**intervening:** Given Thoreau's propensity for etymological puns and all the talk of leaves and then of blood-vessels, “silicious matter,” and arteries (of rivers) immediately below in ¶8 (= an allegory about the formation of the human body), perhaps we are meant to hear also the homophone interveining: both word-stems are spelled *ven-* in Latin (“vein” < *vêna*, -ae, “blood-vessel”; “intervening” < *venîre*, “to come”), though the etymology of *vêna* is admittedly indeterminate.

**insects . . . axils:** an effective alliterative jingle to round out the thought.

## ¶8

When the sun withdraws the sand ceases to flow, but in the morning the streams will start once more and branch and branch again into a myriad of others. You here see perchance how blood-vessels

are formed. If you look closely you observe that first there pushes forward from the thawing mass a stream of softened sand with a drop-like point, like the ball of the finger, feeling its way slowly and blindly downward, until at last with more heat and moisture, as the sun gets higher, the most fluid portion, in its effort to obey the law to which the most inert also yields, separates from the latter and forms for itself a meandering channel or artery within that, in which is seen a little silvery stream glancing like lightning from one stage of pulpy leaves or branches to another, and ever and anon swallowed up in the sand. It is wonderful how rapidly yet perfectly the sand organizes itself as it flows, using the best material its mass affords to form the sharp edges of its channel. Such are the sources of rivers. In the silicious matter which the water deposits is perhaps the bony system, and in the still finer soil and organic matter the fleshy fibre or cellular tissue. What is man but a mass of thawing clay? The ball of the human finger is but a drop congealed. The fingers and toes flow to their extent from the thawing mass of the body. Who knows what the human body would expand and flow out to under a more genial heaven? Is not the hand a spreading palm leaf with its lobes and veins? The ear may be regarded, fancifully, as a lichen, umbilicaria, on the side of the head, with its lobe or drop. The lip—*labium*, from *labor*(?)—laps or lapses from the sides of the cavernous mouth. The nose is a manifest congealed drop or stalactite. The chin is a still larger drop, the confluent dripping of the face. The cheeks are a slide from the brows into the valley of the face, opposed and diffused by the cheek bones. Each rounded lobe of the vegetable leaf, too, is a thick and now loitering drop, larger or smaller; the lobes are the fingers of the leaf; and as many lobes as it has, in so many directions it tends to flow, and more heat or other genial influences would have caused it to flow yet farther.

**branch and branch:** A play on “branch,” proper primarily to “tree,” yet secondarily/ metaphorically to “streams” of sand. The metaphor is greatly expanded as the paragraph develops.

**artery:** Suggestive of “blood-vessel,” and also of the gradual emergence of humans from hard “silicious matter.” (Rock forms possess “veins” and so, by extension, “arteries.”)

**how rapidly yet perfectly the sand organizes itself:** Self-organization is one of the defining features of complex systems.<sup>28</sup>

What is man but a mass of thawing clay? Human anatomy, too, grows from the drips and drops of sand-flow. This playful, fanciful description, especially its recourse to rocks and stones, recalls natural formations like the “Old Man of the Mountain” at Franconia Notch, New Hampshire. First noted as a landmark in 1805, the Old Man—an apparent human profile formed naturally from eroded rock—became a popular tourist destination until he collapsed in 2003. It is not known if Thoreau ever saw the site with his own eyes, but other notable 19th century men of letters from New England did (Daniel Webster, for example, and Nathaniel Hawthorne). Thoreau’s imagery is also reminiscent of the Renaissance portraits painted by Giuseppe Arcimboldo, the most famous of which depicts Rudolph II, the Holy Roman Emperor, as Vertumnus, ancient Roman god of seasons who presided over gardens and orchards, the anatomy of whose face and torso is comprised entirely of fruits and vegetables. For the Ovidian influence here, see notes on ¶6 above and below on ¶¶18 and 21.

**umbilicaria:** also known as “rock tripe,” for the shape and texture this lichen assumes. Similarly, we speak picturesquely of a “cauliflower” ear. As it happens, both rock tripe and cauliflower are classic examples of fractal self-similarity in Nature.

**lip . . . laps . . . lapses, etc.:** The onomatopoeic repetition of p-sounds here and in the surrounding sentences (c- and t- as well) conveys the sound of dripping.

**The lip—labium, from labor(?):** Thoreau’s question mark happens to reflect the actual uncertainty among modern Indo-European philologists about the derivation and hence



relationship of these words—including *λοβός*. All, it would seem, come from a verb *labo*, “to waver,” but that is not yet satisfactorily demonstrable.

**face**, given the context, suggests a cliff or rock face.

## ¶9

Thus it seemed that this one hillside illustrated the principle of all the operations of Nature. The Maker of this earth but patented a leaf. What Champollion will decipher this hieroglyphic for us, that we may turn over a new leaf at last? This phenomenon is more exhilarating to me than the luxuriance and fertility of vineyards. True, it is somewhat excrementitious in its character, and there is no end to the heaps of liver, lights, and bowels, as if the globe were turned wrong side outward; but this suggests at least that Nature has some bowels, and there again is mother of humanity. This is the frost coming out of the ground; this is Spring. It precedes the green and flowery spring, as mythology precedes regular poetry. I know of nothing more purgative of winter fumes and indigestions. It convinces me that Earth is still in her swaddling-clothes, and stretches forth baby fingers on every side. Fresh curls spring from the baldest brow. There is nothing inorganic. These foliaceous heaps lie along the bank like the slag of a furnace, showing that Nature is ‘in full blast’ within. The earth is not a mere fragment of dead history, stratum upon stratum like the leaves of a book, to be studied by geologists and antiquaries chiefly, but living poetry like the leaves of a tree, which precede flowers and fruit—not a fossil earth, but a living earth; compared with whose great central life all animal and vegetable life is merely parasitic. Its throes will heave our exuviae from their graves. You may melt your metals and cast them into the most beautiful moulds you can; they will never excite me like the forms which this molten earth flows out into. And not only it, but the institutions upon it are plastic like clay in the hands of the potter.

**one hillside . . . all the operations of Nature**: microcosm and macrocosm; see the remarks on complexity and scale at ¶6.

**patented**: another pun; “patent,” from Latin *pateo*, “to

open, lay bare,” but also meant, with considerable *bathos*, in the conventional sense of a patent for a mechanical invention.

**What Champollion will decipher this hieroglyphic . . . ?:** The prodigy French linguist Jean Francois Champollion (1790–1832) cracked the Rosetta Stone when Thoreau was still a boy. Champollion’s discovery, a scholarly reflex of a wider Egyptomania in the air in the wake of Napoleon’s campaigns, was *au courant* in the intellectual circles of Thoreau’s place and time. The allusion here, however, is more deeply embedded in a pre-Champollionic tradition of reading the hieroglyphic “signatures” of Nature that stretches back to the early Modern period. Paracelsus, Sir Thomas Browne, and Jacob Boehme, among others, were leading exponents. Goethe invokes this tradition of reading Nature’s “code” in his introductory poem to the *Metamorphosis of Plants*. Addressing his wife, to whom the book was dedicated, Goethe characterizes his scientific treatise to her thus: “Name upon name assails thy ears and each / More barbarous-sounding than the one before . . . And so the choir hints a secret law / A sacred mystery.”<sup>29</sup> Novalis gives an even more expressive account of the doctrine. In *The Novices of Sais* (1802) the poet invites his initiands to “see strange figures emerge, figures which seem to belong to that great cipher which we discern written everywhere, in wings, eggshells, clouds and snow, in crystals and in stone formations, on ice-covered waters, on the inside and outside of mountains, of plants, beasts and men, in the lights of heaven, on scored disks of pitch or glass or in iron filings round a magnet, and in strange conjunctures of chance.”<sup>30</sup>

The view of Nature as a mysterious text to be deciphered appears, too, in the scientific polymath and explorer Alexander von Humboldt, who took both Americas, North and South, by storm at just this time, as Andrea Wulf’s recent blockbuster ably recounts.<sup>31</sup> Thoreau had read Humboldt’s *Essai sur la géographie des plantes* (1807) in German. In it

he would have seen the book's frontispiece engraving by Bertel Thorvaldsen that shows Apollo, lyre in hand, removing a veil from a statue of Isis depicted as Diana of the Ephesians *Polymaston* ("of many breasts"), a copy of Goethe's *Metamorphosis of Plants* at her feet.<sup>32</sup> (The German translation of Humboldt's *Essai*, also published in 1807, was dedicated to Goethe.) See Figure 4.

Thoreau's familiarity with the trope about Nature's hieroglyphs, and of Nature as a goddess unveiled by the arts of poetry and song, informs the imagery and wordplay of the following sentences, though the poet of Walden Pond takes a distinctly New England, no-nonsense approach to the theme. First there is the pun on "bowels," which is clearly meant in both its literal and figurative, biblical sense (biblical as in Colossians 3:12's "bowels of mercies" in the King James Version). However, the pun is, I suggest, compounded when Thoreau adds "as if the globe were turned the wrong side outward": Are we not to picture here concave *bowls*, which would be used to collect the "heaps" of organs when dressing, for example, poultry (as anyone who's done the deed would know)? That Thoreau's colloquialism "lights," meaning *lungs*, belongs to the idiom of offal (lungs, liver, heart, gizzards, kidneys)—and refers especially to the viscera of poultry—supports the suggestion.

The phrase "there is again mother of humanity" is equally suggestive and ambiguous. On the one hand, it clearly calls to mind Diana as beneficent Mother Nature.



Figure 4: Bertel Thorvaldsen, frontispiece to Alexander von Humboldt, *Ideen zu einer Geographie Pflanzen* (Tubingen: F.G. Cotta, 1807).

But—just possibly—given the words “excrementitious,” “bowels,” “vineyards,” and the images of fecundity and birth nearby, “mother” is meant also to suggest the slimy, placental-like “mother” that grows in vinegar (i.e., the oxidized bacterial substance that turns the alcohol of vineyards into acetic acid). That this suggestion is not so far-fetched as it might seem, consider the image of Earth in “swaddling-clothes” stretching forth “baby fingers” in the sentences immediately below. Mixed metaphors, to be sure, are hard, if not impossible, to unmix. What is more distinct, to me at least, is that Thoreau definitely has the Ephesian Diana in mind generally when he pictures “Mother Earth.” Earlier in “Spring,” for example, when describing his research and experiments on the frozen pond (¶2), Thoreau exults: “The earth is all alive and covered with papillae.” Cramer glosses *papillae* here correctly, yet also somewhat amusingly, missing the pun: “Tiny sensitive protruding cells, as in any small nipplelike protuberance of the body or small fleshy projection on a plant.”<sup>33</sup> Yet surely Thoreau is also thinking of the image of Diana of the Many Breasts (i.e., *papillae*).<sup>34</sup> In “Reading,” at any rate, he refers to her explicitly: “The oldest Egyptian or Hindoo philosopher raised a corner of the veil from the statue of the divinity,” he says, referring in the first instance to Isis, whose attributes and functions were conflated with Diana’s, as in Thorvaldsen’s frontispiece, which is modeled on ancient originals. None of this is to suggest that Thoreau was a Cabbalist, or that his references, although sincere and indicative of a worldview, are not at the same time all in good fun.

**excrementitious:** Thoreau’s qualification “somewhat,” combined with his connecting *exrementitious* to “the luxuriance and fertility of vineyards,” all but guarantees the pun on two senses of *excrement* proposed in the comments to ¶6 above, which is also in play here.

**as mythology precedes regular poetry:** Poetry and mythology in early Greek society comprise between them a dynamical

system of communication that shaped and was in turn shaped by Greek kinship structures and social institutions.<sup>35</sup> Cognitive linguists would speak of this phenomenon in terms of deep-structure and surface-structure, something Thoreau perhaps intimates by way of anticipation here in saying mythology "precedes" poetry.<sup>36</sup> At any rate, one would not go far wrong to say the ways in which Greek cult, institutions, poetic utterance, and mythology interact form a complex system—i.e., a self-perpetuating, self-augmenting, interactive semiotic network of signification and values designed to transmit cultural knowledge for survival to future generations.

**like the slag of a furnace:** see remarks on the terrils of Nordpas de Calais, ¶6 above.

**like the leaves of a book:** The simile states an unfavorable contrast here, unlike the use of the word *leaf* elsewhere in "Spring," as if a book were a dead thing compared to Nature itself.

**Its throes will heave our exuviae from their graves:** a sonorous collocation of *v*-words; *exuviae*, used especially of insect larvae, recalls the transformation of the lumpish grub into a butterfly.

#### ¶10

Ere long, not only on these banks, but on every hill and plain and in every hollow, the frost comes out of the ground like a dormant quadruped from its burrow, and seeks the sea with music, or migrates to other climes in clouds. Thaw with his gentle persuasion is more powerful than Thor with his hammer. The one melts, the other but breaks in pieces.

**Thaw . . . Thor:** A pun that works better in Bostonian brogue than in other dialects of American English. Thoreau here again finds his comparandum in pagan antiquity, not

biblical scriptures. The contrast between force and persuasion is also stark: Nature melts; Man (to the extent the anthropomorphic Thor stands for Culture) breaks in pieces. It is a deeply Romantic view. We hear an echo here perhaps of Thoreau himself, self-described earlier in this chapter (§2) as smacking the pond ice with his axe-head, Thor-like, to test its timbre and rigidity.<sup>37</sup>

[§§11-17]

*In these paragraphs Thoreau describes the myriad early signs of spring—the burgeoning of grasses and shrubs; the return of squirrels and honking geese; rushing brooks; birds and their birdcalls, etc.—in loving detail. Thoreau’s own melodious birdsong of words heralding the arrival of spring is the antitype to Rachel Carson’s “A Fable for Tomorrow,” Chapter 1 of her environmental classic, Silent Spring (1962): “There was a strange stillness,” Carson intones. “The birds, for example—where had they gone? Many people spoke of them, puzzled and disturbed. The feeding stations in the backyards were deserted. The few birds seen anywhere were moribund; they trembled violently and could not fly. It was a spring without voices. On the mornings that had once throbbed with the dawn chorus of robins, catbirds, doves, jays, wrens, and scores of other bird voices there was now no sound; only silence lay over the fields and woods and marsh.”*

This section of “Spring” is also notable for a quotation, in Latin and without translation, from Varro (*Res Rustica* 2.2.14): *et primitus oritur herba imbribus primoribus evocata* (“and the grass which is called forth by the early rains is just now growing”). It is as if, Thoreau says, “the earth sent forth an inward heat to greet the returning sun.” Compare the similar image in §9: “These foliaceous heaps lie along the bank like the slag of a furnace, showing that Nature is ‘in full blast’ within.”

Thoreau was fond of quoting the Roman agricultural writers as authorities. In “Where I Lived,” for example, he calls Cato’s *De Re Rustica* “my ‘Cultivator’”—a reference to a common title for agri-



*cultural trade magazines at the time (e.g., The Boston Cultivator, published weekly from 1841 to 1876).*<sup>38</sup>

## ¶18

As every season seems best to us in its turn, so the coming in of spring is like the creation of Cosmos out of Chaos and the realization of the Golden Age. —

*Eurus ad Auroram Nabathaeaque regna recessit,  
Persidaeque, et radiis iuga subdita matutinis.*

‘The East-Wind withdrew to Aurora and the Nabathean kingdom,  
And the Persian, and the ridges placed under the morning rays.

.....

Man was born. Whether that Artificer of things,  
The origin of a better world, made him from the divine seed;  
Or the earth, being recent and lately sundered from the high  
Ether, retained some seeds of cognate heaven.’

**Cosmos out of Chaos:** Order out of seeming chaos = complexity. See the remarks on ¶6 above.

**the realization of the Golden Age:** The quotations here, with Thoreau’s own translations, are from Ovid *Metamorphoses* 1.61–62 and 78–81. Ovid’s lines about the East-Wind seem to have been triggered by the comment at the end of the previous paragraph about winds blowing “to correct this slight oscillation of the poles and preserve the equilibrium of Nature.” Perhaps Thoreau is referring in some indistinct way to atmospheric circulation, or to the polar jet stream, both of which do indeed play a role in the overall equilibrium of the Earth’s climate. In any event, the larger context in Ovid is revealing. It concerns the unnamed *mundi fabricator* (i.e., Jupiter) putting an end to strife amongst the four sibling winds (Eurus, Zephyrus, Boreas, Auster) who would have torn the new universe apart, says Ovid (*quin lanient*

*mundum*), had not Jupiter assigned each their proper place. “So great,” he concludes, “is the discord among brothers” (*tanta est discordia fratrum*; line 60). That last editorializing phrase, which appears in the line immediately prior to the two lines Thoreau quotes here, is pregnant with an allusion to the civic discord of Ovid’s own time and foreshadows the Ages of Man myth he recounts at 89–150, where life in the Iron Age is characterized by the loss of common decency and the world descends into internecine, interfamilial strife (lines 126–150). Thoreau’s ellipse (. . .), I think, suggests not just the missing lines of a sequence, but is meant to evoke this larger context, especially in that he returns to the same passage again below in describing the Golden Age more fully (and with another ellipse) in ¶21 (see comments there).

## ¶19

A single gentle rain makes the grass many shades greener. So our prospects brighten on the influx of better thoughts. We should be blessed if we lived in the present always, and took advantage of every accident that befell us, like the grass which confesses the influence of the slightest dew that falls on it; and did not spend our time in atoning for the neglect of past opportunities, which we call doing our duty. We loiter in winter while it is already spring. In a pleasant spring morning all men’s sins are forgiven. Such a day is a truce to vice. While such a sun holds out to burn, the vilest sinner may return. Through our own recovered innocence we discern the innocence of our neighbors. You may have known your neighbor yesterday for a thief, a drunkard, or a sensualist, and merely pitied or despised him, and despaired of the world; but the sun shines bright and warm this first spring morning, recreating the world, and you meet him at some serene work, and see how it is exhausted and debauched veins expand with still joy and bless the new day, feel the spring influence with the innocence of infancy, and all his faults are forgotten. There is not only an atmosphere of good will about him, but even a savor of holiness groping for expression, blindly and ineffectually perhaps, like a new-born instinct, and for a short hour the south hill-side echoes to no vulgar jest. You see

some innocent fair shoots preparing to burst from his gnarled rind and try another year's life, tender and fresh as the youngest plant. Even he has entered into the joy of his Lord. Why the jailer does not leave open his prison doors—why the judge does not dismiss his case—why the preacher does not dismiss his congregation! It is because they do not obey the hint which God gives them, nor accept the pardon which he freely offers to all.

**We should be blessed if we lived in the present always:** Compare Seneca: *Nemo tantum praesentibus miser est* (*Letters* 5.9).

**confesses:** This word, only faintly metaphorical when predicated of grass, becomes more charged in light of the religious imagery that follows, where "In a pleasant spring morning all men's sins are forgiven." This whole paragraph, in fact, with its pageant of biblical phraseology is an Ode to Joy worthy of Schiller and Beethoven—and a worthy precursor, as well, to Nietzsche's interpretation of both that poem and its musical setting in *Birth of Tragedy* (1872). There is, in other words, in Thoreau's liturgical strains a resounding Dionysiac voice of redemption. (For the jailor, compare Acts 16:25–34 with Euripides, *Bacchae* 580–603.) The third item in Thoreau's three-fold, anaphoric crescendo of rhetorical questions—"why the preacher does not dismiss his congregation!"—plays brilliantly on the word dismiss: One thinks readily of the *Nunc Dimittis* of Evensong.

#### ¶20

'A return to goodness produced each day in the tranquil and beneficent breath of the morning, causes that in respect to the love of virtue and the hatred of vice, one approaches a little the primitive nature of man, as the sprouts of the forest which has been felled. In like manner the evil which one does in the interval of a day prevents the germs of virtues which began to spring up again from developing themselves and destroys them.'

'A return to goodness . . .': This and the first half of the next

paragraph are quotations from Mencius, which Thoreau read in Pauthier's French translation and translates into his own English here. Note how the sentiment reinforces Thoreau's point in the previous paragraph, made there with a mixture of Christian and Dionysian imagery, with an additional appeal to a non-Christian author from the Far East.

## ¶21

'After the germs of virtue have thus been prevented many times from developing themselves, then the beneficent breath of evening does not suffice to preserve them. As soon as the breath of evening does not suffice longer to preserve them, then the nature of man does not differ much from that of the brute. Men seeing the nature of this man like that of the brute, think that he has never possessed the innate faculty of reason. Are those the true and natural sentiments of man?'

'The Golden Age was first created, which without any avenger  
Spontaneously without law cherished fidelity and rectitude.  
Punishment and fear were not; nor were threatening words read  
On suspended brass; nor did the suppliant crowd fear  
The words of their judge; but were safe without an avenger.  
Not yet the pine felled on its mountains had descended  
To the liquid waves that it might see a foreign world,  
And mortals knew no shores but their own.

.....

There was eternal spring, and placid zephyrs with warm  
Blasts soothed the flowers born without seed.'

'The Golden Age . . .': Ovid *Metamorphoses* 1.89–96 and 107–108, again in Thoreau's own translation. The translation itself, like Thoreau's other renditions of Latin in *Walden*, is a tad school-boyish. But that is neither here nor there. His thought is rather more sophisticated, and his purpose in quoting these lines is apparent from the context of the Ovid quotations discussed in ¶18. Again, the ellipse invites us to consider that larger context.

The Golden Age is a mythological scheme derived from

Hesiod (*Works & Days* 109–120). It is an age of spontaneous growth in Nature and harmonious concord in the realm of Culture. It is notable for human beings' lack of need for the accoutrements, technologies, and institutions of more advanced stages of (decadent) civilization. (This is indicated in Ovid's original by a spate of repeated negatives.) The Golden Age is essentially a utopian myth, like, e.g., William Morris's *Dream of John Ball* (1888) or *News from Nowhere* (1890)—a heuristic exercise in envisioning what the world used to be or could be like under different initial conditions, premises, and assumptions.

For Thoreau, Ovid's depiction of the Golden Age reinforces his own vision of the "brotherhood of man" as set forth in the quotations from Mencius in ¶¶20–21 and in his own biblicizing idiom in ¶19. Given the title and topic of this chapter—"Spring"—Ovid's phrase *ver erat aeternum* ("there was eternal spring") may have been what brought the whole passage to mind in the first place.

## [¶¶22–23]

*These two paragraphs describe further signs of spring in late April. Thoreau recounts the arrival of new birds and small mammals while fishing on the Pond. He catches "a rare mess of golden and silver and bright cupreous fishes, which looked like a string of jewels" and feels wholly alive basking in the light of spring. "O Death, where is thy sting?" he sings in triumph (1 Corinthians 15:55). "O Grave, where was thy victory, then?"*

## ¶24

Our village life would stagnate if it were not for the unexplored forests and meadows which surround it. We need the tonic of wildness—to wade sometimes in marshes where the bittern and the meadow-hen lurk, and hear the booming of the snipe; to smell the whispering sedge where only some wilder and more solitary fowl builds her nest, and the mink crawls with its belly close to the

ground. At the same time that we are earnest to explore and learn all things, we require that all things be mysterious and unexplorable, that land and sea be infinitely wild, unsurveyed and unfathomed by us because unfathomable. We can never have enough of nature. We must be refreshed by the sight of inexhaustible vigor, vast and titanic features, the sea-coast with its wrecks, the wilderness with its living and its decaying trees, the thunder-cloud, and the rain which lasts three weeks and produces freshets. We need to witness our own limits transgressed, and some life pasturing freely where we never wander. We are cheered when we observe the vulture feeding on the carrion which disgusts and disheartens us, and deriving health and strength from the repast. There was a dead horse in the hollow by the path to my house, which compelled me sometimes to go out of my way, especially in the night when the air was heavy, but the assurance it gave me of the strong appetite and inviolable health of Nature was my compensation for this. I love to see that Nature is so rife with life that myriads can be afforded to be sacrificed and suffered to prey on one another; that tender organizations can be so serenely squashed out of existence like pulp—tadpoles which herons gobble up, and tortoises and toads run over in the road; and that sometimes it has rained flesh and blood! With the liability to accident, we must see how little account is to be made of it. The impression made on a wise man is that of universal innocence. Poison is not poisonous after all, nor are any wounds fatal. Compassion is a very untenable ground. It must be expeditious. Its pleadings will not bear to be stereotyped.

**We need the tonic of wildness:** This whole paragraph reeks of Dionysian ecstasy and excess. In his essay “Walking,” originally composed and delivered as a lecture to the Concord Lyceum in 1851 but reworked for performance and eventual posthumous publication over ten years subsequently, Thoreau famously declares with sententious flair that “In Wildness is the preservation of the World”:

Every tree sends its fibers forth in search of the Wild. The cities import it at any price. Men plow and sail for it. From the forest and wilderness come the tonics and barks which brace mankind. Our ancestors were savages. The story of Romulus and Remus being

suckled by a wolf is not a meaningless fable. The founders of every state which has risen to eminence have drawn their nourishment and vigor from a similar wild source. It was because the children of the Empire were not suckled by the wolf that they were conquered and displaced by the children of the northern forests who were.

Joseph Wood Krutch, an environmentalist writer working about the time systems science was coming into its own (which was called then "cybernetics"), saw Thoreau's view of Nature in "Walking" as an anticipation of a paradigm shift: "A very popular concept today," Krutch wrote in 1963, "is embodied in the magic word cybernetic—or self-regulating. 'Feedback' is the secret of our most astonishing machines. But the famous balance of Nature is the most extraordinary of all cybernetic systems. Left to itself it is always self-regulated."<sup>39</sup>

Implicit, if often unrecognized and unsaid, in the observation that Nature is a self-regulating system is the existential and moral problem of our place in it. In this regard, Thoreau's anticipation of Nietzsche, I would suggest, is even more profound. In this paragraph from *Walden* we hear Thoreau exude: "We can never have enough of nature." "We need to witness our own limits transgressed." "We must be refreshed by the sight of inexhaustible vigor, vast and titanic features." These could be sentences from the *Birth of Tragedy*. In *Beyond Good and Evil* (1886), Nietzsche's tone is less celebratory of Nature's titanic vigor than it is in *Birth*. In *Beyond* he calls out the Stoics for their doctrine of "living according to Nature" with words relevant to what I take to be Thoreau's larger point here:

You desire to LIVE 'according to Nature'? Oh, you noble Stoics, what fraud of words! Imagine to yourselves a being like Nature, boundlessly extravagant, boundlessly indifferent, without purpose or consideration, without pity or justice, at once fruitful and barren and uncertain: imagine to yourselves INDIFFERENCE as a power—how COULD you live in accordance with such indifference? To live—is not that just endeavouring to be otherwise than this Nature? Is not living valuing, preferring, being unjust, being

limited, endeavouring to be different? And granted that your imperative, 'living according to Nature,' means actually the same as 'living according to life'—how could you do DIFFERENTLY? Why should you make a principle out of what you yourselves are, and must be? In reality, however, it is quite otherwise with you: while you pretend to read with rapture the canon of your law in Nature, you want something quite the contrary, you extraordinary stage-players and self-deluders! In your pride you wish to dictate your morals and ideals to Nature . . . to see Nature FALSELY . . . But this is an old and everlasting story: what happened in old times with the Stoics still happens today, as soon as ever a philosophy begins to believe in itself. It always creates the world in its own image; it cannot do otherwise.<sup>40</sup>

For all his paradoxes and coloratura, Thoreau, too, seems awake nonetheless to the pitfalls and dishonesty of any simplistic, uncritical embrace of Nature in its awesome totality. (Not that the Stoics represent that, but that is an argument for another occasion.) We need a *tonic* of wildness, Thoreau says—a medicinal—but along with it an underlying, sober respect for what he calls "the strong appetite and inviolable health of Nature." A putrid horse, a vulture gorging itself on carrion, creatures "squashed out of existence like pulp," tiny tadpoles quaffed down whole, toads and turtles splotched on the road are all quotidian signs of Nature's prodigality—"so rife with life," Thoreau reflects, "that myriads can be afforded to be sacrificed." The thought of prodigal Nature is perhaps, as he says, a "compensation" for the experiential reality of such things, but it provides no consolation. As Thoreau says in "Economy," "The better part of the man is soon ploughed into the soil for compost."<sup>41</sup> Whitman's poem "This Compost," published a few short years after *Walden* appeared, goes a long way toward reconciling these two views of Nature—Nature as a life-affirming, self-regulating organism on the one hand, and, simultaneously, a monstrous, amoral, indifferent, voracious usurper on the other: "Behold this compost!" Whitman exclaims. "What chemistry!" he says of Earth, contemplating the innumerable



corpses buried in the ground since the Descent of Man: "That it will not endanger me with the fevers that have deposited themselves in it, / That the cool drink from the well tastes so good, / That blackberries are so flavorful and juicy, / That when I recline on the grass I do not catch any disease, / Though probably every spear of grass rises out of what was once a catching disease. / It grows such sweet things out of such corruptions."<sup>42</sup>

**unsurveyed:** Ironically, or perhaps, rather, revealingly, Thoreau made his living as a land surveyor.<sup>43</sup>

**the sea-coast with its wrecks:** In *Cape Cod*, published posthumously in 1865, Thoreau provides an eyewitness account of the wreck of the *St. John* outside of Cohasset Harbor in 1849. Surveying the scene of bodies and debris, he records his reaction: "On the whole it was not so impressive a scene as I might have expected. If I had found one body upon the beach in some lonely place, it would have affected me more. I sympathized rather with the winds and waves, as if to toss and mangle these poor human bodies was the order of the day. If this was the law of Nature, why waste any time in awe or pity?"<sup>44</sup>

**universal innocence:** A very condensed thought is introduced here that stretches the sense of both "universal" and "innocence." "Universal innocence" means not that everyone is innocent, but that the universe does not cause harm by malice or intent. Thoreau puts the same idea differently just moments before—significantly, using the language of insurance, accounting, or reckoning: "With liability to accident we must see how little account is to be made of it." In saying that "poison is not poisonous after all, nor are any wounds fatal" Thoreau approaches a view of Nature we find also in Heraclitus as a paradoxical unity of opposites held in tension, a world in which, as Heraclitus puts it, "justice is strife" and "the road up and down is one and the same."<sup>45</sup> The last three

sentences of this paragraph, cryptic on the surface, also Heraclitean in tone, become more transparent when one sees Thoreau's etymological plays on the leading words: "Compassion is a very untenable ground"—*untenable*, from Latin *teneo*, means here ground that "cannot be held or occupied" because it is not conducive to settlement, not that compassion is "unreasonable," or "illegitimate" in and of itself; "It must be expeditious"—*expeditious* as in compassion needs to "get out from underfoot" (*ex-pedio*) on such shifting sands; "Its pleadings will not bear to be stereotyped"—*stereotyped* (from Greek στερεός, "solid, firm" + τυπώω, "to stamp, impress") means literally that compassion's pleadings cannot be "impressed on a solid surface [i.e., ground]"—again, because that ground is "untenable." Together these three sentences comprise a copious redundancy, where the thought is not so much developed or advanced from one sentence to the next as reinforced. The general sentiment, and the principle that ethics must proceed from physics, accords closely with Heraclitus's doctrine of ἁρμονίη ('harmony') and that "everything flows" (πάντα ῥεῖ).<sup>46</sup>

[¶¶25–26]

*Early May sees the trees begin to bud and bloom; the loon returns to the Pond, with a host of other birds. "And so," Thoreau rues, "the seasons went rolling on into summer, as one rambles into higher and higher grass." Then, in fine, he concludes:*

Thus was my first year's life in the woods completed; and the second year was similar to it. I finally left Walden September 6th, 1847.

IN AN EARLY chapter of *Walden* entitled "Reading," Thoreau declares,

Men sometimes speak as if the study of the classics would at

length make way for more modern and practical studies; but the adventurous student will always study classics, in whatever language they may be written and however ancient they may be. For what are the classics but the noblest recorded thoughts of man? They are the only oracles which are not decayed, and there are such answers to the most modern inquiry in them as Delphi and Dodona never gave. We might as well omit to study Nature because she is old. 47

This remarkable statement, which places the study of ancient literature on par with contemporary research in science—both pursuits necessarily taking the long view of things—is telling of Thoreau's overall method and disposition. His verdict is reminiscent of Aristotle's observation that "Nature is not a series of unconnected episodes, like a bad tragedy" (*Metaphysics* 1090b19),<sup>48</sup> which also hangs low from the branch, ripe for the picking, linking as it does two traditionally separate domains of inquiry, that of the humanities (i.e., poetics and interpretation) and the hard sciences. In the Deep Cut, Thoreau confounds these two domains in a sustained attempt to describe and understand a complex, naturally-occurring, yet man-made phenomenon, having recourse only to his own powers of observation, his talents as a writer, and his deep familiarity with classical literature and the classical tradition. The result of his efforts recalls another of Aristotle's maxims—"the whole is something besides its parts" (*Metaphysics* 1045a9)<sup>49</sup>—which, as it happens, is regularly invoked in complexity circles as an anticipation of the emergence-concept, one of the field's cornerstone doctrines. In an age like ours dominated by the STEM disciplines, the relevance of ancient thought to contemporary concerns, including scientific pursuits, is usually thought to be negligible or a dubious prospect at best. And yet Thoreau—himself equal parts observing scientist and literary scholar—turns this false dichotomy on its head: In the Deep Cut, he offers up a profound account of a beautifully strange, emergent phenomenon. In the course of doing so, he presents perhaps the best possible case for the ongoing relevance of the Classics in contemporary discourse.

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## NOTES

1. All citations from *Walden* correspond to the pagination in Jeffrey S. Cramer, *Walden: A Fully Annotated Edition* (New Haven and London 2004); here, 113.

2. Laurence Buell, *The Environmental Imagination: Thoreau, Nature Writing, and the Formation of American Culture* (Cambridge, MA 1995). 170).

3. For a comprehensive overview of systems science, see Fritjof Capra & Pier Luigi Luisi, *The Systems View of Life: A Unifying Vision* (Cambridge 2014). For complex systems in particular, see Neil Johnson, *Simply Complexity: A Clear Guide to Complexity Theory* (London 2009). Stuart Kauffman, *At Home in the Universe: The Search for Laws of Self-Organization and Complexity* (Oxford and New York 1995) provides a perspective from the biological sciences. Brian Castellani's genealogical chart of the history and disciplinary configurations of complexity studies is especially helpful and can be accessed at [www.art-sciencefactory.com/complexity-map\\_febo9.html](http://www.art-sciencefactory.com/complexity-map_febo9.html).

4. Cramer (note 1), 99.

5. Cramer (note 1), 3.

6. Buell (note 2), 171.

7. The lecture was entitled "The Life and Character of Sir Walter Raleigh." See Bradley P. Dean & Ronald Wesley Hoag, "Thoreau's Lectures before Walden: An Annotated Calendar," *Studies in the American Renaissance* (1995), 127–228; here 139–41.

8. See Claudia Zatta, "Plants' Interconnected Lives: From Ovid's Myths to Presocratic Thought and Beyond," *Arion: A Journal of Humanities and the Classics* 24.2 (2016), pp. 101–26.

9. Cramer (note 1), 291. A classic statement on qualitative changes attending changes of scale in complex systems is P. W. Anderson, "More Is Different," *Science*, N.S. 177.4047 (1972), 393–96.

10. Jennifer Baichwal, director, *Manufactured Landscapes* (Zeitgeist Films, 2007).

11. Nord-Pas de Calais: UNESCO official page: <http://whc.unesco.org/en/list/1360>; see also Henri Samuel, "France's slag heaps join Pyramids on list of UNESCO world treasures," *The Telegraph* (1 July, 2012). and Hugh

Schofield, "Making a vineyard out of slag-heap," *BBC News Magazine* (4 August, 2015).

12. See Neils Bohr, *Atomic Theory and the Description of Nature* [1934] (Cambridge 2011). For a brilliant graphic novel treatment of Bohr's life and thought, see Jim Ottaviani, *Suspended in Language: Niels Bohr's Life, Discoveries, and the Century He Shaped*, illustrated and lettered by Leland Purvis, et al., (G. T. Labs, 2nd edition, 2009). An image of the wave-particle duality of light was captured for the first time in 2015 and can be viewed here: [www.zmescience.com/science/physics/light-particle-wave-03032015](http://www.zmescience.com/science/physics/light-particle-wave-03032015);

13. Xenophanes = XEN. D22 in André Laks and Glenn W. Most (eds.), *Early Greek Philosophy* Vol. III, Loeb Classical Library no. 526 (Cambridge, MA 2016).

14. Ancient: John Ferguson, "ΔΙΝΟΣ," *Phronesis* 16.2 (1971), 97-115; modern: Philip S. Marcus, "Jupiter's Great Red Spot and Other Vortices," *Annual Review of Astronomy and Astrophysics* 31 (1993), 523-69, and Capra & Luisi (note 3), 176-81.

15. Douglas Hofstadter & Emmanuel Sander, *Surfaces and Essences: Analogy as the Fuel and Fire of Thinking* (New York 2013). See, too, G. E. R. Lloyd, *Analogical Investigations: Historical and Cross-cultural Perspectives on Human Reasoning* (Cambridge 2015). J. Robert Oppenheimer, "Analogy in Science," *American Psychologist* 11.3 (1956), 127-35, highlights the role of analogical thinking in the hard sciences from the perspective of a physicist.

16. Michael West, *Transcendental Wordplay: America's Romantic Puntsters and the Search for the Language of Nature* (Athens, OH 2000).

17. For the contents of Thoreau's personal library, see F. B. Sanborn, *The Life of Henry David Thoreau, Including Many Essays Hitherto Unpublished and Some Account of His Family and Friends* (Boston 1917), 505-17.

18. Cramer (note 1), 110.

19. Robert Thorson, *Walden's Shore: Henry David Thoreau and Nineteenth-Century Science* (Cambridge, MA 2014), 278-88.

20. Johann Wolfgang von Goethe, *Italian Journey*, trans. W. H. Auden and Elizabeth Mayer (London 1970), 366.

21. Johann Wolfgang von Goethe, *The Metamorphosis of Plants*, trans. Douglas Miller; introduction and photography, Gordon L. Miller (Cambridge, MA 2009).

22. West (note 16), 183-218.

23. Eric Wilson, "Thoreau, Thales, and the Distribution of Water," *The Concord Saunterer*, N.S., Vol. 7 (1998), 26-44; Christina Root, "The Proteus Within: Thoreau's Practice of Goethe's Phenomenology," *Janus Head* 8.1 (2005), 232-49.

24. Thoreau's specimens: <http://botlib.huh.harvard.edu/libraries/Thoreau.htm>.

25. Assessment based on personal autopsy of the book in the Davis Family Library's Department of Special Collections at Middlebury College (with thanks to archivist Joseph Watson).

26. Pierre Hadot, *The Veil of Isis: An Essay on the History of the Idea of Nature*, trans. Michael Chase [2004] (Cambridge, MA 2006), 207.

27. See Benoit B. Mandelbrot, *The Fractal Geometry of Nature* (New York 1982). For the mathematics behind fractals, see Capra & Luisi (note 3), 104–25), and in more detail, Heinz-Otto Peitgen, Hartmut Jürgens, & Dietmar Saupe, *Chaos and Fractals: New Frontiers of Science*, 2nd edition (New York 2004), 541–94.

28. Capra & Luisi (note 3), 144–54.

29. Goethe (note 21), 1.

30. Novalis, *The Novices of Sais*, illustrations by Paul Klee; trans. Ralph Manheim (Brooklyn, NY 2005), 3.

31. Andrea Wulf, *The Invention of Nature: Alexander von Humboldt's New World* (New York 2016).

32. Cramer (note 1), 97; the Hindu concept-divinity Maya ('Illusion') is the other reference here.

33. Cramer (note 1), 292.

34. A Diana Fountain in moss-covered stone at the 16th century Villa D'Este in Tivoli is constructed so that water spurts from the Goddess's nipples.

35. The so-called Myth-Ritualists champion this view. See Robert A. Segal, ed., *The Myth and Ritual Theory: An Anthology* (Malden, MA 1998), 1–13). Cf. H. S. Versnel, "Prospects," in *Transition and Reversal in Myth and Ritual* (Leiden 1993).

36. See Noam Chomsky, *The Logical Structure of Linguistic Theory* (Chicago and London 1985). Also Roman Jakobson, "Two Aspects of Language and Two Types of Aphasic Disturbances," in *On Language*, eds. Lind H. Waugh and Monique Monville-Burston [1956] (Cambridge, MA 1995); and M. A. K. Halliday, *An Introduction to Functional Grammar* (London 1985).

37. Cramer (note 1), 291.

38. Cramer (note 1), 81.

39. Joseph Wood Krutch, "In Wildness Is Preservation," *The Rotarian* 113:4 (1968), 38, originally appearing in *The Saturday Review* (8 June 1963).

40. Friedrich Nietzsche, *Beyond Good and Evil*, trans. R. J. Hollingdale; intro. Michael Tanner (London 1973), 30.

41. Cramer (note 1), 3).

42. "This Compost" was published in the 1856 edition of *Leaves of Grass*; some lines that are consecutive in the original have been elided in the quotation here.

43. Patrick Chura, *Thoreau the Land Surveyor* (Gainesville, FL 2012).

44. It is this passage that riled Kathryn Schulz to write a spirited, moralizing rant recently in *The New Yorker* entitled "Pond Scum." Kathryn Schulz, "Pond Scum: Henry David Thoreau's Moral Myopia," *The New Yorker*, October 19 issue, 2015.

45. HER. D63 and D51 in Laks & Most (note 13).

46. HER. D49 and D65c in Laks & Most (note 13).

47. Cramer (note 1), 98–99).

48. οὐκ ἔοικε δ' ἡ φύσις ἐπεισοδιώδης οὕσα ἐκ τῶν φαινομένων, ὥσπερ μοχθηρὰ τραγῳδία.

49. τὸ πᾶν . . . ἔστι τι τὸ ὅλον παρὰ τὰ μέρη.



