Edison's Ghost

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Thomas Edison's ghost haunts us all. As much as Beethoven's, Edison's hearing loss forms an indispensable condition for the attempt to understand both the person and the particular histories of sound and listening in which he was involved. Consider the irony of the inventor of the phonograph leaving tooth-marks in the wood of the grand piano in his parlor and his personal phonograph, biting them in order to hear through his teeth and jaw (Picker 2001). Marianne Boruch (2005) compares Edison's solitude, his relationship to interiority and voice, to a poet's. "If poetry is our literary form of solitude," she writes, "our way back to that most private of rooms, then its deepest architecture ... depends on line ... Enter Edison once more, bent close to his telegraph, screening out the world's cacophony to focus line by line" (2005:4-5). The layered figures of Edison—the inventor, the social critic, the futurist—refract shifting notions and new mediations of voice, language, hearing, and listening in the modern world Edison was helping build the scaffolding for. The limits of hearing framed the modernity Edison helped to usher in.

Edison considered his deafness not a handicap, but a harbinger of the condition of humanity living in the context of urban industrial modernity. Murray Schaffer's romantic neo-medievalism imagined the city as a descent into an arena of loss, in which soundscapes were, to use Schaffer's well-worn complaint, "lo-fi" environments in distinction to the "hi-fi" soundscapes of the pre-industrial world of nature, rurality, and village (1993[1977]:43). Schaffer's language here, like his difficulties with the consequences of "schizophonia" (1969:43), is impossible without Edison's prior involvement in questions of sound recording, reproduction and fidelity. But Edison did not seek relief from modernity's urban spaces in Schaffer's village and town. For his part, Edison figured the modern industrial city as a space in which not only new kinds of listening, but a new kind of human being, would emerge through adaptation to a new kind of environment.

In a 1926 interview appearing in Henry Goddard Leach's *Forum* magazine, Edison expressed his views about "The Scientific City of the Future."¹ Describing a number of areas in which he thought scientists, mathematicians, and inventors would make cities more convenient and efficient, Edison turned to the subject of urban sound. Noise would continue to increase as cities and their traffic congestion grew, Edison told journalist Edward Marshall. Busses running on tires rather than streetcars on rails would help. "But noise probably will not decrease to any great extent." Edison did not fear this development. "I don't think it hurts us," he said. "It decreases the acuteness of our hearing, but in cities we do not need hearing as acute as that which the savage must have in the forest where every dropping branch and crackling twig may be significant. So I am not worried about the clamor of the city of the future." Urban civilization changed the nature of information, and made hearing less important for understanding the significance of events than it was in pre-modern, pre-urban communities.²

¹ The article was the third of four interview pieces. In the first Edison discussed his views of the role of machinery in freeing rather than enslaving the modern worker. The second concerned his views on man's immortal soul. In the fourth article Edison discussed the youth of the day and their potential.

² A number of rainforest ethnographies of the 1980s concurred, if a bit obliquely, with this assessment of the role of hearing

For Edison this was a matter of adaptation and natural selection. Noise would not affect the city dweller's nerves any more than the babbling brook did the forest dweller. "I am deaf, having been so since my boyhood," he said. "I am deafer now than I used to be. The noise of a city doesn't trouble me at all. On Broadway I can be as undisturbed as the average man can be in the deepest recesses of the most silent forest." Edison concluded that his deafness thus "has been and is an advantage to me. It saves me from many interruptions and much nerve strain."

Edison argued that his audiometric circumstance, far from being a singular story, blazed a path for the modern human condition. "I am only a few laps ahead of the average city man in being deaf," Edison told Marshall. "Becoming accustomed to noise," he continued, "is, in reality, becoming deaf. It really will not matter to the city dweller of the future whether he lives in the noisiest or the most silent part of the city. He will be sufficiently deafened by Nature so that the noisiest places will not be disagreeable to him. Nature," Edison concluded, "has always done such things for all its creatures. This is what is called 'adaptation to environment.'"

Edison's attraction to silence lived side-by-side with his interest in music. He once hired Isa Maud Ilsen, a founding voice in the practice of music therapy, to present lectures to the Edison Company on the psychology of music (Anonymous 1918).³ But as much as his nerves were quieted by the enforced silence of his modern deafness, they were jangled by the detectable sounds that accompanied the production of musical tones. The extraneous noises of instruments—as he explained to Paul J. Morris in *The Musician* for May of 1916—"a guttural sound in the throat of a singer, the harsh scraping of a violinist's bow improperly used, or the hard metallic sound of the thumping of the hammers of a piano" in the upper register—these sounds disturbed Edison greatly. Edison inquired whether Morris realized that the clacking of accordion keys "makes a noise almost as loud as the music which that instrument produces?" The situation did not please Edison at all. "The mechanical side of music is not what it ought to be," he concluded. "There is too much noise and too little music." He considered these noises "foreign to the music itself," and intended to apply his inventive genius to find a solution.

For Edison, the sonic object that was music lay behind the distracting noises interfering with its transmission.⁴ Listening to music was a process of listening *through* (Hainge 2007; Kromhaut 2014; Daughtry 2015). Acknowledging the history of the extraneous noise that attended the mechanical cutting of a groove into wax, metal, or vinyl, still Edison's plan for eliminating unwanted sounds in musical *performance* was to have musicians make and listen to phonograph recordings. "You can tell a player that he is making false tones or noises that are not part of the music and he may or may not believe you. But if he

in the modern sensorium. See Feld (2012[1982]), Seeger (1987), and Roseman (1991)—although Edison's assessment of the safety of not hearing someone sneaking up behind you on Broadway might fruitfully be read, perhaps, through the glass of Giddens's (1990) classic discussion of risk and trust as part of the stakes of modernity.

³ Ilsen's association with music's healing powers on the one hand and Edison phonography on the other highlights the separation of production and consumption, practices of performing and listening, that marked the social shifts attending the popularity of the Edison machine. A 1908 *Music Trade Review* advertisement for the National Phonograph Company, for example, imagines the phonograph customer in an instrument shop as not being "a customer for anything else." Shopkeepers wouldn't be able to sell them a "banjo, harp or piano." Indeed, "He has no musical talent and never will have." Yet this talentless customer "cares for music and he knows that he can have the music of every instrument in your store and songs as well, by purchasing a Phonograph." Ilsen, too, seemed to imagine music therapy as a practice of the patient rather than the agent—of being sung to—but her history of music as a medical practice acknowledged the "corridor singing" instituted by Florence Nightingale (Ilsen 1925). See advertisement at <http://mtr.arcade-museum.com/MTR-1908-47-5/MTR-1908-47-5-35.pdf>.

⁴ Edison did give the poetic name "molecular music" to the detectably audible results of the expansion of telephone handsets as a result of being exposed to the heat of the user's hand. The observation led to his invention of the microtasimeter (Fox 1879).

makes a record of his playing all of the blemishes are recorded along with the pure music. He can hear them for himself and will thereafter make an effort to eliminate them.”

As with the telephone, experiments with recording emerged out of a desire for a more reliable and confirmable telegraphy. In an oft-repeated story Edison, in a journal note of July 18, 1877, observed of an experiment with a telegraph repeater that “there is no doubt that I shall be able to store up and reproduce automatically at any future time the human voice perfectly” (Kolodin 1977:20). That perfection faced challenges from two inherent sources of noisiness: the noise within the mechanical processes of recording and reproduction, and the noise within the original performance being recorded. The first fell under a consideration of the matter in and through which sound was captured and stored. Valdemar Poulsen’s telegraphone, or wire-recorder, used a variable magnetic charge on a metal surface rather than a vibrating stylus inscription to store acoustical information, and was for that reason considered superior to the inscribed cylinder or shellac disc:

The Telegraphone, being an electromagnetic instrument, records the human voice upon imperishable steel through the intangible but potent force of electromagnetism. No foreign or mechanical noise is heard or is possible, because none is made or received. Whatever natural sounds are received are faithfully given back. The prattle of a child, the heart-breaking sob, the sonorous sermon, the tragedy, pathos, or humor of the actor, the soul of the singer, the faintest sigh, the peculiarly *pleading* quality of stringed instruments—these sounds are all duplicated, and nothing but these sounds *is* duplicated. There is quality, tone, color, and individuality in the *Telegraphone* voice simply because each or all are in the human voice. (Anonymous 1907:220, emphasis in original)

The rhetorical trope of *perfection* surfaces in a section of William J. Hammer’s Smithsonian report on the telegraphone reprinted in the article cited above. “Altho Mr. Edison has recently made remarkable improvements in the *perfection* of recording and reproducing by means of his phonograph over his earlier forms,” wrote Hammer, there were insurmountable difficulties in the mechanical process by which “a stylus is always employed to cut the surface of the wax, metal, or other yielding substance.” In testing the telegraphone, however, Hammer found that he could successfully record and play back even “certain words which those who have had experience in working with a phonograph know have always been very difficult to record and reproduce *perfectly*.” These words, as well as “the most delicate sounds, even breathing and very low whispering ... All have been taken care of most *perfectly* in the Telegraphone” (in Anonymous 1907:220, emphasis added).

Edison and his company worked hard at the task of smoothing out the shortcomings of the recording and reproducing process. Some of these included making the surface speed of the groove passing under the needle as uniform as possible, experimenting with different materials and shapes for needles and stylus tips, different materials for reproducing diaphragms and resonators, different means of stabilizing the position of the stylus as it sat in the groove, and finding more durable materials for the manufacture of cylinders. In 1912, when the Edison Company finally acquiesced to the greater popularity of the disc format of the Victor machines, the Edison Diamond Disc “achieved the highest standard of any acoustical disc” (Kolodin 1977:21).

Much of the effort in “perfecting” the mechanical reproduction of sound was expended in the attempt to eliminate inconsistencies or to standardize the means by which a sound was committed to or extracted from a storage medium. But if Edison considered his deafness to augur a form of urban human sociability for the future, he held out only a dim hope that musicians would be able to overcome the

superfluous squeaks and clacks and grunts that accompanied their performance of music. Edison's diminished hearing engaged him in a debate about the senses. "My deafness has aided me in my work," he told Paul Morris, "not only because it has the effect of giving discordant sounds an exaggerated prominence in my ears, but also because it has taught me not to rely on my own hearing for judgment. Consequently," he concluded, "I have made recording instruments more delicate than human ears, showing beyond question whether a singer sings in tune, whether a voice has a tremolo, or whether any false notes or sounds are present."⁵

Irving Kolodin's 1977 centenary retrospective questioned Edison's musical knowledge and sophistication—and laid the blame at the feet of Edison's deafness. "At thirty," Kolodin wrote, "Edison was already hard-of hearing and lacking in most aural indications of what we call 'culture': his vision of the 'child's' [i.e. the phonograph's] musical future was limited to the reproduction of simple tunes and familiar melodies that the Edison family loved" (1977:20).⁶ Be that as it may, Edison's deafness also sent him on in quest of perfection in musical execution. As with the machinery of recording and replication, perfection manifested itself in the image of a glassy, blemishless surface, uniform and consistent. And the solutions he proposed for musicians shared aspects with the solutions he proposed for phonographs.

Chief among Edison's criticisms of singers was tremolo. He called it "the bane of most music lovers" (Anonymous 1916). Almost but not quite as important to Edison was the inability to sing in tune. "Surely not one in a dozen professional singers can sing a simple scale with anything approaching true intonation, and my records show no better percentage," he told Morris. Here Edison made a distinction between artistry and technique. "Many of the most famous of opera singers sing badly," he said. "They may interpret well, but that is a different matter. Only a few artists, like Caruso and Emmy Destinn, combine interpretive ability with faultless voice production." In preferring Destinn, Edison revealed an inclination toward precise intonation with a minimum of vocal flourish between notes.⁷ "The most perfect voice which as yet I have found," Edison said, "is that of a young man named Donald Chalmers. You probably have never heard of him, since he is neither an opera singer nor a great interpreter of song. Yet my records show an almost perfect vocal organ." Chalmers recorded for Edison's label, so we can not dismiss the possibility that there is a bit of puffery in the assessment. But Chalmers, too, exhibited precise intonation and a spare expressive arsenal in his song interpretations. The "perfection" of Chalmers voice lay in its lack of variance from its target tones.⁸

Instrumental performers, too, came under Edison's scrutiny. He objected to the "inefficiency of orchestra players," the descriptive noun denoting something akin to the imprecision of vocal intonation. He appears, as well, to have objected to the distinctive acoustical signatures that mark the establishment of a standing wave in different resonating chambers (Taylor 2000). His concerns with the inefficiencies of playing are all concentrated on the "beginnings" of notes, as the performer establishes the pitch. Edison claimed that his study of the Boston Symphony violin section revealed that "[s]carcely a man started his

⁵ For more recent versions of this debate, see e.g. Perlman 2004.

⁶ Kolodin here was distinguishing between the phonograph's musical future and its future, as he argues Edison envisioned it, as "content with taking dictation, reproducing books for the blind, and teaching elocution" (Kolodin 1977:20).

⁷ For a recording of Emmy Destinn performing "Vissi D'art" from Puccini's *Tosca* go to

<https://www.youtube.com/watch?v=hSLVcTqz8cA>

⁸ Edison was also sharply comparative and critical of "national" styles of singing. Italians and Americans had the best natural singing voices, Edison reported. "Russian voices are very bad," he said, "and if some people think badly of the Germans on account of the war I wonder what they would think if they could hear how bad most of German records are. Germans are not fitted for singing. They make guttural sounds and their notes all begin wrong" (Anonymous 1916). For a recording of Donald Chalmers performing "The Sea Makes a Man a Man," go to <https://www.youtube.com/watch?v=ThTX7PtImec>.

notes correctly.”

The culprit, Edison argued, was the composer. “No violinist living can skip from a low to a high note and do it perfectly,” he argued.

It is beyond the power of human fingers to move rapidly a distance of, say, three inches up the finger board without anything to guide them and not miss the mark by one thousandth of an inch, which is a perceptible interval to delicate ears. Such skips are usual in violin music, and in making them violinists produce a false tone at first. Their ears tell them instantly whether to move their fingers slightly up or down for the correct pitch. It all happens so quickly that the average ear does not catch the false beginning, but it is very clearly shown by my recording device. (Anonymous 1916)

Edison's solution was to devise a mechanical device to perform the left-hand fingering action, “which is the mechanical part of violin playing,” thus leaving the performer to only worry about the bowing hand, which in Edison's view comprised the expressive part of playing the instrument.

Indeed, Edison admitted, “In my study of music I have purposely neglected the interpretative side. That is for others to discuss. I do not pose as an authority on interpreting music.” It was the mechanics of musical sound production that occupied him. “The mechanical side of music needs many improvements,” he said, “and I intend to make it as perfect as possible before I finish my musical studies.”

It is my intention to make music better mechanically. When I have perfected an electric violin finger board and have found a method for eliminating the useless noise in pianos made when the hammers strike the strings of the highest octave and a half, I will try to improve other instruments. Clarinets and brasses are far from perfect. But it is not alone instrumentalists who are in need of help. The mechanics of voice production is even worse in general. (Anonymous 1916)

Edison's work on the production and recording of music bear a greater resemblance to Mark Katz's accounting of the effect of recording on performance (2004), Thomas Porcello's (1996) discussion of the layers of hidden mediation involved in the presentation of a contemporary “live” performances, and Steve Wurtzler's work on the interleaving of live and mediated sound performance (2007), than they do to Philip Auslander's discussion of “liveness” as something that can be extracted from mediatized performance or even Wurtzler's earlier (1994) work dividing performances into maximally “live” and maximally “recorded” events. That is to say: performance practice changed under precisely the kind of listening feedback Edison proposed, such that what we think of as live performance today already bears the indelible stamp of the culture and ideology of recording and mechanical perfectibility championed by Edison. As Charles Wuorinen lauded, “standards of accuracy have risen under the pressure of recording practices. When a performance can be called back from the ether time and again, tolerance [for inaccuracies] diminishes almost to zero” (1977:24). But, Wuorinen also lamented, “recorded sound has come with frightening regularity to replace live sound as a standard for acoustical excellence” (ibid). Wuorinen was here referring to the design of contemporary concert halls, architecturally analogous more to projecting loudspeakers than to acoustically resonant rooms.

Edison framed his deafness as a key to a sound future for the urban industrial human being. The elimination of extraneous, unwanted noise made life and work more efficient. It also made him more aware of the extraneous noise that accompanied musical sound, as that sound itself had a decreasing effect on his tympanic membranes. If his hearing loss made him particularly sensitive to the noisy inefficiencies of musical performance, the solution he found was the veritable nail to his hammer. Making music-

making a more efficient endeavor would free musicians to focus on the interpretive aspects of their art. That Edison saw this freedom as arising from a judicious use of electricity and machinery means that, in the end, his ideas were entangled in an ethical debate about what sounding human means in the modern, urban, industrial world—a debate that any engineer who has used the pull-down menus in Logic Pro to “humanize” the timings and velocities of a quantized midi drum track understands. In opposition to socialists influenced by William Morris or Catholic traditionalists like Eric Gill, Edison saw machines as freeing rather than enslaving humankind. Gill, for example, held industrial machinery responsible for the ideological separation of “worker” and “artist.” The modern world had sundered use and exchange to the detriment of both. On one side was “the factory hand,” whose life was to make useful things without art. On the other was “the man whom we call artist,” dedicated to making useless but beautiful things (Gill 1936:319). By Gill’s reckoning, “[m]achines do not exist to make things better, but simply to make them in larger quantities, more quickly, and at less cost in human labour” (Gill 1936:317).

In the first of the four interviews with Edward Marshall appearing in the *Forum*, Edison disagreed strongly with Gill. In opposition to Gill’s idea that hand-work embedded the soul and personality of the hand-worker, Edison argued rather that “[t]he hand worker’s product is uneven.” Machines, in that sense, could overcome “the ill-effects of man’s changing physical and mental conditions.”⁹ Machines, and their ability to create products that were “uniform and universally dependable,” would free mankind into an explosion of intellectual and mental development. “If labor everywhere would strike against the use of men as animals instead of protesting against their use as human beings,” Edison concluded, “it would show superior wisdom.” That we are able to hold these opposing views of what constitutes the musically human in tandem with each other is, perhaps, one of the defining features of our current sonic moment.

I plug my bass guitar into the hardware link that connects it to my tablet and allows me to access any one of the four digital emulating applications I’ve downloaded. Edison’s ghost haunts the direct current that flows through the circuit. The first stomp-box on the screen—almost the default digital effect, first in line with every configuration—is a noise gate filter. It eliminates the squeaks and scratches of fingers on strings. This is the Edisonian effect idealized, allowing the pure music to be heard without all that clacking of keys and fingers. Crazy to keep calling it a stomp-box—I’m never going to stomp on my iPad. I wrap on my headphones, adjust the volume, and begin to warm up. Sounds good, but is it me, or is it the signal processing? Shall I choose one of the dozen other amplifiers in the package? I’m no longer simply listening to myself play the instrument. I only hear through the circuitry. I tap on the screen and boost the virtual Ampeg’s high midrange. Is it because I like the sound, or am I simply compensating for the hearing loss I’ve inherited from my father, a gentle downhill slope beginning at around 4 kHz? I have hearing aids coming. They will be Bluetooth capable, and I will be able to adjust the acoustic fingerprint of any environment I enter through an app in my smartphone. It’s weird—as if someone gave me artificial eyes and said, “And if you want to make the world look really red you can adjust this knob here.” All I want is to hear things as they are—to hear the way I remember hearing. I begin with some arpeggios up and down the instrument’s neck. The emulating software allows me to record myself practicing. As I listen to the playback, I notice: ooooooh, that was a buzzy note ... didn’t quite make that position shift as cleanly as you thought ... I’m now no longer thinking of myself cradling this crafted piece of wood and electronics in my hands. I’m listening to what I’ve done with it. The mistakes I’ve made with it, really. Thinking, as I listen,

⁹ As I have cited an article by Gill that appeared a decade after the one I cite by Edison, I want to note that in his discussion of machinery, Edison made specific note of “Englishmen”—Gill was born in West Sussex in the south of England—“whose workers never have ceased agitating against machinery” (1926b:495).

of all the ways I can improve my human interface to eliminate the inaccuracies that the technology unfailingly tells me are there. And Edison's ghost tells me: you can focus on the sound. But you can't trust your ears.

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Abstract

Thomas Edison's futurist thoughts about the twentieth century modernity he helped to invent imagined a central place for hearing in urban spaces. He argued that deafness was simply Darwinian adaptation to modern circumstances. Edison's hearing impairment thus ushered in the urban man of the future. At the same time, he worried about extraneous noise in musical performance and sought ways of controlling or eliminating it. In this essay I explore some of Edison's agenda-delineating statements and their implications for still-current ethical distinctions between biology, physics, and aesthetics, noise and music, and literal and poetic signs.