Machines, Music, and the Quest for Fidelity: Marketing the Edison Phonograph in America, 1877-1925
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Machines, Music, and the Quest for Fidelity: Marketing the Edison Phonograph in America, 1877–1925

Emily Thompson

1. Introduction

On Friday afternoon, 28 April 1916, a crowd of music lovers and curiosity seekers gathered at Carnegie Hall in New York. They came to hear a "tone test," a recital of music and musical "re-creations" sponsored by Thomas A. Edison Incorporated. The event, headlined "Edison Snares Soul of Music," was described the next day in the *New York Tribune:*

> Startlingly novel even in this age of mechanical marvels was the concert that drew 2,500 persons to Carnegie Hall yesterday afternoon.
>
> Alone on the vast stage there stood a mahogany phonograph, apparently exactly like the tamed and domesticated variety that has become to be [sic] as much a part of the furniture of the ordinary drawing room as was the wheezy melodeon a generation ago. In the midst of the hushed silence a white-gloved man emerged from the mysterious region behind the draperies, solemnly placed a record in the gaping mouth of the machine, wound it up and vanished.
>
> Then Mme. Rappold stepped forward, and leaning one arm affectionately on the phonograph began to sing an air from "Tosca." The phonograph also began to sing "Vissi d'Arte, Vissi d'Amore" at the top of its mechanical lungs, with exactly the same accent and intonation, even stopping to take a breath in unison with the prima donna.
>
> Occasionally the singer would stop and the phonograph carried on the air alone. When the mechanical voice ended Mme. Rappold sang. The fascination for the audience lay in guessing whether Mme. Rappold or the phonograph was at work, or whether they were singing together.[1]

Thousands of tone tests, identical in format to the event described by the *Tribune,* were presented to millions of Americans in the years between 1915 and 1925. From Symphony Hall in Boston to the Keyler Grand Theater in Walla Walla, Washington, Edison

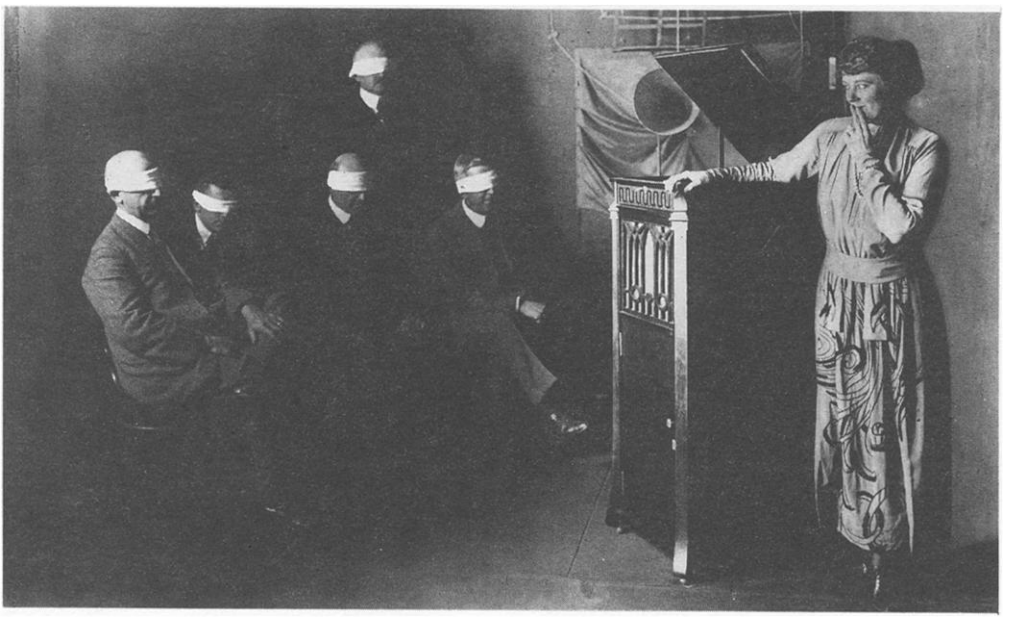


Figure 1. Publicity photograph of Frieda Hempel, Edison recording artist, with Edison employees, circa 1918. Courtesy United States Department of the Interior, National Park Service, Edison National Historic Site

recording artists and Edison re-creations performed in tandem, convincing—or attempting to convince—audiences that "it was actually impossible to distinguish the singer's living voice from its re-creation in the instrument."[2] By equating phonographic recordings with live performances of music, the tone test advertising campaign of the Edison Company helped to transform musical culture in America.

As phonographic technologies provided a means to mass-produce identical recordings of musical performances, people increasingly experienced music not by attending unique live performances or by producing music themselves in their homes but instead by purchasing recordings, carrying them home, and reproducing the music on machines in their parlors, whenever and as often as they desired. Cultural critics as diverse as John Philip Sousa and Theodor Adorno have examined the significance of this transformation.[3] Whether celebrating the widespread diffusion of previously restricted events and experiences or decrying the perceived degradation of those events by that same diffusion, critics have uniformly constructed their analyses in terms of "the impact of the machine" upon musical life.

Most recently, Miles Orvell has more generally posed the question, "How has the machine, with its power to produce replicas and reproductions, altered our culture?"[4] While Orvell does not specifically consider musical culture, his focus on "imitation and authenticity in American culture" renders his analysis particularly applicable to the phonograph, and especially to the tone tests, with their challenge to audiences to distinguish creation from re-creation, authentic from imitation. Orvell considers the cultural forms of literature, photography, and domestic furniture, and he charts a trajectory from a nineteenth-century culture of imitation "fascinated by reproductions of all sorts" to a modern effort "to get beyond mere imitation, beyond the manufacturing of illusions, to the creation of more 'authentic' works that were themselves real things."[5] Modern artists strove not for realism but for "reality itself," and consumers of modern art (in whom Orvell is far less interested) similarly sought not realistic reproductions but "the real thing."[6]

Within an Orvellian framework, tone tests should be seen as retrograde, vestigial celebrations of the mimetic capability of the machine, evidence that, as Orvell himself notes, "the nineteenth-century culture of imitation remained (and still remains) a strong part of the mainstream of twentieth-century industrial popular culture."[7] Indeed, phonographic recording more generally seems to have played a predominantly conservative role with respect to musical creation and composition throughout most of its preelectric life. The phonograph was put to work recording and reproducing music as it existed prior to the development of the new technology; few chose to use that technology to create a new kind of music in the way that Georges Méliès, Sergei Eisenstein, and others employed motion picture technology to render film an art form distinct from traditional theater.[8]

Still, an artist and architect as modern as Hannes Meyer chose to include a phonograph in his self-portrait (1924) as well as in his antibourgeois "Co-op Zimmer" (1926), a photograph of a model bedroom for modern life.[9] And in his 1927 review of *Manhattan Transfer*, D. H. Lawrence drew upon the phonograph to describe the modernity of the prose of John Dos Passos.[10] Phonographic reproductions clearly constitute a kind of modernity that Orvell's account fails to acknowledge. In his effort to address "the machine," Orvell apparently falls short of accurately describing this particular machine. The modernity of the acoustical phonograph lies not in the realm of aesthetic production but in consumption.

T. J. Jackson Lears, like Orvell, has addressed the quest for "reality" and "authentic experience" that occupied people during the

decades surrounding the turn of the century,[11] but unlike Orvell, Lears has recognized the importance of the consumer culture associated with the mass-produced products and reproductions, the "communities of consumption" that Orvell acknowledges[12] but never really explores. Lears's work has indicated how advertising and the commercial culture associated with the marketing of mass-produced objects provided new conceptual and perceptual resources for consumers to draw upon to define the meaning of those products in their lives. While Lears has emphasized the institutionalized power of professional advertising agencies working in concert with large corporations to promulgate a particular cultural image or message, Lizabeth Cohen has explored how various groups of consumers, defined by economic status, race, and ethnicity, have responded differently to that message and have assigned their own distinctive meanings to the mass-produced objects in their lives.[13] Cohen considers consumers who differed in some way from the model consumer depicted and described by advertisers; in contrast, I focus here exclusively on consumers who, at least superficially, fit the image—white, middle class, educated, native born—presented by advertisers. Yet they, too, will be shown to work with the material of advertising campaigns, applying it to their own sets of issues and concerns to create their own definition of "real music."

2. A History of the Edison Phonograph and Phonographic Fidelity

In 1877 Thomas Edison was trying to improve the telegraph. He believed he could increase transmission speed, and thus the information-carrying capacity of a line, by prerecording Morse code messages as indentations on a strip of paper. The paper, when passed under a tracing point, would open and close the telegraph circuit. A rapidly moving strip of paper could then transmit an electronic message much faster than the prevailing method of nonrecorded, manual key tapping. Edison was intrigued by the noise that the apparatus produced, "a musical, rhythmic sound resembling that of human talk heard indistinctly."[14] The noise brought to mind another ongoing project: the amplification of telephonic voice signals. He attached the embossing point to a telephone diaphragm, created an indented-paper record of his voice, described this experiment in his notebook, and concluded, "[T]here is no doubt that I shall be able to store up and reproduce automatically at any future time the human voice perfectly."[15]

One month later Edison submitted a design to his model-builder, John Kreusi. The long, narrow strip had contracted into a continuous spiral around a cylinder, and tin foil now replaced the fragile paper. Kreusi built the machine and Edison gave it its first trial. He set the cylinder in motion, engaged the needle, and recited "Mary had a Little Lamb." With those inauspicious words, the history of phonographic recording began.

Edison's invention was proclaimed the acoustical marvel of the century.[16] The storage and retrieval of sound was an unprecedented achievement, and everyone was amazed that such a simple machine —it looked like a small lathe—could somehow preserve and then reproduce the human voice.[17] As a storage device, the phonograph was initially compared to the camera. Edison claimed that "[f]or the purpose of preserving the sayings, the voices, and the last words of the dying member of the family—as of great men—the phonograph will unquestionably outrank the photograph."[18] Yet no one really knew what purpose the phonograph would ultimately fulfill. Edison suggested everything from spoken letters and recorded telephone conversations to musical toys and talking advertisements.[19] Another proposal was set forth by *Scientific American:* "It is already possible by ingenious optical contrivances to throw stereoscopic photographs of people on screens in full view of an audience. Add the talking phonograph to counterfeit their voices, and it would be difficult to carry the illusion of real presence much further."[20] "The illusion of real presence" represents a standard of performance, and this standard is tied to the nature of the proposal. If the phonograph were to represent an individual, speech would have to be reproduced with "sufficient fidelity to make the voice easily recognizable by those who were familiar with the original."[21] "Fidelity," or faithfulness to the source, was the goal.

How did the phonograph actually sound to those who heard the first demonstrations? An account of Edison's first public demonstration noted that the recording was "perfectly audible" to a dozen or more people, and that the machine pronounced its own name with "especial clearness."[22] There was no illusion of real presence. Still, Edison claimed that "the apparatus is practically perfected in so far as the faithful reproduction of sound is concerned."[23] He based his opinion not on the recognizability of an individual's voice but on the ability of a listener to understand every word. While Edison recognized a loss in "quality," he felt this loss was "nonessential in the practical application of the apparatus."[24] Others, however, were more critical of this loss of quality: "Now, it is quite evident to you that though the production of sound is very wonderful, it is not very perfect. . . . The

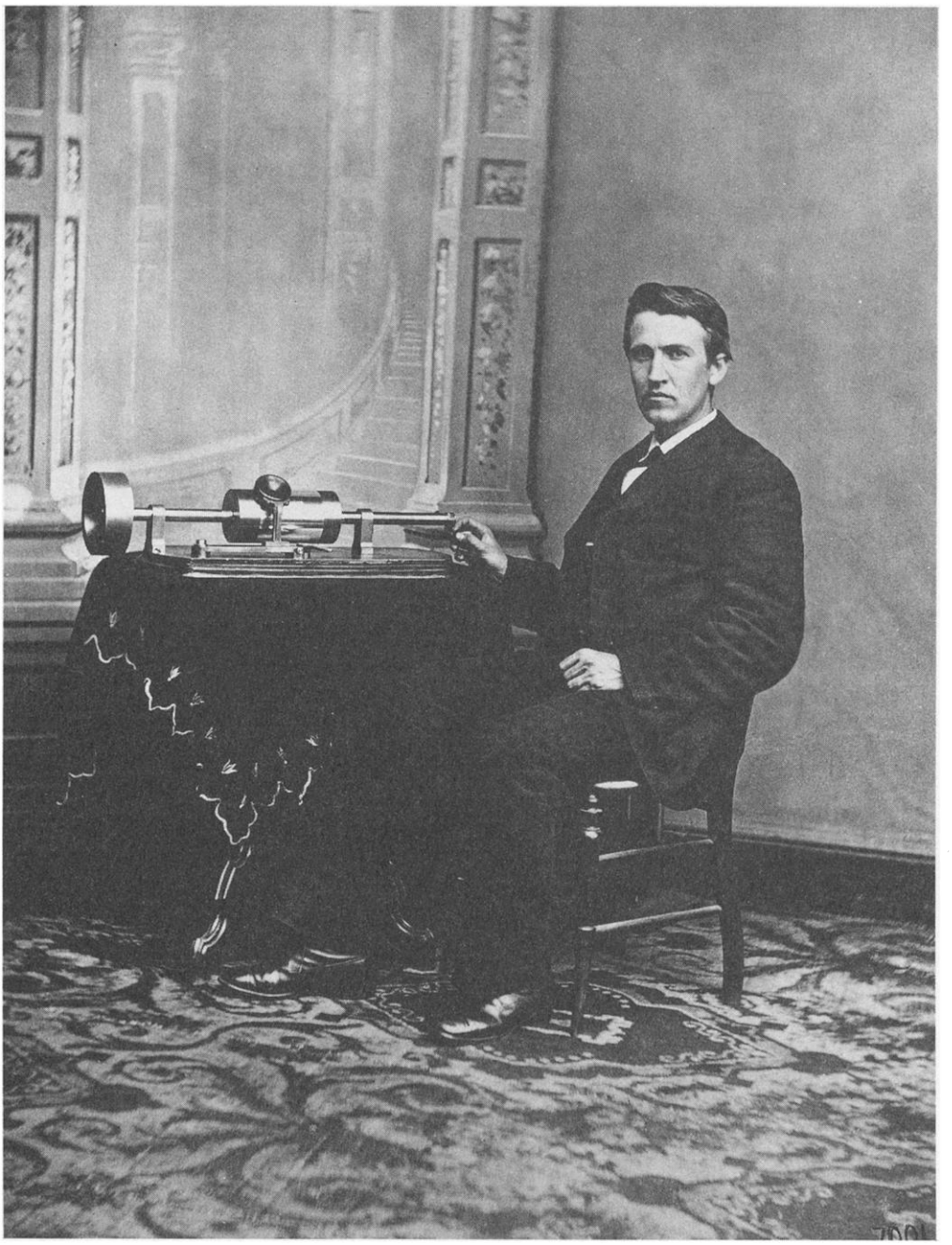


Figure 2. Thomas Edison with his phonograph in Washington, D.C., 18 Apr. 1877. Courtesy Edison National Historic Site

instrument has not quite reached that perfection when the tones of a Patti, or the speeches of a Gladstone, or the sermons of a Liddon, can be faithfully repeated; in fact, to some extent it is a burlesque or parody of the human voice."[25] Edison conceded that the quality of reproduction was not yet ready for Adelina Patti's voice "in all its purity."[26] Fidelity was thus related to function; performance that was sufficient for practical purposes was considered insufficient for conveying the art of opera's reigning diva.

In 1878 there was a concept of fidelity, but no single standard for evaluating phonograph performance existed because there was no single role or purpose for the invention to fulfill. The phonograph appeared before a need for its function had been identified. While numerous uses were projected, none were realized. When Edison set aside his latest invention and turned instead to the development of electric lighting, the phonograph disappeared. Few seem to have missed it or even to have noticed that it was gone.

Ten years later Edison "resurrected"[27] his phonograph. The perfected phonograph was greeted with the same exclamations and prophecies that had been set forth a decade earlier. The public remained unsure about the ultimate utility of the machine, but this time, Edison supplied a function. His phonograph was to be a business machine. It would record speech by engraving wax cylinders to create aural letters, which would be sent directly to, and played back by, the recipient.[28] Edison's phonograph returned with a purpose and a single standard of performance. As a capturer of words, it had to be intelligible: audible and articulate. "Fidelity" now referred to the retrievable truth of the message; an oral contract or agreement, committed to wax, was rendered permanent and therefore indisputable.

In spite of its potential for injecting both morality and efficiency into the workplace, the phonograph as office equipment was not a success. Stenographers opposed the machines, but the devices never worked well enough to threaten their jobs. Businessmen simply did not have time to fuss with the delicate mechanisms, and the local phonograph dealers, who were leasing machines on a regional basis, following the model of the telephone companies, were frustrated by the logistical problems associated with the business. At that time the "practical" use of the phonograph proved highly impractical.[29]

As the business application failed, however, a new use for the machine appeared. One enterprising dealer equipped his phonographs with a coin-operated mechanism that played a cylinder (featuring a popular tune or comic monologue) through a set of eartubes to the patron who had deposited the coin. In 1890, this dealer reported that

all of his company's profit came from these "nickel-in-the-slot" machines.[30] Phonographic music was soon being heard in saloons and hotel lobbies across the country.

In New York, gentlemen-about-town wandered from hotel to hotel, listening to the machines "until ten or fifteen hotels have been visited and the party have heard a little bit of the very latest things in town rendered with so startling and realistic effect that it seems almost impossible that the human voice can issue from wax and iron."[31] As the phonograph took on the role of a purveyor of music rather than simply a transmitter of words, standards moved beyond audibility and intelligibility. "Quality of tone" was the new criterion,[32] and advertisements began increasingly to point to "the sweet tone for which the Edison is famous."[33]

In 1896 the Edison phonograph was first offered for sale to the public, and as early as 1900 it was recognized as "a familiar object in our modern home life."[34] The phonograph was not just situated in modern home life; it played a role in defining that modernity, by being put to use in ways that distinctly changed the prevailing culture of music in the home.

3. The Machine in the Parlor

The musical life of turn-of-the-century middle-class Americans was divided between public and private spheres of activity. Public music existed in concert halls, where crowds gathered to hear the performances of gifted strangers. Private music was created within the home, by a family member or friend. This music provided domestic entertainment; it also manifested the diligence and cultural aspirations of the (usually female) performer. Victorian virtue, if not always virtuosity, prevailed.[35]

Earlier in the century the boundary between public and private music had not been so distinct. An occasional virtuoso like Jenny Lind or Louis Gottschalk was heard, but most public music was offered by town members in local bands or musical societies. During the second half of the nineteenth century professional musical organizations increasingly took hold in American cities, and by the turn of the century public music had achieved a level of technical skill and expertise that many amateurs at home felt unable and unwilling to match.[36]

The *Atlantic,* in 1894, recalled that there had been a time when the adjective "amateur" carried with it "respect, dignity and worth."

But now, "[a]mateur has collided with professional, and the former term has gradually but steadily declined in favor; in fact, it has become almost a term of opprobrium."[37] Jane Addams described the generational difference between a mother who believed herself to have possessed musical talent but lacked opportunity to develop it, and a daughter who, with all the advantages necessary to develop such a talent, knew herself to be lacking it: "I might believe I had unusual talent if I did not know what good music was."[38] And Edward Bellamy imagined a future in which all music, including domestic music, would be professionally rendered. When the nineteenth-century protagonist of *Looking Backward* was offered music by his twentieth-century hostess, the music that she had in mind was not at all what he expected:

> "Nothing would delight me so much as to listen to you," [he] said. "To me!" she exclaimed, laughing. "Did you think I was going to play or sing to you? . . . Of course, we all sing nowadays as a matter of course in the training of the voice, and some learn to play instruments for their private amusement; but the professional music is so much grander and more perfect than any performance of ours, and so easily commanded when we wish to hear it, that we don't think of calling our singing or playing music at all."[39]

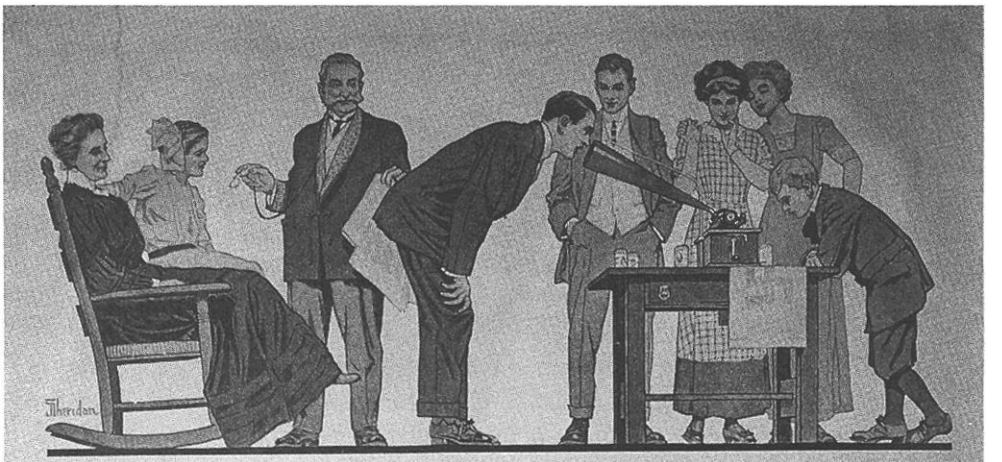
Bellamy's dream, however, was John Philip Sousa's nightmare. In 1906, Sousa predicted "a marked deterioration in American music and musical taste, an interruption in the musical development of the country, and a host of other injuries to music in its artistic manifestations, by virtue—or rather by vice—of the multiplication of the various music-reproducing machines." Sousa feared the replacement of music making with passive listening; the gradual silencing of the town band, the amateur singer and pianist, "until there will be left only the mechanical device and the professional executant."[40] "Wherever there is a phonograph the musical instrument is displaced. The time is coming when no one will be ready to submit himself to the ennobling discipline of learning music. . . . Everyone will have their ready made or ready pirated music in their cupboards."[41]

Sousa coined the derogatory term "canned music,"[42] and similar characterizations often appeared in popular literature,[43] but the bandleader's overly pessimistic opinion of the new musical technology was shared by few. As a respondent to Sousa's editorial put it, "No one who reflects upon the matter for a single moment will deny that the average rendition of music by the amateurs in the homes of our land is far, far below that of the mechanical music reproducer of

today. It is just because these devices bring into our homes renditions of music of a superior quality, to which the vast majority of our people are total strangers, that they are meeting with such universal acceptation."[44] As early as 1904 one noted music critic had already begun to celebrate the passing of "the piano girl,"[45] but phonographic technology would not simply assume her role without transforming the culture of domestic music in other ways, and in the process, phonographic culture itself would be transformed.

The phonograph offered many immediately apparent advantages to consumers. It provided a greater range of music than a household could traditionally produce; not just piano but band music and instrumental and vocal solos could all be called forth, inexpensively and at a moment's notice.[46] The phonograph effectively brought the quality and variety of public music into the home, and it additionally offered new kinds of activities. The Edison phonograph, for example, allowed one to make home recordings: "Talk about entertainment—there is nothing that approaches the fun and fascination of making records at home on the Edison Phonograph."[47] And there were other ways to enjoy the machine; some listeners ultimately became more interested in the phonograph recordings themselves than in the music that they reproduced. In 1907, *Littel's Living Age* described a type of person who endeavors to possess "perfect specimens of the recording art. To this man, the class of record is immaterial, his aim being only records for which clearness, volume and quality of tone are absolutely faultless."[48]

In spite of these new attractions and activities, the phonograph as a provider of domestic music still threatened to eradicate many of the cultural associations that had been attached to domestic music making. Consumers were still faced with the fact that their musical instruments had been replaced by "talking machines," or worse, "can openers." Their domestic music was no longer the individual creation of a living musician in the home but a mass-produced mechanical reproduction.[49] In order to make the phonograph acceptable, manufacturers, advertisers and consumers had to redefine the machine, visually, culturally, and acoustically. The phonograph could not just reproduce the sounds of musical instruments; it had to become an instrument itself. While phonograph advertisements had asserted that "this is not an imitation of music, but is indeed real music, performed by the artist the same as in one's actual presence"[50] as early as 1895 (just when the phonograph entered the home), this kind of appeal was increasingly made by manufacturers and accepted by consumers in the years that followed. By 1913, the Edison company consistently



Did you ever make a Phonograph Record?
Did you ever hear yourself talk, or sing, or play?

Talk about entertainment—there is nothing that approaches the fun and fascination of making records at home on

The EDISON PHONOGRAPH

THE EDISON will record what you or your friends say, or sing, or play, and then instantly reproduce it just as clearly and faithfully as the Records you buy are reproduced.

This is a feature of the Edison Phonograph you should not overlook. It is entertaining, instructive and practical. You can send your voice to a friend, preserve the sayings of children, record your progress as a speaker, a singer or a musician.

Anyone can make records on an Edison. It requires no special machine. The blank records can be used over and over.

Go to any Edison dealer to-day and let him demonstrate this great feature of the Edison Phonograph and when you buy make sure you get an Edison, the instrument that gives you not only the best renditions of the world's best entertainers, but also the opportunity for home record making.

There is an Edison Phonograph at a price to suit everybody's means, from the Gem at $15.00 to the Amberola at $200

Edison Standard Records . . . . . $ .35
Edison Amberola Records (play twice as long) 50
Edison Grand Opera Records . . . . . .75 to $2.00

There are Edison dealers everywhere. Go to the nearest and hear the Edison Phonograph play both the Edison Standard and Amberol Records and get complete catalogs from your dealer or from us.

The Edison Business Phonograph stands right at your elbow. With it, you dictate just as if you were talking to the man to whom you write.

National Phonograph Company, 11 Lakeside Avenue, Orange, N. J.

Figure 3. Edison Phonograph advertisement, *Saturday Evening Post,* 12 Nov. 1910

referred to its records not as reproductions but as "re-creations." The "re-creator," the phonograph, was no longer a machine but now a musical instrument.

4. The Diamond Disc and Edison Re-Creations

Thomas Edison's proclamation that the phonograph was about to become "the greatest musical instrument in the world"[51] coincided with the release of his new Diamond Disc phonograph. For years, the Edison company had maintained the superiority of the cylinder to the disc, but increased competition from the disc-playing gramophones of Victor and Columbia ultimately led the Edison company to enter the disc market.[52] Consumers preferred discs because they were sturdier and easier to handle and store, and manufacturers found the disc records far easier to mass produce, as they could quickly and easily be stamped from master dies. Hollow cylinders required a more complicated molding process to produce multiple duplicates from a master mold.[53]

Once the decision to enter the disc market had been made, the goal of the Edison company was to produce the best possible disc machine. Several years and several millions of dollars were spent on this project, and the result was a machine that differed from the competition in several significant ways. Countless experiments were carried out in the Edison laboratories to determine the best size and shape of groove, and the choice was made to stick with the "hill and dale" groove format that had been employed in Edison cylinders. The vertical undulations of this kind of groove were unlike the lateral "to-and-fro" undulations on the records of the other manufacturers, and the two formats were incompatible. Victor records could not be played on Edison machines and vice versa. The Edison company also designed a stylus with a diamond point, a needle that never required replacement, unlike the steel needles of the competition, which had to be replaced after just a few playings. Chemists working for the Edison company developed a new kind of plastic for the discs themselves, and countless other innovations were incorporated in the mechanism of the new machine.

Edison dealers, however, were forbidden to refer to the new product as a machine; they were told to call the Diamond Disc a "musical instrument." (The competition, of course, remained a collection of "talking machines.") Dealers were also encouraged to offer "recitals" featuring disc recordings by Edison's finest artists. At one such Diamond Disc concert in 1914, an old Edison Standard cylinder

THE BEAUTIFUL EDISON CONCERT HALL OF THE HOMER S. WILLIAMS COMPANY

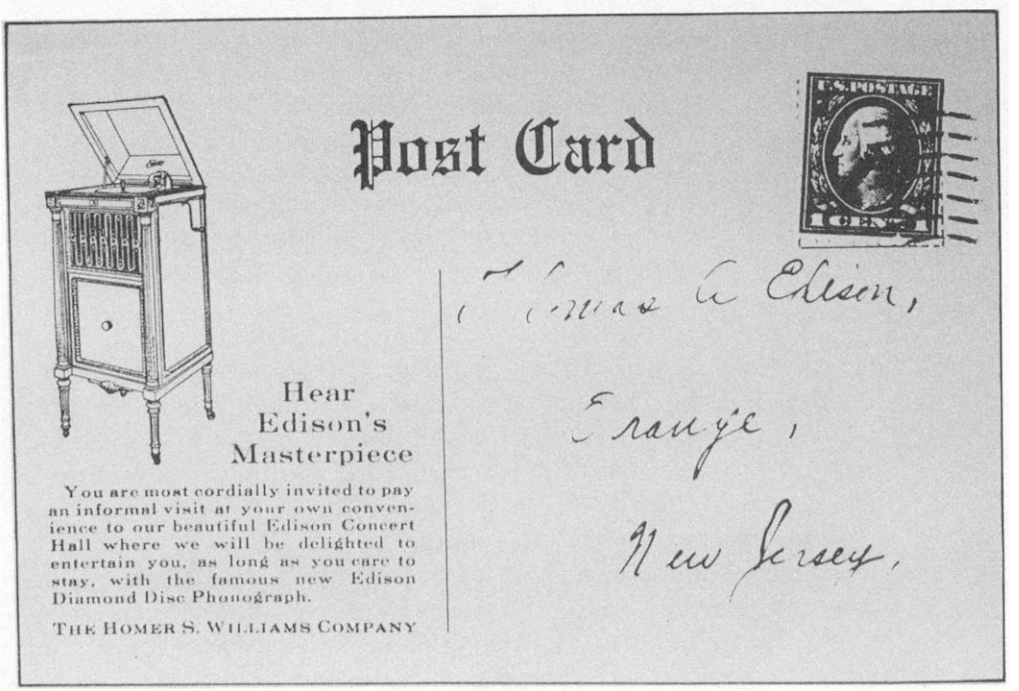


Figure 4. Invitation to attend a Diamond Disc recital at an Edison dealership, 1914. Courtesy Edison National Historic Site

was played, and the audience burst into laughter upon hearing it.[54] Apparently, more people had become aware of a difference between "good" and "bad" recordings. Music lovers critically compared not only old and new phonographs but also the various competing models of the day. One Edison dealer exclaimed, "[T]he people are so phonograph crazy and the Victor agent has filled them so full of tales which they are anxious to prove or disprove by the Edison machine that they are in the store here all day long and part of the night to form their own conclusions."[55]

What might a comparison-minded shopper encounter upon entering an Edison shop? The following dialogue was suggested in a 1915 publication for Edison dealers:

> HANDLING A CUSTOMER IN THE STORE
>
> SHOPPER: Do you claim to have something better than the Mineola?
>
> MR. BROWN: Comparisons are always odious. The Mineola has no superior—in the class to which it belongs. The Edison Diamond Disc is a more expensive instrument and in quite another class.
>
> SHOPPER: Is the Edison tone equal to the Mineola tone?
>
> MR. BROWN: The Edison has no tone.
>
> SHOPPER: No tone?
>
> MR. BROWN: Exactly that. Mr. Edison has experimented for years to produce a sound re-creating instrument that has no tone —of its own . . . If a talking machine has a distinctive tone, then such tone must appear in every selection, whether band, orchestra, violin, soprano, tenor or what not. In other words, there is a distortion of the true tone of the original music.[56]

That old "sweet Edison tone" had been designed out of the machine and also out of the advertising campaign. In order to efface the machine, the machine had to become inaudible. The goal was to provide an experience like that described by a reporter to the *Scientific American:* "The sound was lifted clear of the machine. The singer or musician was in the room, not in the box."[57]

Manufacturers effaced the machine not just by asserting its inaudibility but also by making it invisible. The claim that the phonograph was a musical instrument was reinforced by physically concealing the device in a fancy wooden cabinet. Early models, with exposed gears and horns, had celebrated their mechanism. The nickel-in-the-slot machines that had been located in bars and phonographic parlors in the 1890s, while of necessity housed in a protective cabinet, always

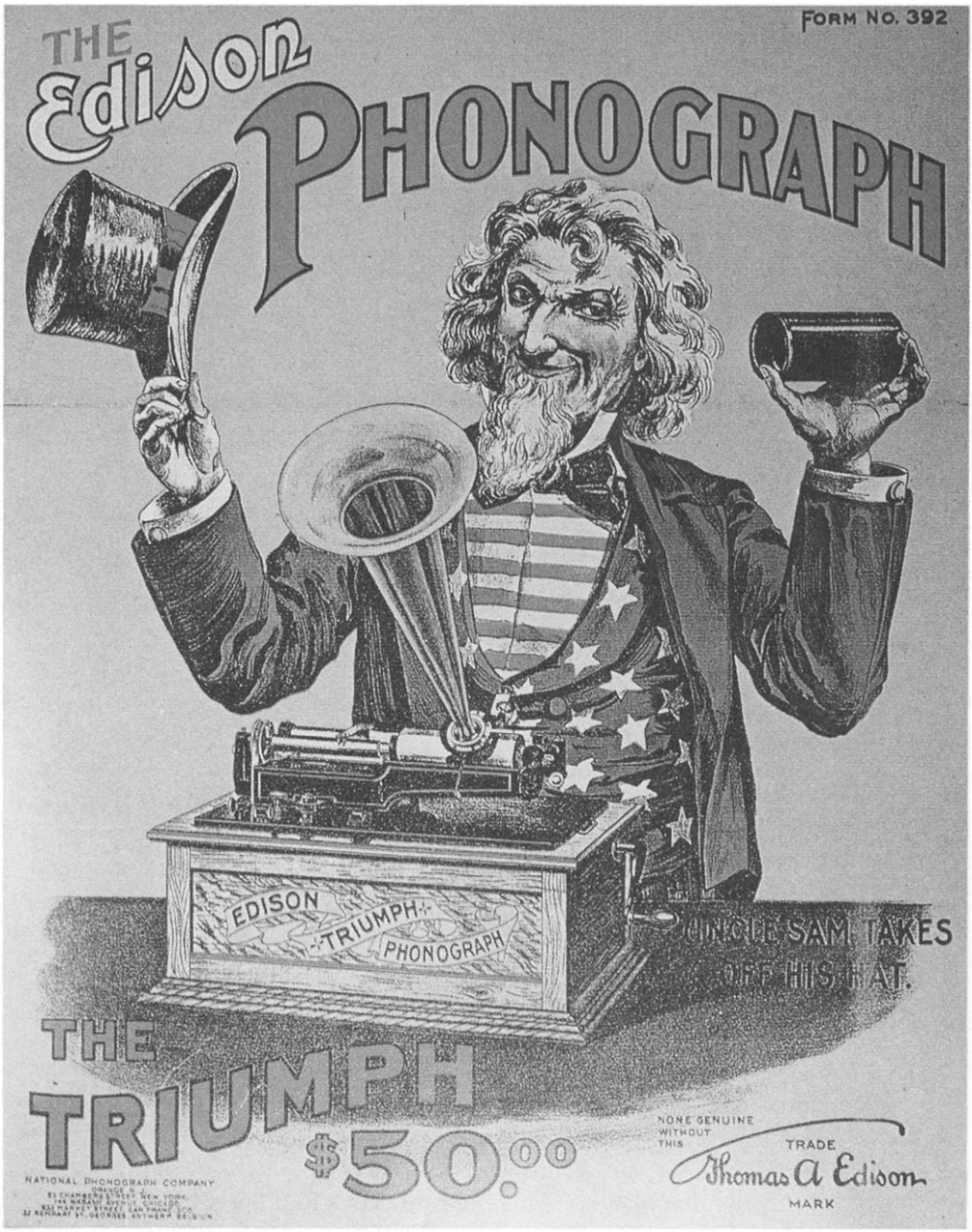


Figure 5. The phonograph as machine: Edison Triumph, circa 1910. Courtesy Edison National Historic Site

provided a glass window through which the patron could watch the internal workings of the machine—it was part of the entertainment that one purchased. But once the phonograph moved into the home, it was not long before the machinery became unsightly. The Victor Victrola of 1906 was the first major American machine to be sold in a cabinet that concealed the mechanism and the horn, and other manufacturers soon followed suit.[58] Edison Amberola cylinder phonographs were housed in wooden cabinets in a variety of styles, and the earliest Diamond Discs were placed in these same cabinets.

The style and quality of cabinet could send the price of a phonograph skyward; top-of-the-line machines cost about $250 when housed in a respectable but modest piece of furniture.[59] Fancier cabinets, in styles such as Chippendale, Elizabethan, Jacobean, Georgian, Italian, Colonial, and Louis XVI, to name but a few, easily drove the price of the same machine up to $400 and well beyond; a Sonora model with a list price of $1,000 was advertised in the *New York Tribune* in 1916.[60] That same year the Edison company offered a special collection of "handmade period cabinets." These "art models" were crafted by the W. A. French Company, and they made their debut to invited guests at a private exhibition in the ballroom of the Ritz-Carlton Hotel in New York. Starting at $1,000, the price rose to $6,000 for a large "French Gothic" piece, "[a]fter a celebration piece which stands in the centre of a room on the ground floor of the Hotel de Cluny."[61] For those who could afford it, the cabinet could re-create authentic antique artifacts, even as its mechanical contents re-created authentic music. However, the Edison company reassured its customers who could not afford such extravagance that "[t]hose who are concerned solely with obtaining the best musical result need not pay more than $250, as the Official Laboratory Model which sells at $250 is equal in musical sense to the most expensive models."[62]

The mechanical nature of the phonograph was further effaced by the Edison company through a focus upon the organic materials out of which the machine was constructed. "Music through metal is and always will be metallic and 'machine like,' " an Edison pamphlet from 1917 proclaimed. The text went on to describe how the reproducer of the New Edison was constructed of silk, cork, and a vegetable tissue diaphragm. "There are no acoustic properties in any of these materials. . . . The New Edison has no tone of its own. It is a perfect vehicle for the Re-Creation of music."[63]

Shortly after this ad appeared, an Edison owner named Edward Buckley stopped by a Sonora Phonograph shop in order to evaluate its "much advertised Bell-Like tone." Buckley felt compelled to write to

Figure 6. The phonograph as furniture: Edison phonograph advertisement, *Cosmopolitan*, Jan. 1917. The Chippendale style of cabinet is shown here.

the Edison Company and describe his experience: "[A]fter hearing several records on the Snorer [sic] the agent asked me what advantage I saw in the Edison reproducer, I having objected to the nazal [sic] tone of the high register of the vocal records. To which I replied that the fibre diaphragm coupled with the silken cord and the shape of the sound chamber removed the metallic twang."[64]

Clearly, the Edison advertising material provided Buckley with not just a vocabulary but a conceptual framework for evaluating phonographic performance. In one sense he seems to constitute the ideal manipulable customer, accepting and reiterating the Edison propaganda lock, stock, and barrel. But in another sense, Buckley only used the ad as a starting point. He did not simply accept the assertions of the ad as true, but instead went to a rival shop to decide for himself.

As a Brunswick ad put it, this was "a new era in phonographic art." The "novelty is past. Music lovers are more critical. Old standards do not satisfy,"[65] and the Edison dealers agreed: "The immense strides which Mr. Edison has made in the art and industry is developing an advanced appreciation of sound reproduction. It is a higher education."[66]

Consumers clearly put their education to use. They compared one phonograph to another to learn about and define for themselves what constituted sound quality, in order to choose the best machine and records for their homes.[67] But Thomas Edison's goal was not really to become the number one seller; in fact, his company never surpassed Victor in the market. Edison was interested in competition not with other musical reproductions but with "real" music itself. Thus, before he could fully accomplish his goal of transforming the Diamond Disc into a musical instrument, he would have to place it in direct competition with "the real thing."

5. The Tone Test Campaign

In 1915, the director of the Edison Phonograph Division published the following account of the first tone test: "A year or so ago in Des Moines, Iowa, Miss Anna Case, the Metropolitan prima donna, happened to enter the store of Harger and Blish, our jobbers at Des Moines, and was induced to sing in unison with one of her own records. While our distributors had all known that the tone of the Edison Diamond Disc was wonderfully true, none of them had realized that it was absolutely identical with and indistinguishable from the original."[68] The distributors did, however, realize the marketability of

this type of demonstration, and tone testing soon became the primary form of advertisement for the Edison phonograph.

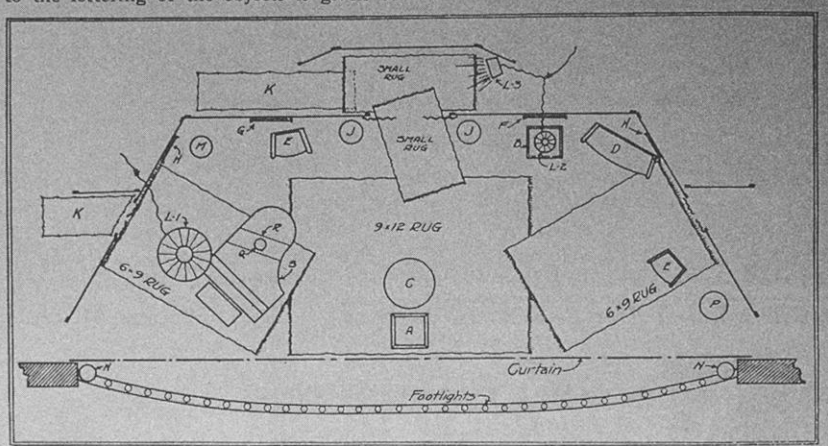
The structure and content of every tone test was rigidly determined by the Edison Company; an Engineering Test Service Department was established in 1917 to establish and ensure standard procedure for the events.[69] Contracts specified that local dealers were to provide a suitable place of performance "in which it is customary to give high-class musical entertainments and in which high-class artists are accustomed to appear, and in no case shall the place of performance be a place which, by reason of its location or the uses made of it, is not frequented by the better class of people."[70] The dealers mailed invitations to prospective customers (no admission was charged), hired ushers and a "light man," and supplied the $295 Diamond Disc phonograph used for the comparison. The machine was to arrive at the site four hours prior to the start of the performance and was to be inspected after arrival. A backup machine, also inspected, was additionally required. Promoters were required to use only official Edison company advertising, both before and after the event, and they were instructed to fill out and submit to the company a standard post-event information form. An internal publication for dealers even suggested the best arrangement of phonograph and other objets d'art on stage to create a "tasteful" atmosphere.[71] In return for meeting the numerous requirements, the local dealers were provided with the musical services of Edison recordings artists, and their advertising costs were subsidized.

One of the first tone tests took place in Symphony Hall in Boston on 18 November 1915. Contralto Christine Miller was featured, and Edison recording artists Arthur Walsh and Harold Lyman, on violin and flute, also participated before an audience of about five hundred, many of whom were members of Boston's Handel and Haydn Society. The program opened with introductory remarks by an Edison representative appropriately named Verdi Fuller. Miller then sang "O Rest in the Lord," and "Abide with Me," in tandem with "The Laboratory Re-Creation of Her Voice." Walsh and Lyman did not perform duets with themselves in this way but instead played along with orchestral recordings or other recorded soloists. The tone test was considered most effective and convincing with the female voice; thus, women were almost always the featured performers. Miller returned to the stage, singing "Ah, mon fils!" by Meyerbeer and some Scottish folk songs; her numbers were interspersed with the playing of some particularly prestigious Edison re-creations such as Arthur Middleton's recording of the Pro Peccatis of the *Stabat Mater* of

The Tone-Test and Its Stage Setting

THE Edison Tone-Test season opened on September 1st, and seventy-five artists are now on tour in the United States and Canada. Before Christmas comes they will have presented the now famous Tone-Test more than two thousand times. Their advertising value to the dealer, artist, and Edison instruments and RE-CREATIONS is incalculable.

The pleasure and impressiveness of a Tone-Test can be made greater if tasteful attention is directed to the scenery and setting on the stage. Mr. Addison N. Clark, Manager Sales Promotion Department, Edison Phonographs, Ltd., of San Francisco, has very cleverly sketched a stage plan that is full of valuable suggestions. The key to the lettering of the objects is given below:

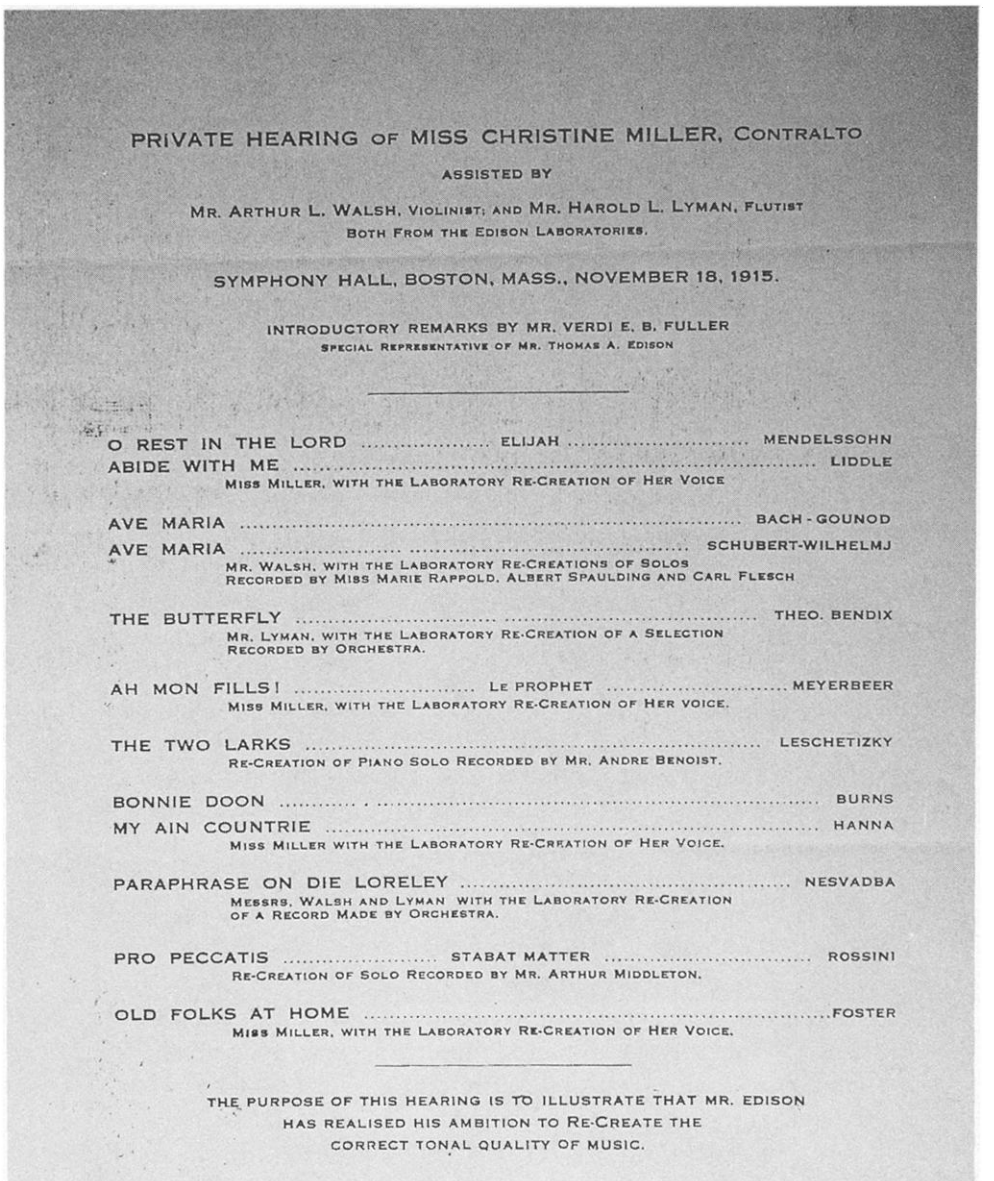


A—Main phonograph (should be a mahogany Chippendale)
B—Secondary phonograph (William and Mary, or Art Model suggested)
C—Mahogany stand for RE-CREATIONS used by artists.
D—Small Davenport or settee, mahogany, upholstered.
E-E—Chairs to match Davenport.
F—The best framed picture of Mr. Edison you can produce.
G—Picture suitable to "balance" F (May be a landscape).
H-H—Other suitable framed pictures—landscapes suggested.
J-J—Mahogany pedestals bearing imitation marble busts of composers (or the real thing, if available).
K-K—Unbleached muslin or cheesecloth "runners," tacked down, to protect the artist's gown at her entrances.
L-1—Practical floor lamp (one with mahogany pedestal suggested).
L-2—Practical boudoir lamp with silk shade to harmonize with L-1.
L-3—Bunch light with amber globes to illuminate entrances.
M—A good-sized palm, or a small one on a mahogany stand or pedestal.
N-N—Palms or large fern pots, set so as not to interfere with curtain.
P—Another palm or fern is effective here.
Q—Bowl of flowers or pot of ferns.
R—Throw scarf or "runner"—to harmonize with general color tone.
S—Grand Piano (mahogany) if possible.

Worthy of special attention is the idea of borrowing an Edison from an owner for use at the Tone-Test, and letting it be known that the startling duplication of voice is achieved on an instrument from the home of an Edison owner. K-K are not needless refinements, according to Mr. Clark, who believes that the costly gowns of the artists should be protected from the floor.

"WHAT MUSIC WILL DO FOR YOU"

Figure 7. Edison dealer's suggested stage setting for tone tests, *Edison Diamond Points*, Nov. 1920. Courtesy Edison National Historic Site



PRIVATE HEARING OF MISS CHRISTINE MILLER, CONTRALTO

ASSISTED BY

MR. ARTHUR L. WALSH, VIOLINIST; AND MR. HAROLD L. LYMAN, FLUTIST
BOTH FROM THE EDISON LABORATORIES.

SYMPHONY HALL, BOSTON, MASS., NOVEMBER 18, 1915.

INTRODUCTORY REMARKS BY MR. VERDI E. B. FULLER
SPECIAL REPRESENTATIVE OF MR. THOMAS A. EDISON

O REST IN THE LORD ..... ELIJAH ..... MENDELSSOHN
ABIDE WITH ME ..... LIDDLE
MISS MILLER, WITH THE LABORATORY RE-CREATION OF HER VOICE

AVE MARIA ..... BACH-GOUNOD
AVE MARIA ..... SCHUBERT-WILHELMJ
MR. WALSH, WITH THE LABORATORY RE-CREATIONS OF SOLOS
RECORDED BY MISS MARIE RAPPOLD, ALBERT SPAULDING AND CARL FLESCH

THE BUTTERFLY ..... THEO. BENDIX
MR. LYMAN, WITH THE LABORATORY RE-CREATION OF A SELECTION
RECORDED BY ORCHESTRA.

AH MON FILLS! ..... LE PROPHET ..... MEYERBEER
MISS MILLER, WITH THE LABORATORY RE-CREATION OF HER VOICE.

THE TWO LARKS ..... LESCHETIZKY
RE-CREATION OF PIANO SOLO RECORDED BY MR. ANDRE BENOIST.

BONNIE DOON ..... BURNS
MY AIN COUNTRIE ..... HANNA
MISS MILLER WITH THE LABORATORY RE-CREATION OF HER VOICE.

PARAPHRASE ON DIE LORELEY ..... NESVADBA
MESSRS. WALSH AND LYMAN WITH THE LABORATORY RE-CREATION
OF A RECORD MADE BY ORCHESTRA.

PRO PECCATIS ..... STABAT MATTER ..... ROSSINI
RE-CREATION OF SOLO RECORDED BY MR. ARTHUR MIDDLETON.

OLD FOLKS AT HOME ..... FOSTER
MISS MILLER, WITH THE LABORATORY RE-CREATION OF HER VOICE.

THE PURPOSE OF THIS HEARING IS TO ILLUSTRATE THAT MR. EDISON
HAS REALISED HIS AMBITION TO RE-CREATE THE
CORRECT TONAL QUALITY OF MUSIC.

Figure 8. Program, Christine Miller tone test, Symphony Hall, Boston, 18 Nov. 1915. Courtesy Boston Symphony Orchestra Archives

Rossini. The program closed with Miller and her re-creation singing "The Old Folks at Home." The *Boston Evening Transcript* reported that Miller "gave various combinations of her own voice with the 'record' but in all cases with the mechanical musical accompaniment. First was heard Miss Miller's voice and then her 'record'; then there were the alternations of the voice and the record in phrases so that it was at times difficult to distinguish which one heard[,] the voice or the 'record' unless the lips of the singer were watched, and in the last piece the lights were turned low so that the singer's lips could not be seen."[72]

One year later, Marie Rappold sang along with her Edison re-creations at Carnegie Hall in New York, and "the immense auditorium of this temple of musical art was crowded to its capacity"[73] of about 2,500 persons. In 1919, she appeared, again to a capacity crowd, at Carnegie Hall in Pittsburgh; by this time the theatricality of the event was fully developed. The significance of the "light man" called for in the tone test contract was now clear: "It did not seem difficult to determine in the dark when the singer sang and when she did not. The writer himself was pretty sure about it until the lights were turned on again and it was discovered that Mme. Rappold was not on the stage at all and that the new Edison alone had been heard."[74]

Perhaps the most notable tone test was that performed by Anna Case at Carnegie Hall in New York on 10 March 1920. In a program much like Rappold's earlier recital in that hall, Case sang alongside Edison re-creations of her voice in "Depuis le jour," from Charpentier's *Louise,* "Quando m'en vo," from Puccini's *La Bohème,* and a selection of Scottish folk tunes ("Mighty Lak a Rose" and "My Laddie"). A re-creation (without the live artist) by Arthur Middleton was played, and pianist Victor Young, violinist Willard Osborne, and flutist William Reed all played minor roles in the program. The program closed with Case and her re-created voice singing "Home Sweet Home" (Program, 10 March 1920, Carnegie Hall Archives).

A month earlier, H. H. Blish, of Harger and Blish, the Des Moines dealer who had spontaneously sponsored the very first tone test (also by Anna Case), received a letter from the Edison Company:

> Miss Case will probably appear in a Tone Test Recital, at Carnegie Hall, New York on March 10th. This is expected to be a very interesting event and special emphasis will be placed on the so called dark scene, where the artist steals from the stage, while the phonograph is playing. If we look back to the time when Miss Case gave her first

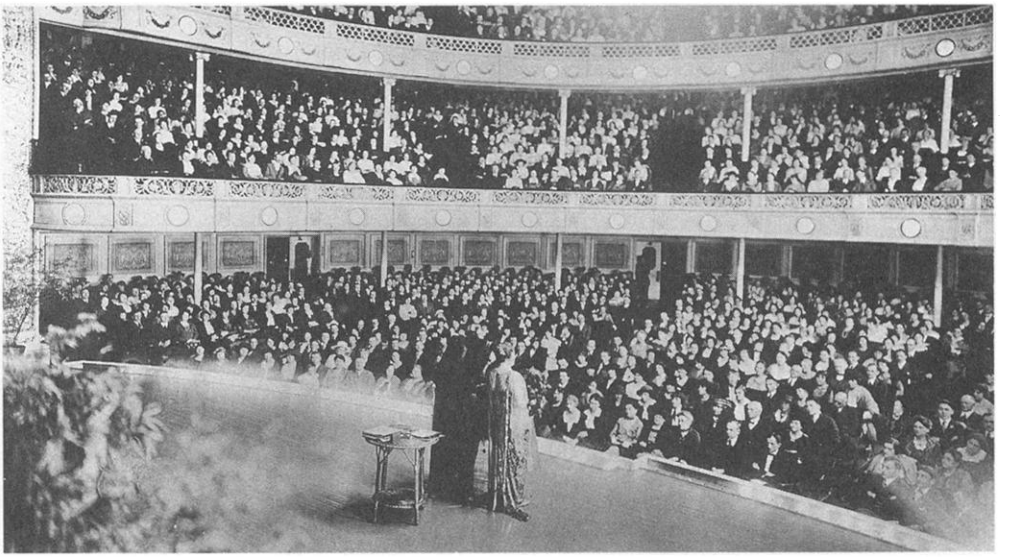


Figure 9. Marie Rappold tone test, Carnegie Music Hall, Pittsburgh, 30 Sept. 1919. Courtesy Edison National Historic Site

> impromptu Tone Test in your store, and then consider her appearance at Carnegie Hall next month, we get a very good conception of the progress that has been made.[75]

While "progress" was indicated in the ascent from Harger and Blish to Carnegie Hall, perhaps another more significant measure might be the sheer number of tone tests that were presented in the interval. Between 1915 and 1920 the Edison company sponsored over four thousand tone tests; twenty-five sets of artists were scheduled to perform more than two thousand tone tests in 1920 alone.[76] An Edison ad from January of 1917 indicated that three hundred thousand people had heard tone tests, and one undated scrapbook clipping in the Edison archives indicates that a total of two million people had attended the events.[77]

Of those thousands of tone tests, only a small fraction were held in places like Carnegie Hall and Symphony Hall. And only a small fraction of the tone tests utilized the musical talents of Edison's most prestigious recording artists. Rappold and Case were both associated with the Metropolitan Opera of New York; they were considered "special artists" and thus spared much of the grind of touring that was standard for most tone test artists.[78] There were really two types of tone tests. While special artists performed occasionally in the lavish

concert halls of large cities, less well known artists traveled extensively, appeared primarily in small towns, and performed under much less impressive conditions.[79] Only would-be stars, new recording artists who perhaps aspired to the Met, would tolerate the nonstop touring and endless performing in assorted Elks lodges, churches, and high school auditoriums.[80]

Some never even made it this far; a Mrs. VanHuff auditioned twice at Edison's New York studios for the privilege of being a tone test artist. Even with considerable practice after her first failure, she was rejected a second time.[81] An internal memorandum reveals that musical skill was not necessarily the only requirement: "Mr. Edison, Here is a trial record of Miss Shenk sent here by Mr. Blish who wants to use her for tone testing. She has some shake [vibrato or tremolo] but otherwise sounds pretty good. She is a fine looking woman and would be just the cheese for the purpose."[82] While the Handel and Haydn Society of Boston was tone tested with the Metropolitan Opera singer Christine Miller, the upstanding citizens of small towns like Henryetta, Oklahoma, were more likely to get someone like Miss Sanderson Fagan, an artistic whistler. Still, the format and structure of the small-town tone tests were just as rigidly defined and monitored. In 1921 Arthur Walsh received a telegram from a tone test artist named Sokoloff, informing him that the local dealer in Kiowa, Kansas, had given a tone test in conjunction with a "moving picture show" and had charged admission for the event.[83] Such infractions seem not to have happened very often, and it is clear that the small-town events were as popular as the "special events" held in big cities. Tone test artist Marie Morrisey offered an honest explanation of her appeal: "One of the best things about tone tests is that they bring artists into towns that aren't big enough to afford good concerts otherwise. Why, small as I am, I'm the greatest artist some of these towns have ever heard—and don't they appreciate it!"[84] Tone tests offered something new: a glimpse of what the tone test local contract had identified as "high class musical entertainments." An Edison pamphlet from around 1921 indicated that "[t]he very presence of a New Edison in your home speaks eloquently and convincingly of your musical culture and discriminating taste,"[85] and the tone tests further allowed Edison customers in small towns and big cities alike both to acquire and publicly display their "musical culture." Sometimes, however, this culture had to be translated for less cosmopolitan audiences. For instance, the 1915 Christine Miller tone test in Boston's Symphony Hall included on the program "Ah, mon fils!" by Meyerbeer. The same program, given in Des Moines, offered "Ah, My Son!"[86] The

Edison company was clearly appealing to the cultural pretensions of a certain segment of the population, and the external trappings of the tone test—"high-class" location, European "classical" music on the program—were enough to satisfy those pretensions even when the live performer was not quite from the Metropolitan Opera of New York.

The "special artists" themselves, in fact, were not as renowned in the world of opera as the Edison advertising proclaimed. Indeed, the Edison company was infamous for its lack of real stars, most of whom recorded for Victor. A Victor ad from 1917 posed the question:

> If you had your choice of attending two concerts—the greatest artists in all the world appearing at one, some little-known artists at the other —which would you choose? You would quickly decide to hear the renowned artists who are famous for their superb interpretations. And this is exactly the reason why the Victrola is the instrument for your home. The world's greatest artists make records for the Victor exclusively:
>
> Caruso, Alda, Braslau, Calvé, Culp, de Gogorza, De Luca, Destinn, Elman, Farrar, Gadski, Galli-Curci, Garrison, Gluck, Hempel, Homer, Journet, Kreisler, Martinelli, McCormack, Melba, Paderewski, Powell, Ruffo, Schumann-Heink, Scotti, Sembrich, Tetrazzini, Whitehill, Williams, Witherspoon, Zimbalist.[87]

Thomas Edison, who personally approved or rejected not just each artist who auditioned for the company but each record made by those who passed their auditions, felt that it was a waste of money to pay extra for "names" when there were less well known artists who, in his opinion, performed better than did the stars.[88] Anna Case, for example, was not a prima donna of stature equal to, say, Amelita Galli-Curci or Nellie Melba.[89] And while Edison company advertising could raise a roster of foreign-sounding names from the Met and other prestigious organizations, the most renowned of those listed usually had only a limited relationship with the company, perhaps recording a few numbers before moving on to Victor or Columbia and seldom going out on the tone-test circuit.[90]

So, the "special artists" were not quite as special as they might have been. The popularity of the Tone Tests hardly seems to have been affected by this; indeed, it appears that Victor advertising had to take on the task of educating much of the record-buying public about who the stars really were. Many people didn't know or didn't care, and the allure of high-class musical culture was only part of the appeal of the tone test. Tone tests additionally provided an opportunity for audiences to engage in the critical listening that many had already

undertaken in their homes or in phonograph shops. They accepted the novel challenge by the Edison company to distinguish live artist from re-creation, and the result of their experiences varied from listener to listener. While Edison advertising uniformly proclaimed that not a single tone test attendee could distinguish live artist from Edison re-creation, newspaper reviews of the events indicate that listeners responded in a variety of ways.

6. Listeners' Responses to Tone Tests

When the *Boston Evening Transcript* reviewed Christine Miller's 1915 tone test, the paper called readers' attention to the "curious and interesting tests" that had been conducted at Symphony Hall. The writer noted that "the question has been constantly arising" as to how closely phonographic reproductions resembled the original performance of the music and that "perhaps there has been no better opportunity offered in Boston for forming an opinion on this matter."[91]

Of Miller's portion of the program, the reviewer concluded that it was impossible to tell the difference between the voice or the record unless one watched the singer's lips. Yet the *Transcript* reported that she "adjusted the power of her voice to that of the 'record' with skill and the reproduction was closely imitative."[92] It is not clear what "the reproduction" refers to here; is it Miller's reproduction of the recording or the recording's reproduction of her? This same ambiguity is evident in a review of Anna Case's Carnegie Hall tone test of 1920: "As for the tone, though the phonograph produced a really lifelike sound, Miss Case had a little the best of the argument. But when it came to style, the record generally excelled. She was too much concerned with keeping up with her records to think of style."[93] The reviewers for the *Transcript* and the *Telegraph* accepted the premise of comparing voice and record and generally conceded the lifelike sound of the record, but in the process of evaluation they inverted the Edison company's definition of which performance was authentic and which was imitation.[94]

The *Transcript* reporter went on to point out the qualified nature of the violin portion of the tone test, in which the violinist Arthur Walsh played alongside not his own re-creations but those of the more celebrated artists Albert Spaulding and Carl Flech. Since these recordings had been made by different artists on different instruments, the comparison was not nearly as telling. Still, the writer noted: "The quality of tone was of the 'o' effect, and not the admired 'ee' which is

so pronounced in violins of the Cremona school. The 'record' quality of tone was somewhat veiled as in thin wooded violins and instruments of the Maggini-Brescian type."[95] Although the *Transcript* offered criticism, the reviewer accepted the premise of the comparison and was clearly engaged in the kind of critical listening that the tone test encouraged.

Others responded by rejecting the entire premise of the comparison. One reviewer, commenting in the *New York Tribune* on Marie Rappold's 1916 Carnegie Hall tone test, adopted a sarcastic tone, personifying the phonograph in a way that made the Edison company's claims seem absurd: "the singer bowed, patted her stiff-jointed mahogany friend on the back and left it to amuse the audience with a piano solo." The writer was not convinced that the "dumb and unresponsive machine" was any different from any other phonographs, and concluded:

> The secret of the new phonograph lies in the fact that Edison has been able to reproduce the overtones in musical sounds. These overtones, of which the domestic phonographs have been so long deprived, are apparently the intangible essence of music. Now that they have been captured it is easy to imagine visions of future voiceless and instrumentless operas and concerts. Given a battery of mahogany overtone producers and enough romantic scenery . . . there should be no future need of paying gigantic salaries to mere human beings.[96]

When Case appeared in Carnegie Hall four years later, one reviewer interpreted the event as an opportunity not to compare the tonal quality of voice and record but instead to consider perhaps more fundamental implications of the recording process: "Can a singer sing as well by herself in a small room as in a large crowded concert hall? Is the inspiration which comes from an audience necessary to bring out all that is best in a voice? Can the element of personality ever be eliminated from singing? These were some of the questions that confronted a large audience which attended a unique concert yesterday afternoon in Carnegie Hall."[97]

Most press accounts of tone tests, however, were neither as thoughtful as those in the *Boston Evening Transcript* and the *New York Evening Telegraph* nor as sarcastic as that in the *New York Tribune*. More typical was a short piece describing the event as a resounding success and a confirmation of Edison's achievement: "Not a person in the audience was able to say whether Miss Miller was singing or the new Diamond Disc phonograph was playing, and all were convinced that the instrument is all that Mr. Edison claims for its absolute and

true re-creation of the human voice. . . . Mr. Edison's wonderful instrument presents the complete gratification of the musical desires of the most cultured and aesthetic tastes in music."[98] Over and over, the claims were confirmed. Over and over the same words appeared; in fact, the same sentences and paragraphs appeared. In Pittsburgh, Marie Rappold's 1919 tone test was described in almost identical prose in several different papers. Only the headlines differed; while the *Post Gazette Times* submitted "Phonograph Reproduction Rivals Voices of Singers," the *Dispatch* exclaimed "Miracle Songs Create Furore [*sic*]."[99] Copy used in Pittsburgh appeared as far away as Stanwood, Washington, in an account of Helen Clark's 1921 tone test.[100] The *New York Tribune* had pointed to the presence of the "press agent" in 1916, and it is clear that these agents were still hard at work in 1920. The *Stanwood News* editor even appears to have neglected to customize the provided prose before setting up the type. Apparently this tone test (and perhaps many others on this tour) was to have commenced with an announcement that the artist would be late, so the program would start with a phonographic re-creation of her voice. Clark was then to appear in the auditorium and begin to sing along with her re-creation. She would either arrive on stage from behind the scenes or enter from the rear of the hall and walk to the front. As the paper reported, "Helen Clark's golden notes, emanating from the grille of the New Edison, soared over the auditorium in all their beauty. Suddenly we heard another voice, or rather the same voice, coming from the rear of the auditorium (or behind the scenes). Helen Clark had arrived and was singing in unison with her RE-CREATED self."[101]

In these accounts the distinction between newspaper news and advertising copy has been obscured. The fact that the internal account generated by the Edison company appeared not only in the follow-up advertisements that the local dealers placed in their towns' papers but also in the columns clearly designated as reported news may have influenced some listeners' reactions to the tone test. But it is also clear that many may not have been interested enough in the issue of fidelity to be convinced by pseudo-reporting, let alone by personal experience.

Many reviews of tone tests simply presented accounts of enjoyable evenings of music, with little if any discussion of fidelity. "Concert Pleases Lovers of Music—Singers at Keyler Grand Theater Give Splendid Musical Program during Evening," announced the *Walla Walla [Washington] Union.* The account devoted much more space to the singers than to the phonograph.[102] While the *Montesano [Washington] Vidette* headlined "Machine Imitates Nature—Re-Creation of Human Voice at Concert Perfect is Verdict," the paper described

"frequent encores [that] called the singers out after the program had been completed, singing a number of songs with piano accompaniment and without the re-creation of the phonograph, so well pleased was the audience with the voices of the singers."[103] Obligatory amazement at Edison's achievement was expressed, but it is clear that the audience enjoyed the living artists much more than they did the machine, or the opportunity to compare the two. The Liederkranz Society of Peoria, Illinois, presented Christine Miller with a basket of lilies and roses after her performance, and the next day the Peoria paper headlined its account "Miss Miller Heard."[104] A Canadian phonograph dealer wrote to the Edison company in 1922 indicating that his audiences preferred established tone test artists to new performers, because they "want to see artists with works in the catalogue."[105] By seeing in person the musicians whose records entertained them at home, audience members were able to "personalize" their records; not in the way that Edison proposed, through tonal equivalence, but instead through human association.[106] By 1922, however, most audience members were initially exposed to new music through records. A tone test might come through town and enable them to associate their recordings with the living artist who had recorded them, but by this time they had already accepted their recordings as "real music."

7. Conclusion

Tone tests were received and interpreted in a number of ways; audience members actively engaged with the format imposed by the Edison company and made it their own. Indeed, this engagement was encouraged. Official follow-up advertisements, while failing to acknowledge the wide variety of audience responses, still emphasized the "personal" nature of the individual's reaction: "Proved! Yesterday! to Walla Walla! No Difference! The end of the concert found the audience absolutely and completely convinced through its own personal experience, that there is no difference between an artist's living performance and its Re-Creation by the New Edison—that listening to the New Edison is, in literal truth, the same as listening to the living artists."[107]

Still, the question remains: did most, or even many, people actually conclude that the living performance and its re-creation were acoustically indistinguishable? Modern listeners, attuned to digitally recorded and reproduced stereo sound, may find it hard to believe that audiences were unable to distinguish between the artist and the record. It would be easy to credit the success of tone tests to the Edison company's strategy of having the performers conscientiously

imitate the sound of their recordings, but this simple explanation fails to recognize the fact that Edison Diamond Discs represented the pinnacle of the technology of acoustical recording and sounded far better than anything that had preceded them.[108]

Ultimately, the problem of determining whether or not audiences truly mistook the record for the artist is of limited significance. While people may or may not have agreed with the officially proclaimed outcome, it is clear that tone tests provided listeners with a tool, a resource, that enabled them to transform their conception of what constituted "real music" to include phonographic reproductions.

In order to accomplish this transformation, however, limits had to be defined. In 1916 the Aeolian company presented its Vocalion phonograph in a campaign similar to tone tests in that the goal was to present their machine as a musical instrument. Here the emphasis was placed not on critical listening and comparison to live performance but instead upon actual manipulation of the phonograph's tone. The Graduola, a shutterlike device that acted as a volume control, was featured. With the Graduola (according to the advertisement, "[A]nyone may render a record to suit his individual taste. This is a wonderful privilege . . . It means that every one may find in the Vocalion a medium for the expression of his own music instincts."[109] The Graduola constituted an attempt to equate the playing of records with the playing of an instrument. The attempt did not succeed. In spite of the shared terminology still in use today, few people accept this equation. Tone tests, in contrast, equated listening to records with listening to musical instruments and to live vocal performances. This equation has become commonplace.

By drawing upon a culture of imitation "fascinated by reproductions of all sorts,"[110] the tone test campaign helped move phonographic culture beyond this stage to a point where phonographic reproductions could become musical "reality itself." By effacing the mechanism of the machine, by blurring the distinctions between public and domestic music, by personalizing the musical reproductions, and by cloaking them in all the traditional trappings of an elite musical culture, the tone test campaign enabled people to equate listening to records with listening to live music and thus to turn phonographic reproductions into "real music."

8. Epilogue: The End of an Era

Within a year of Anna Case's appearance at Carnegie Hall the tone test campaign began to enter a decline from which neither it nor the

Edison Phonograph Company would recover. Starting in 1921, tone test tours suffered numerous local cancellations. Audiences dwindled, dealers began to question the cost effectiveness of the events, and the Edison company itself eventually lost interest in the campaign.[111] In 1926 Edison recording artist Alice Verlet wrote to Arthur Walsh expressing her desire to undertake a tone test tour upon returning from travel abroad.[112] Walsh responded, "At the present time we are only giving a few Tone Tests and expect to discontinue them within a few months, as we are going to devote our money principally to advertising in magazines and newspapers."[113]

Tone testing endured almost as long as did the acoustical recording process. By 1925, competition from radio brought about a sharp decline in phonograph sales, and the record companies that best withstood the new competition were those like Victor and Columbia, whose "star power" proved a stronger sell than Edison's fidelity. On 7 November 1929 the *New York Telegram* reported, "Thomas A. Edison, whose invention of the phonograph in 1877 has brought the world's best music and musicians to the homes of countless millions . . . has made his last phonograph record."[114]

At first the technical novelty of radio distracted listeners from their now-ordinary phonographs. As radio broadcasting developed, the timeliness and "connectedness" provided by the etherial networks offered something new and desirable that the phonograph was unable to match.[115] Additionally, and perhaps most significantly, by introducing electroacoustically generated sound into the home, radio helped bring about a change in taste regarding the kind of sound that people desired. A radio loudspeaker sounded very different from an acoustical phonograph, and when people chose radio, they chose this new sound. The phonograph industry was soon inundated by a "flood of radio-generated public demand for more bass, more volume."[116]

In response to this demand the new electroacoustic technology was soon applied to the phonograph itself, first for recording and then for reproduction in the home; thus the new sound came to be associated with the phonograph as well as with radio.[117] A 1927 ad for the Victor Orthophonic described the sound of the new phonographic music as "Vivid! Lifelike! As radically different as the modern motorcar in comparison to the 'horseless carriage.' And the new Orthophonic Victor Records, recorded by microphone, have a *character of tone* that is pleasing beyond description. Rich. Round. Mellow."[118] When microphones entered the recording studio, not only did a new kind of sound result, but a generation of meticulously acquired craft knowledge was rendered obsolete. Recording engineers had to relearn

their craft, and many years would pass before their work would again be publicly compared to live performance.

Tone-test–like comparisons were finally reintroduced in the 1970s by Memorex, but the format utilized by Memorex differed fundamentally from the Edison company's original campaign. Memorex "tone tests" appeared on television, and the consumer was never directly exposed to the "real" musician. An audiovisual reproduction of Ella Fitzgerald was compared to an audiovisual reproduction of an audio reproduction of Fitzgerald's voice, and the equivalence was demonstrated not by challenging the consumer to discriminate but by reproducing an image of a shattering glass.[119] Perhaps our own definition of what constitutes "the real thing" today has moved even further from the human origins of "reality itself."

Notes

I am indebted to countless friends and colleagues who have read and responded to earlier drafts of this essay. I particularly thank Thomas Levin, Michael Mahoney, Charles Gillispie, Edward Pershey, Cyril Ehrlich, Paul Lucier, William Jordan, and the members of the Davis Center for Historical Studies at Princeton University. I also thank the staff of the Edison National Historic Site.

1. "Edison Snares Soul of Music," *New York Tribune,* 29 Apr. 1916, 3.

2. "Demonstrate New Edison Invention," *Boston Journal,* 19 Nov. 1915. Clipping book, Edison Archives, United States Department of the Interior, National Park Service, Edison National Historic Site (hereafter referred to as Edison Archives).

3. Sousa's views will be discussed later in this essay. Theodor Adorno, "On the Fetish-Character in Music and the Regression of Listening" (1938), in *The Essential Frankfurt School Reader,* ed. Andrew Arato and Eike Gebhardt (New York: Urizen Books, 1978); Adorno, "The Curves of the Needle," "The Form of the Phonograph Record," and "Opera and the Long-Playing Record," trans. Thomas Levin, *October* (winter 1990): 49–66; and Thomas Levin, "For the Record: Adorno on Music in the Age of its Technological Reproducibility," *October* (winter 1990): 23–47. See also Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction" (1936), in *Illuminations* (New York: Harcourt Brace and Jovanovich, 1968).

4. Miles Orvell, *The Real Thing: Imitation and Authenticity in American Culture, 1880–1940* (Chapel Hill: University of North Carolina Press, 1989), 36.

5. Orvell, xv.

6. An example of the distinction (taken from Orvell) would be the "realism" of the literary representations of Frank Norris in contrast to the "reality itself" of the telegraphic headlines, ad copy, and miscellaneous bits of floating text utilized by John Dos Passos.

7. Orvell, xv.

8. The employment of acoustical technology by modern avant-garde artists is explored in Douglas Kahn and Gregory Whitehead, eds., *Wireless Imagination: Sound, Radio, and the Avant-Garde* (Cambridge, Mass.: MIT Press, 1992). The development of sound film c. 1928 instituted the beginnings of acoustical cutting, dubbing, mixing, and other sorts of special techniques. For many years after the initiation of these techniques, however, much of this creative flexibility was used to create traditional-sounding musical recordings. Multiple takes were spliced to create a performance more real (i.e., more flawless) than could actually be created by live musicians in a single take, but otherwise the music was not fundamentally changed.

9. See K. Michael Hays, *Modernism and the Posthumanist Subject: The Architecture of Hannes Meyer and Ludwig Hilberseimer* (Cambridge, Mass.: MIT Press, 1992), 64–65.

10. "If you set a blank record revolving to receive all the sounds, and a film-camera going to photograph all the motions of a scattered group of individuals . . . you more or less get Mr. Dos Passos's method." Quoted in Orvell, 259.

11. T. J. Jackson Lears, *No Place of Grace: Antimodernism and the Transformation of American Culture, 1880–1920* (New York: Pantheon Books, 1981); "From Salvation to Self-Realization: Advertising and the Therapeutic Roots of the Consumer Culture, 1880–1930," in *The Culture of Consumption: Critical Essays in American History, 1880–1980,* ed. Lears and Richard Wightman Fox (New York: Pantheon Books, 1983); and "Beyond Veblen: Rethinking Consumer Culture in America," in *Consuming Visions: Accumulation and Display of Goods in America, 1880–1920,* ed. Simon Bronner (New York: W. W. Norton, 1989). See also Lears, *Fables of Abundance: A Cultural History of Advertising in America* (New York: Basic Books, 1994).

12. Orvell, xxii.

13. Lizabeth Cohen, "Encountering Mass Culture at the Grassroots: The Experience of Chicago Workers in the 1920s," *American Quarterly* 41 (Mar. 1989): 6–33, and *Making a New Deal: Industrial Workers in Chicago, 1919–1939* (New York: Cambridge University Press, 1990).

14. Thomas A. Edison, "The Perfected Phonograph," *North American Review* 146 (June 1888): 643. The quote is a reminiscence. For more on Edison's invention, see Edward Jay Pershey, "Drawing as a Means to Inventing: Edison and the Invention of the Phonograph," in *Working at Inventing: Thomas A. Edison and the Menlo Park Experience,* ed. William Pretzer (Dearborn, Mich.: Henry Ford Museum and Greenfield Village, 1989) and Robert Rosenberg, "How the Phonograph Emerged in a Telegraph Lab Working on Telephones" (paper delivered at the Toronto History of Science Society Meeting on the History of Laboratories and Laboratory Science, 28 July 1992; I thank Robert Rosenberg for sharing a copy of his paper with me). Leonard DeGraaf, a graduate student at Rutgers, is currently working on a dissertation on the Edison phonograph. Standard texts on the history of the phonograph include Oliver Read and Walter Welch, *From Tin Foil to Stereo: Evolution of the Phonograph* (Indianapolis: Howard Sams, 1959), and Roland Gelatt, *The Fabulous Phonograph: From Edison to Stereo, 1877–1977* (New York: Macmillan, 1977). See Matthew Josephson, *Edison: A Biography* (New York: John Wiley and Sons, 1959), and Andre Millard, *Edison and the Business of Innovation* (Baltimore: Johns Hopkins University Press, 1990) for more on Edison and his businesses.

15. Quoted in Read and Welch, 16.

16. "The Phonograph," *Harper's Weekly* 22 (30 Mar. 1878): 249; Alfred M. Mayer, "On Edison's Talking-Machine," *Popular Science Monthly* 12 (Apr. 1878): 719; "The Phonograph," *Journal of Science* 15 (Apr. 1878): 251.

17. "Prepared for an elaborate system of weights, pulleys, levers, wheels, bands, . . . it was rather startling to find in the famous phonograph a simple apparatus, which, but for the absence of more than one cylinder, might have been a modern fluting machine." "The Phonograph," *Harper's Weekly* 22 (30 Mar. 1878): 249.

18. Thomas A. Edison, "The Phonograph and Its Future," *North American Review* 126 (May–June 1878): 533.

19. Edison, "The Phonograph and Its Future," 531.

20. "The Talking Phonograph," *Scientific American* n.s. 37 (22 Dec. 1877): 385.

21. Edward H. Johnson, "A Wonderful Invention," *Scientific American* n.s. 37 (17 Nov. 1877): 304.

22. "The Talking Phonograph," 384–385.

23. Edison, "The Phonograph and Its Future," 530.

24. Edison, "The Phonograph and Its Future," 529.

25. W. H. Preece, "The Phonograph," *Journal of the Society of Arts* 26 (10 May 1878): 537. In the original, the latter part of the quotation here, following the ellipsis, preceded the first part (before the ellipsis).

26. Edison, "The Phonograph and Its Future," 534.

27. "Edison's Perfected Phonograph," *Nature* 39 (29 Nov. 1888): 107.

28. Portability of phonograph recordings was a new feature of the 1888 machine. The earlier impressed-tin foil records were destroyed once removed from the supporting metal cylinder, but the new phonograph records, carved out of the surface of a rigid wax cylinder, could be removed, replaced, replayed, and rerecorded. This method was developed not by Edison but by Chichester Bell and Charles Sumner Tainter. These men, working for Bell's famous brother Alexander, received a patent for their engraving phonograph, the "graphophone," in 1886; see Read and Welch, chap. 3.

29. Proceedings of the 1890 Convention of Local Phonograph Companies, (Nashville: Country Music Foundation Press, 1974), and Read and Welch, chaps. 3 and 4. A phonograph for dictating would later successfully reappear.

30. Proceedings of the 1890 Convention, 163.

31. *New York Journal,* 9 Nov. 1890. Document file, Edison Archives.

32. The Edison company advertised recordings of Brand's Concert Band as possessing "specially fine quality of tone, loudness without overvibration, and distinctness of instrumentation." *Edison Phonographic News* 3 (July–August 1896). Primary Printed Collection (hereafter referred to as PPC), Edison Archives.

33. Advertising copy circa 1900. PPC, Edison Archives.

34. "The Manufacture of Edison Phonographic Records," *Scientific American* 83 (22 Dec. 1900): 390.

35. Carol Neuls-Bates, ed., *Women in Music: An Anthology of Source Readings from the Middle Ages to the Present* (New York: Harper and Row, 1982); Judith Tick, "Passed Away Is the Piano Girl: Changes in American Musical Life, 1870–1900," in *Women Making Music: The Western Art Tradition*, ed. Jane Bowers and Judith Tick (Urbana: University of Illinois Press, 1986); Cyril Ehrlich, *The Piano: A History* (Oxford: Oxford University Press, 1990); and Craig Roell, *The Piano in America, 1890–1940* (Chapel Hill: University of North Carolina Press, 1989).

36. Joseph Mussulman, *Music in the Cultured Generation: A Social History of Music in America, 1870–1900* (Evanston: Northwestern University Press, 1971); Philip Hart, *Orpheus in the New World: The Symphony Orchestra as an American Cultural Institution* (New York: Norton, 1975); Ronald Davis, *A History of Music in American Life* (Malabar, Fla.: Robert Krieger, 1980–82), 3 vols.; and Lawrence Levine, *Highbrow/Lowbrow: The Emergence of Cultural Hierarchy in America* (Cambridge, Mass.: Harvard University Press, 1988).

37. "The Decline of the Amateur," *Atlantic Monthly* 73 (June 1894): 859.

38. Jane Addams, "The Snare of Preparation," in *Twenty Years at Hull House* (1910; repr. New York: Penguin, 1981), 65.

39. Edward Bellamy, *Looking Backward* (1888; repr. New York: Penguin, 1984), 97.

40. John Philip Sousa, "The Menace of Mechanical Music," *Appleton's* 8 (Sept. 1906): 278, 281.

41. *New York Morning Telegraph*, 12 June 1906. Sousa, quoted in Neil Harris, "John Philip Sousa and the Culture of Reassurance," in *Perspectives on John Philip Sousa*, ed. Jon Newsom (Washington, D.C.: Library of Congress, 1983), 39 n. 102. The reference to "pirated" music is based on Sousa's belief that faulty copyright laws allowed the phonographic record industry to deprive composers like himself of justly deserved royalties. See Sousa, "The Menace of Mechanical Music," for more on this complaint.

42. Harris, 39 n. 102.

43. For example, a story by O. Henry describing two Americans who took a phonograph to South America referred to the machine as a "musical corn sheller" and said of the indigenous people to whom the machine was demonstrated: "[P]rogress has never condemned them to accept the work of a can opener as an overture." "The Phonograph and the Graft," *McClure's* 20 (Feb. 1903): 432, 430.

44. "The Menace of Mechanical Music: Some of the Replies Evoked by Mr. Sousa's Article," *Appleton's* 8 (Nov. 1906): 639.

45. James Huneker, *Overtones* (1904), 286; quoted in Tick, "Passed Away Is the Piano Girl," 325.

46. "Unexpected visitors, neighbors, or your children can be most acceptably and economically entertained in this manner." Advertising copy dated 26 Dec. 1905. Document file, Edison Archives.

47. *Saturday Evening Post*, 12 Nov. 1910.

48. A. Lillingston, "The Talking Machine," *Littel's Living Age* 254 (24 Aug. 1907): 488. This quest for "quality of tone" might also fill the place that music making

had previously held for those amateurs who no longer felt qualified to make music themselves. In 1917, Mrs. Alice G. Falby, of Denver, Colorado, offered the following testimonial to the Edison Company: "Loving music, but with no faculty of expression, I became greatly interested in its reproduction by mechanical means." *Along Broadway,* Feb. 1917. Edison Archives.

49. Player piano manufacturers also had to deal with the implications of introducing "machine-made" musical reproductions into the home. Since the machine was, superficially, the piano itself, their task was less extensive than that faced by phonograph manufacturers. Still, player piano advertisements emphasized the control that the user had over the performance: "[S]eated here with the pneumatic expression controls at your finger-tips, you know the thrill of playing the music you like best in the way *you* wish to play it. The Artronome puts the technical skill of the artist at your command; it is you who provide the interpretation." Straube player piano advertisement, *Saturday Evening Post,* 1923; reproduced in Roell, 112.

50. *Edison Phonographic News* (Mar.–Apr. 1895): 90. PPC, Edison Archives.

51. Allan L. Benson, "Edison's Dream of New Music," *Cosmopolitan* 54 (May 1913): 799.

52. The commercial disc gramophone, developed by Emile Berliner, first appeared in 1895. Within a few years, "sales of Gramophones and records were zooming." Read and Welch, 128. For more on the complicated story of how Berliner's invention evolved circa 1900 into the Victor Talking Machine Company, see Read and Welch, chap. 10, and Fred Gaisberg, *The Music Goes Round* (New York: Macmillan, 1943). For more on the Diamond Disc, see George L. Frow, *The Edison Disc Phonographs and the Diamond Discs: A History with Illustrations* (Salterns, Kent, Great Britain: George L. Frow, 1982), and Read and Welch, chap. 14.

53. The advantages and disadvantages of each format are well outlined in Read and Welch, chap. 12.

54. *Edison Phonograph Monthly* 10 (May 1914): 59, Edison Archives. The concert took place in Woodstock, Vermont.

55. A. M. Kennedy to Reese, 10 Apr. 1915. Document file, Edison Archives.

56. *Edison Retail Sales Laboratory* (1915): 29. PPC, Edison Archives.

57. "Improving the Reproduction of Talking-machine Records," *Scientific American* 109 (27 Sept. 1913): 247.

58. Some early cabinet designs even attempted to make the phonograph look like a small grand piano. Frow, chap. 3 and illustrations on p. 29.

59. Phonographs in this price range were affordable only to middle-class or wealthier families, and in most cases they would be bought "on time," through monthly installments, in the same way that pianos and other costly musical instruments were often financed. A phonograph of lesser quality could be had for around $25, and this was the type of machine found in millions of working-class homes. Records cost anywhere from fifteen cents to several dollars apiece.

60. Sonora ad, *New York Tribune,* 30 Apr. 1916.

61. Quoted in Frow, 135. It is not evident that any of the $6,000 models were actually sold. By 1917, thirty of the $1,000–$2,000 models had been shipped to customers. Frow, 134.

62. Quoted in Frow, 51. The Diamond Disc phonograph became known as the "Official Laboratory Model" in 1916, when it became clear that associating the commercially available machines with Edison's own "research tool" would attract sales. Frow, ix.

63. "Edison" booklet (1917). PPC, Edison Archives. Perhaps for similar reasons, in 1916 the Victor Company transformed its tungsten stylus into one made of "Tungstone." Victor ad, *New York Evening Mail,* 1 May 1916, 2.

64. Edward Buckley to Mr. Maxwell, circa 1918. Document file, Edison Archives.

65. *Scientific American* 119 (31 Aug. 1918): inside front cover.

66. "Art of Reproducing Sound," post–Diamond Disc pamphlet (circa 1915) produced by Silverstone Music Company. PPC, Edison Archives.

67. The public educated themselves well enough to complain rather loudly when they felt the new standard was not being met: "For God's sake send some perfect stuff, you have done it in the past and it is up to you to do so again . . . We are a very critical audience and it is a well known fact that what will pass in Manchester in the way of music and opera will go through the world unscathed. . . . Your machines are the acme of perfection and why cannot records be in unison." Manchester Edison Society to Thomas Edison, 10 Aug. 1915. Document file, Edison Archives. Such consumer complaints even occasionally led the Edison company to remake certain records, recalling the artist to the studio to re-record the number, in order to generate a more satisfactory result. In 1916, a recording of "Wacht am Rhein" was remade because there were "complaints of this record now on the market as being harsh, too loud and sharp." W. H. Miller to Hayse and Moss, 23 June 1916. Document file, Edison Archives.

68. William Maxwell, *Edison Retail Sales Laboratory* (1915): 18. PPC, Edison Archives.

69. J. P. Constable to Maxwell, 22 Nov. 1917. Document file, Edison Archives.

70. Tone Test Local Contract for Prescott, Arizona, 8 Dec. 1921. Phonograph Division Records (hereafter referred to as PDR), Edison Archives.

71. The suggested arrangement sought to recreate a domestic parlor on stage, with rugs, lamps, furniture and "the best framed picture of Mr. Edison you can produce." In keeping with the re-creational spirit of the event, the author suggested employing "mahogany pedestals bearing imitation marble busts of composers (or the real thing if available)," *Edison Diamond Points* (Nov. 1920): 15. A "grand piano (mahogany) if possible" was also suggested, and some tone tests did include live vocal performance with live piano accompaniment. The financial report for a 1920 tone test in San Francisco included $10.00 for an accompanist. Document file, Edison Archives.

72. F. W., "Voices vs. Records," *Boston Evening Transcript,* 19 Nov. 1915, 18.

73. "Re-Creation of Music by the Phonograph" *New York Evening Mail,* 2 May 1916, 8.

74. "Records Vie with Singers in Own Songs," *Pittsburgh Post,* 1 Oct. 1919, 5.

75. (?) to H. H. Blish, 12 Feb. 1920. Document file, Edison Archives.

76. Walsh to Maxwell, 4 Aug. 1920, and Maxwell to Walsh, 13 Aug. 1920. Document file, Edison Archives; Frow, 238.

77. Edison ad, *Cosmopolitan* (January 1917): 85; Scrapbook, vault 12, cabinet 402, shelf 1, Edison Archives.

78. Walsh to Maxwell, 4 Aug. 1920, refers to "25 sets of lesser artists," with Marie Rappold available for "special recitals." Document file, Edison Archives.

79. Data from a portion of the 1921 Helen Clarke—Joseph Phillips—Thomas George tone test tour (Document file, Edison Archives.):

Date	Town		Attendance
20 Sept.	Stanwood	Wash.	900
21 Sept.	Seattle	Wash.	2000
24 Sept.	Everett	Wash.	1200
26 Sept.	Montesano	Wash.	600
27 Sept.	Tacoma	Wash.	1350
28 Sept.	Portland	Ore.	700
29 Sept.	Walla Walla	Wash.	1300
30 Sept.	Colfax	Wash.	700

80. O. A. Lovejoy to Walsh, 17 Nov. 1921. PDR, Edison Archives.

81. W. H. Miller to Edison, 9 May 1916. Document file, Edison Archives.

82. W. H. Miller to Edison, 12 Jan. 1917. Document file, Edison Archives. While the women's appearances were a factor in determining who would make a successful tone test artist, evidence suggests that the phonographs themselves were the true objects of sexual appeal. Follow-up newspaper advertisements for the Clark and Phillips tone tests reported that "Helen Clark stood on the stage next to a shapely Chippendale cabinet," and the tone of the recorded sound was described by a reviewer as "round and luscious." *Stanwood [Washington] News,* 23 Sept. 1921, 3, 1. The reference to "shake" has to do with the fact that Thomas Edison required all his artists to perform without vibrato or tremolo effects.

83. Telegram to Walsh from Sokoloff. Document file, Edison Archives.

84. *Edison Diamond Points* (Aug. 1918): 15. Edison Archives.

85. "A Little Journey through the Edison Shop," pamphlet, post 1921. PPC, Edison Archives.

86. Program, Christine Miller tone test, Symphony Hall, Boston, 18 Nov. 1915. Boston Symphony Orchestra Archives. "Miss Christine Miller Triumphs with Edison Phonographic Double," *Des Moines Times,* 27 Oct. 1915. Clipping book, Edison Archives.

87. Victor advertisement, *National Geographic,* Nov.–Dec. 1917.

88. In 1920 William Maxwell played a number of Edison recordings to conductor Walter Damrosch, and he summarized Damrosch's responses to the records in a memo sent to Thomas Edison. Edison responded: "Don't want to have much to do with the well know leaders they are absolutely void of all knowledge of the technique of their instruments or the laws of sound and so d____d opinionated by music and differ so much with each other that I think I can paddle my own canoe and future results will show." Maxwell to Edison (with response), 28 Sept. 1920. Document file, Edison

Archives. Edison's strong personal role in defining almost every element of the musical output of the Edison company is more intriguing for the fact that, as a result of a bout in childhood with scarlet fever, he was quite deaf. He often listened to recordings by biting into the wooden case of a phonograph, to conduct the sound directly to the bones of his inner ear. Edison himself saw his deafness as an advantage: "I can hear splendidly through my skull and through my teeth. The sound-waves then come almost direct to my brain. They pass through only my inner ear. And I have a wonderfully sensitive inner ear. I do not know that, in the beginning, it was any more sensitive than anybody else's but for more than fifty years it has been wrapped in almost complete silence. It has been protected from the millions of noises that dim the hearing of ears that hear everything." Allan L. Benson, "Edison's Dream of New Music," *Cosmopolitan* 54 (May 1913): 798. For Edison's deafness, see Josephson, 30–33. A photograph of Edison's own phonograph, clearly showing teeth marks in the wooden case, is reproduced in Frow, 21.

89. Case joined the ranks of the Metropolitan Opera in 1909, premiering as a page in *Lohengrin*. She was distinctive for the fact that she was the only American-born, American-trained member of the company at that time, and much was made of her "home-grown" talent in Edison company advertising. Her career peaked in 1913 when she sang the role of Sophie in the American premier of Richard Strauss's *Der Rosenkavalier*. She retired from the Metropolitan in 1916 and devoted herself thereafter to recital work. Biographical details come from the clipping file on Case at the New York Public Library for the Performing Arts, Music Division. See also John Harvith and Susan Edwards Harvith, eds., *Edison, Musicians and the Phonograph: A Century in Retrospect* (New York: Greenwood Press, 1987), 41.

90. For example, Sergei Rachmaninoff made ten recordings with Edison in 1920, before moving to Victor (Edison recording artist Ernest Stevens later recalled that Edison had told the pianist that he was just "a pounder." Harvith and Harvith, 26). A subsequent concert tour by Rachmaninoff was accompanied by Edison advertisements inviting concertgoers to listen to the Diamond Disc re-creations at an Edison dealer and compare them to their concert experience as well as to the pianist's "talking machine" (Victor) records. Sales Promotion Department to R. S. Williams and Sons Co. Ltd., 28 Oct. 1920. PDR, Edison Archives. See also Harvith and Harvith, 9.

91. "Voice vs. Records," *Boston Evening Transcript*, 19 Nov. 1915, 18.

92. "Voice vs. Records," 18.

93. *New York Evening Telegraph*, 11 Mar. 1920.

94. In a 1972 interview Case described how, in her Carnegie Hall tone test, she deliberately mimicked the sound of her recorded voice: "I remember I stood right beside the machine. The audience was there, and there was nobody on stage with me. The machine played and I sang with it. Of course, if I had sung loud, it would have been louder than the machine, but I gave my voice the same quality as the machine so they couldn't tell." Harvith and Harvith, 44.

95. "Voice vs. Records," 18.

96. "Edison Snares Soul of Music," 3.

97. *New York Evening Telegraph*, 11 Mar. 1920.

98. "Miss Christine Miller Triumphs with Edison Phonographic Double," *Des Moines Times,* 27 Oct. 1915. Clipping book, Edison Archives.

99. "Phonographic Reproduction Rivals Voices of Singers," *Pittsburgh Gazette Times,* 1 Oct. 1919, 5; "Miracle Songs Create Furore," *Pittsburgh Dispatch,* 1 Oct. 1919, 4.

100. See "Records Vie with Singers in Own Songs," *Pittsburgh Post,* 1 Oct. 1919, 5; and "Recital Is Enjoyed by Music Lovers," *Stanwood News,* 23 Sept. 1921, 1.

101. The same article later referred to "the instrument (or instruments) of Thomas George." "Recital Is Enjoyed by Music Lovers," 1.

102. "Concert Pleases Lovers of Music," *Walla Walla [Washington] Union,* 30 Sept. 1921, 1.

103. "Machine Imitates Nature," *Montesano [Washington] Videttte,* 30 Sept. 1921, 1.

104. *Peoria Star,* 19 Apr. 1916. Clipping book, Edison Archives.

105. R. S. Williams and Sons Co. Ltd., Toronto, to Thomas A. Edison Inc., 18 July 1922. Document file, Edison Archives.

106. Tone tests themselves could even be brought into the home, as is evidenced by the business card of Julia Cottet of Alhambra, Calif., who advertised, "Engagements accepted for entertaining in ensemble work with Edison Re-Creations, an artistic novelty" (c. 1921). Document file, Edison Archives.

107. *Walla Walla Union,* 30 Sept. 1921. Similar local advertisements from different towns claimed: "Proved! . . . to Seattle!" "Proved! . . . to Stanwood!" "Proved! . . . to Everett!"

108. In their encyclopedic account of the history of the phonograph, Oliver Read and Walter Welch clearly present the Edison Diamond Disc as a high-water mark of achievement. To them it was not just the best in its own time, but its quality of reproduction surpassed that of many of the electric machines that immediately followed. There is a melancholic tone to their account of the electrification of the phonograph. Read and Welch, chaps. 14–18.

109. *New York Tribune,* 28 Apr. 1916.

110. Orvell, xv.

111. O. A. Lovejoy to Arthur Walsh, 17 Nov. 1921; M. Goldberg, Silverstone Music Store, St. Louis, Mo., to Arthur Walsh, 8 Jan. 1921. PDR, Edison Archives.

112. Alice Verlet to Arthur Walsh, 18 Oct. 1926. PDR, Edison Archives.

113. A. L. Walsh to Alice Verlet, 2 Nov. 1926. PDR, Edison Archives.

114. Reproduced in Frow, 91.

115. Phonograph companies began offering their products in cabinets that included space for a radio. In 1929 the Victor Talking Machine Company merged with the Radio Corporation of America to form RCA Victor.

116. Read and Welch, 239. In 1926 the Edison Company addressed what it called "the volume fad" and produced a "Dance Reproducer," an accessory that could be installed to increase the volume of music produced by the Edison phonograph. Frow, 70–71.

117. The initial commercial products incorporating the new technology, the Victor Orthophonic Phonograph and the Columbia Viva-Tonal Phonograph, were actually mechanical phonographs that played electrically recorded records. The first commercial electrical home phonograph was the Brunswick Panatrope. Read and Welch, 268.

118. Victor ad, *McCall's Magazine,* Sept. 1927, 3; emphasis in original.

119. Even participants in high-end audio culture, an elite culture obsessively dedicated to the pursuit of sonic perfection at any cost, now measure component performance and quality through charts of frequency response and comparisons with reference equipment rather than with live performance. Joseph O'Connell, "The Fine-Tuning of a Golden Ear: High-End Audio and the Evolutionary Model of Technology," *Technology and Culture* 33 (Jan. 1992): 1–37.