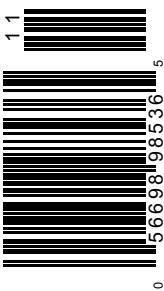
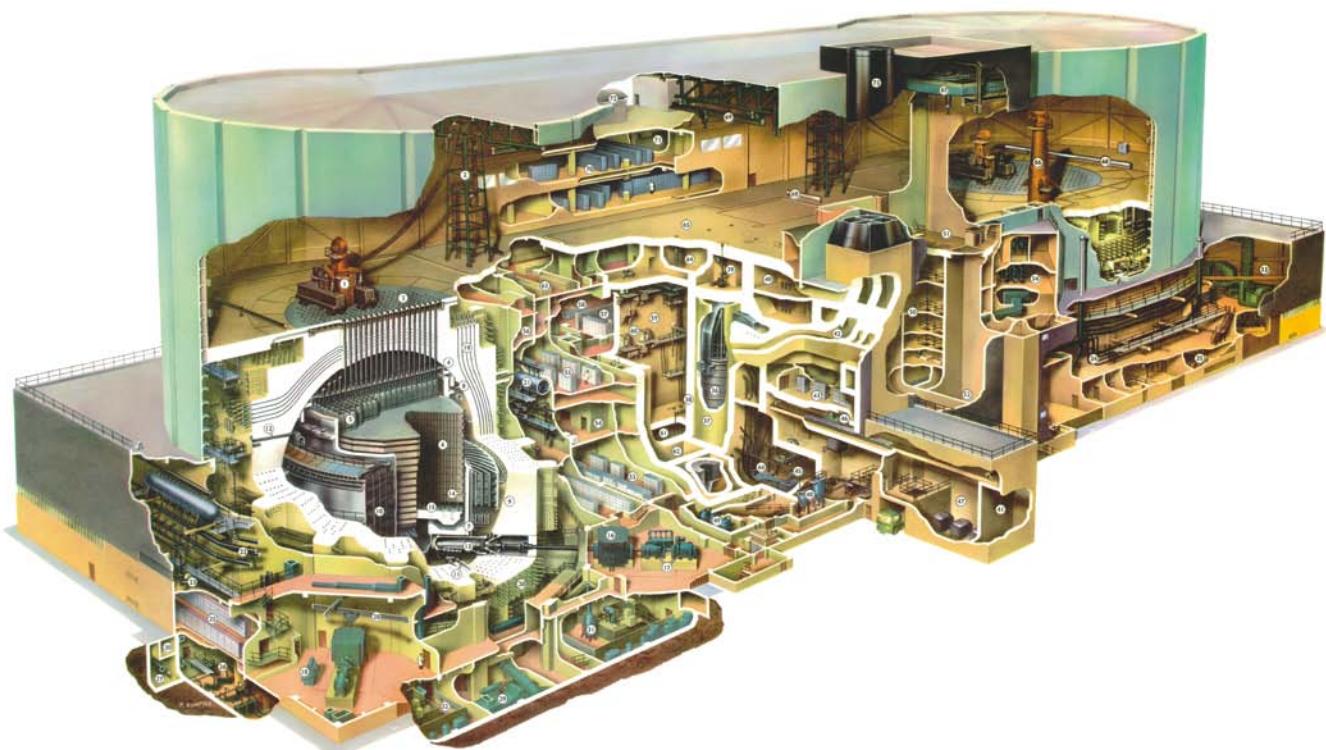


# Cabinet

A QUARTERLY OF ART AND CULTURE  
ISSUE 41 INFRASTRUCTURE





Herbert Wendell Gleason, *The Fitchburg Railroad and Walden Pond in Winter*, 1920. Courtesy Concord Free Public Library.

## THE SINGING OF THE GRID

D. GRAHAM BURNETT

*Here come to study the law of meandering...*

—Henry David Thoreau, *Journals*, 15 October 1851

By convention, at least in the United States, the era of telecommunication opens on the 24th of May, 1844, the day Samuel F. B. Morse transmitted his suitably epochal four-word message—"What hath God wrought?"—from Washington, DC, to Baltimore, Maryland, in a series of staccato taps. That thin copper wire, strung from the old Supreme Court chambers in the Capitol building to the offices of the Baltimore & Ohio Railroad a little further north on the Chesapeake (from the *metropolis* to the *monopolists*), can be thought of as the first strand in what would soon become the network architecture of the modern world. By the early twentieth century, some fifteen million miles of telegraph and telephone cable circled the globe, stretching from the seafloor(s) to the

continental divide(s)—enough to belt the planet a thousand times over.

Though a simple cincture these strands were not. Rather, all this highly conductive copper threaded the earth's surface in an ever-expanding, dendritic radiation from and among the urban nodes of politico-economic power. Here, in this creeping, pole-strung web, lay the indispensable armature of self-consciously modern nations and empires (to be built from *information* and *communication*, not lumpish gold and hacking conquest—or so said the prospectus). Here, visionaries spied the nascent nervous system of a newly evolving, homeostatic, progressive, benevolent organism: *administrative technocracy*, that recurrent dream-state of post-Enlightenment rationality. Here, too, sparked finicky problems of electromagnetism and signal transmission (which would attract the finest minds of the time and precipitate significant scientific developments). And here, finally, and perhaps most alluringly, one could glimpse all the vastness of the



Chromolithograph by George A. Crofutt, after John Gast's 1872 painting *American Progress*. Columbia, the personification of the United States, leads the way by stringing telegraph wire as she sweeps west. Courtesy Library of Congress.

encompassable globe, collectively encapsulated as one titanic, perpetual, spherical, electrical *conversation*—the awesome spectacle of a whole planet *talking to itself*.

Each year, breathless newspapers reported the astonishing number of messages that whizzed along the wires: millions; tens of millions; hundreds of millions. It was a point of pride, the swelling song of ... *ourselves*.

It is thus not quite an exaggeration to say that the worlding of the world happened in wire in the second half of the nineteenth century, engendering, in the process, new problems (of governance, language, war, temporality), new experiences (of voice, distance, intimacy, alienation), and new possibilities (financial, technical, literary, spiritual). Ultimately, all that wire laid the discursive infrastructure of artistic modernism and industrial modernity alike.

God—and the redoubtable, wily Mr. Morse—had wrought *big*.

. . .

In *Walden* (1854), his somewhat crotchety meditation on the nature of things as he saw them, the reclusive sage of Concord, Henry David Thoreau, professed a grumpy and deflationary distaste for the telegraph craze: “We are in great haste to construct a magnetic telegraph from Maine to Texas,” he noted, before adding acidly, “but Maine and Texas, it may be, have nothing important to communicate.”

No enthusiast he, apparently, for the accoutrements of an interconnected futurity. And, indeed, from this bosky book, full of huckleberries and woodchucks, one would likely form a very mistaken impression of Thoreau’s true relationship to that wire net enmeshing the globe as he grew old. For a sense of this, one must turn to the intimacies of his *Journal*, the sprawling private daybooks of an intricate inner life.

There one finds, in the entry for 12 September 1851, the following report of a solitary walk along the railroad line near Three Friends’ Hill in rural Massachusetts:

*At the entrance to the Deep Cut, I heard the telegraph-wire vibrating like an aeolian harp. It reminded me suddenly ... of what finer and deeper stirrings I was susceptible, which grandly set all argument and dispute aside, a triumphant though transient exhibition of the truth.*

And then, just below, as if in incantation, a second telling of this epiphanic communiqué:

*As I was entering the Deep Cut, the wind, which was conveying a message to me from heaven, dropped it on*

*the wire of the telegraph which it vibrated as it passed. I instantly sat down on a stone at the foot of the telegraph-pole, and attended to the communication.*

This techno-acoustic annunciation is just the first of a dozen such invocations of what Thoreau would take to calling the “telegraph harp”—a mysterious, magnificent, and ever-(in)articulate murmur of that new, live wire tuned tight in his deep wood.<sup>1</sup> On the watershed of the 1850s, this unpredictable and accidental music became, for the wanderer of Concord, a solace, a call, a derangement of the senses. A metaphor, to be sure, but also something more. Something strange. He called it, variously, “immortal,” “pathetic,” “divine,” and “mad,” and, in a moment of either colorful hyperbole or terrifying candor, he confessed to his notebook that “the telegraph harp has spoken to me more distinctly and effectually than any man ever did.”

But what did it say? One could wonder. Here he is, for instance, in January 1853, scribbling of yet another exhilarating encounter with the whisper of the wind in the electric lines:

*The telegraph harp again. Always the same unrememberable revelation it is to me. ... It stings my ear with everlasting truth. It allies Concord to Athens, and both to Elysium. It always intoxicates me, makes me sane, reverses my view of things. I am pledged to it. I get down the railroad till I hear that which makes all the world a lie.*

It is a striking litany of paradoxes and inversions. Consider: does this breeze-tune—the sough of ancient zephyrs on that most modern and Olympian lyre—make the solitary pilgrim *drunk or sober*? Unclear. Apparently both. In fact, we would seem to have come upon the swelling chords that sound at the very convergence of madness and sanity.

Little wonder, then, that remembering and forgetting should come unscrewed at such a concert: although the song—melting, he calls it “ambrosial”—apparently reminds him of something supernally important (“stings my ear,” “revelation,” “truth”), this invaluable life lesson, whatever it may be, remains “always...unrememberable.” What a pity!

Although, on second thought, perhaps not: Maybe it’s all to the good to leave this ambiguous epiphany behind, since we seem to be listening to a music that gives the lie to everything, that inverts the cosmos, that turns the listener inside out. Better to forget such a cataleptic melody, no?

That's not what Thoreau seems to have thought. A little further on in his diary he wrote very clearly, "This wire is my redeemer." And it may have been so. But given this shivering thrall to ecstatic transvaluation, given this paean to a musical apotheosis of Apollonian rationality and Dionysian obliteration, one is inclined to say that he is, with the telegraph harp, a good deal closer to redemption by Nietzsche of Sils-Maria than the more familiar thing offered by Jesus of Nazareth.

At any rate, the whole issue would seem to be rather larger than whether Texas and Maine should have an exchange of views.

...

A little background. First, on the general matter of an "Aeolian harp": The idea of a string being plucked by the wind—the notion that natural air movements could sound a lyre—has ancient roots. Thoreau surely knew as much, and it is presumably for this reason that on numerous occasions he finds himself cast into an Attic mood as he listens to the hum of the Concord line ("When I hear the telegraph harp, I think I must read the Greek poets..."; elsewhere, "I never hear it without thinking of Greece..."; elsewhere, "how much the ancients would have made of it!"). But, where the Aeolian harp is concerned, Thoreau's references to antiquity come filtered through more proximate sources as well. And that's because these devices had a modern history, now mostly forgotten.<sup>2</sup>

It was the seventeenth-century Jesuit polymath Athanasius Kircher who resurrected/confected the passive wind harp as a practical instrument. By stringing lines just so, and attaching them to an adequate sounding box or board, one could—the breezes cooperating—generate a weird music. Possibly magical. Maybe the "music of the spheres" itself. Even if not, the thing remained an excellent doodad to present to a potentate as a mystical-mysterious window wind chime with which he or she might wow some regal pals.

And so it went. By the eighteenth century, the Romantics could prop such sonorous contraptions in their blowsy casements and swoon at the queer overtones and minor-key moans of these ghostly, automatic harps. Schiller went on about them. Coleridge wrote a whole poem on the subject. All of which is to say, Thoreau did not conjure the spiritual tremble of the air harp out of, as it were, thin air. His frenemy Emerson loved the things, and may have had one in his own window for a while.

So the wind harp was a known quantity in the mid-nineteenth century, resonant with Hermes'



Herbert Wendell Gleason, *Freight Train from Walden Pond—Edge of Ice, Melting*, 1920. Courtesy Concord Free Public Library.

discovery of the lyre (he supposedly heard some strings singing in the wind) and the prophetic moan of David's harp, hung before his tent at night. There was, in all this, for a well-read New Englander, the tremble of nature's own voice, a numinous vibration that could sound in a key now gothic, now transcendental.

But nothing in this tradition of spine-tingling encounters with the music of the breeze can quite explain—much less explain away—Thoreau's ejaculations in the Deep Cut. The distinctive power and significance of the telegraph harp lay in the *telegraph*, since here the old tunes were playing on a very new instrument. In some ways, the newest instrument of all. And it was this train wreck of past and future, myth and science—a folding of time and meaning, a sideways speech from the torrent of voices flowing down the line—that sent the anchorite of Walden into paroxysms of Anacreonic delight. The harbinger of modernity was speaking in an ancient voice, whispering out of the corner of its mouth.

It's in this conviction that Thoreau hit the clotted classicism and Romantic escapism of previous Aeolian ditties with a mind-bending whammy bar: it was *not* that

the railroad and the telegraph were terrible juggernauts, crushing the ancient gods and silencing the delicate breeze whispering through untrammeled reeds. On the contrary. *Modernity only made sense as mythopoiesis:*

*To have a harp on so great a scale, girdling the very earth, and played on by the winds of every latitude and longitude, and that harp were, as it were, the manifest blessing of heaven on a work of man's! ... And that the invention thus divinely honored and distinguished—on which the Muse has condescended to smile—is this magic medium of communication for mankind!*

And, coming at it the other way, the timeless myths were, in Thoreau's Vedic-Hegelian view, achieving, finally, a kind of self-knowledge in the unprecedented technological innovation of his day. Temporalities reversed course, inosculated. The modern was the ancient, and the ancient was made new:

*To read that the ancients stretched a wire round the earth, attaching it to the trees of the forest, by which they sent messages by one named Electricity, father of Lightning and Magnetism, swifter far than Mercury, the stern commands of war and news of peace, and that the winds caused this wire to vibrate so that it emitted a harp-like and aeolian music in all the lands through which it passed, as if to express the satisfaction of the gods in this invention. Yet this is fact, and we have yet attributed the invention to no god.*

...

OK, fine. "We've never been modern," as Bruno Latour likes to remind us. Thoreau was there. Science and technology were, like the gods of Olympus, simultaneously modes of enchantment and practical solutions to the problems of life. Interesting. But what was the telegraph harp actually *saying*? What did Thoreau think he heard in the Deep Cut?

The answer, I think, is oblique. And it is *obliquity*. The secret whisper of the telegraph harp announced that the *high purpose of all things lay in their creative misuse*. The singing of the grid intoned that art, truth, and beauty were alike an interstitial affair, the fruit of transgressive wandering, experiences snatched only by interlopers, who heard what happened *in-between*.

So, for instance, let's return to that first episode in the *Journals*. It finishes as follows:

*It is no small gain to have this wire stretched through Concord, though there may be no office here. Thus I*

*make my own use of the telegraph, like the sparrows, which I perceive use it extensively for a perch.*

"*Thus I make my own use of the telegraph.*" And this is by no means its intended use. On the contrary, it is a use reserved, of necessity, to those who do not go to the end of the line, those who do not reside at a node in the network of the modern world. Those who do not go to the office. The truth is for those who are *indifferent to ends*. This earth-encompassing web, which embodied on a global scale the ubiquitous urge to get from point A to point B, was at the same time—perfect irony!—a cosmic harp upon which random winds played an endless, subversive symphony: *Hymn in the Key of Anti-Teleology* (Opus 1). As he put it elsewhere in his diary, "Mr. Morse did not invent this music."

Indeed. Rather, this was the special ode of what Thoreau called, one cold day in January 1852, "the tenth Muse":

*It intoxicates me. Orpheus is still alive. All poetry and mythology revive. The spirits of all bards sweep the strings. I hear the clearest silver, lyre-like tones, Tyrtaean tones. I think of Meander and the rest. It is the most glorious music I ever heard. All those bards revive and flourish again in that five minutes in the Deep Cut. ... The very fine clear tones seemed to come from the very core and pith of the telegraph-pole. I know not but it is my own chords that tremble so divinely. ... Thus, as ever, the finest uses of things are the accidental. [emphasis added]*

The true epiphany of the telegraph harp: *only the accidents could save us*. Real redemption lay in a perpetual *détournement*—of time, of technology, of the self itself. This was the orphic oracle of Thoreau's electro-Aeolian redeemer.

...

When I first came upon these passages from the *Journals*, my dominant feeling was shame. How had I managed, across thirty-odd years, to overlook entirely these magic vibrations in the canopy of wires under which I had lived and moved? What an indictment of my phlegmatic sensorium! Had we all become deaf? So I went looking, thinking to redeem myself.

But the truth is, I could find nothing of this Thoreauvian music. Yes, a high-voltage power line will sometimes, particularly when it is humid, emit a disconcerting buzz (either from corona effects or electrostriction), but this has nothing to do with the wind.

And yes, if one really puts one's ear right up against a wooden telephone pole when there is a stiff breeze, it is possible to pick up a sort of low vibration. But this hardly seemed like the symphonic strains of the telegraph harp—which anyway Thoreau clearly claimed to hear at a distance. Something was amiss. Had Thoreau hallucinated the whole thing? Had my senses been functionally dulled by the cacophony of urban life?

New project. I set out to see if I could learn why the grid no longer seemed to sing as it once did. This little quest took me to a set of improbable books and articles (e.g., Kiessling et al., *Overhead Power Lines: Planning, Design, and Construction*; Rowbottom and Richards, "Mechanical and Aerodynamical Problems Associated with Future Overhead Lines," etc.), and found me plugging some figures into the equation for something called the "Strouhal number" ( $St=fD/V$ ), a constant that enables you to work out the frequency of "vortex shedding" in a fluid dynamic system given the speed of the flow and the size of the obstacle. I also spent some time on the phone with some old line engineers, who were very happy to oblige.

The upshot goes something like this: Aeolian vibrations are caused by little whirlpools that form on the leeward side of a cylinder (in this case the round wire) when it stands against a stream of air or water. These whirlpools, now here, now there, forever sucked downstream, set up an oscillation in the cord. Under certain conditions, such a vibration can actually be "captured" (and effectively reinforced) by a harmonic frequency. If any of this is happening in the audible range, it's music—it's the telegraph harp in good earnest.

But it turns out that the audible range favors very small wires. On the order of an eighth or a tenth of an inch in diameter. This was indeed the diameter of the single-strand, "open wire" telegraph lines of old, but it is much finer than the composite cables of later telephony and power transmission.

On top of that, there was the small matter of damping. All this vibration—pleasing as it may be to the ears of transgressive transcendentalists—can be very hard on the wires themselves. By the early twentieth century "wind-induced conductor motion" (vibration, "galloping," "wake-induced oscillation," etc.) was the leading cause of network failure in the United States. The lines weakened, broke, and fell. Often. Everywhere.

It was about this time that a Massachusetts-born electrical engineer named George H. Stockbridge—a rangy fellow who had grown up not far from Concord, and then gone west to work as a lineman for Southern California Edison—developed what would come to be

known as the "Stockbridge Damper," the device still used around the world to stop suspended wires from vibrating.<sup>3</sup> It looks a little like a small barbell, and you've seen them a million times without noticing—suspended under the telephone and power lines that still web the globe. Stockbridge sold the patent to Alcoa, and did very nicely by it. As did they.

But the grid is now, for all intents and purposes, silent.

<sup>1</sup> This is the first reference in the *Journals*, but Thoreau did write of the phenomenon two years earlier in his self-published *A Week on the Concord and Merrimack Rivers* (Boston: James Munroe and Co., 1849). There are a number of thoughtful and elegant essays on Thoreau's fascination with the Aeolian effects and the new telegraph lines. For a classic reading (and full citations for many of the *Journal* references), see Paul Sherman, "The Wise Silence: Sound as the Agency of Correspondence in Thoreau," *The New England Quarterly*, vol. 22, no. 4 (December 1949), pp. 511–527. For a more recent take, informed by current work in acoustic history (and an interest in John Cage), consider: Jannika Bock, "'There is Music in Every Sound': Thoreau's Modernist Understanding of Music," *COPAS* no. 7 (2006), available at <[www-copas.uni-regensburg.de/articles/issue\\_7/Jannika\\_Bock.php](http://www-copas.uni-regensburg.de/articles/issue_7/Jannika_Bock.php)> (accessed 10 April 2011). Also worth a look: John Hollander, "The West Wind and the Mingled Measure," *Daedalus*, vol. 111, no. 3 (Summer 1982), pp. 131–148.

<sup>2</sup> There is a great deal of historical and practical information on these devices in the series assembled by Stephen Bonner (and others), *The Aeolian Harp* (Cambridge: Bois de Boulogne, 1968–1974), four volumes in five books, with supplements. See also the superb chapter 5, "The Aeolian Harp and the Romantic Quest of Nature," in Thomas L. Hankin and Robert J. Silverman, *Instruments and the Imagination* (Princeton: Princeton University Press, 1995).

<sup>3</sup> The original paper is: G. H. Stockbridge, "Overcoming Vibration in Transmission Cables," *Electrical World*, vol. 86, no. 26 (December 1925), pp. 1304–1305. My thanks to Charles B. Rawlins for sharing his copy with me, and for his technical thoughts on Aeolian phenomena in the nineteenth century.