

Fidelity to What?
Negotiating the Uneasy Relationship
Between Sound Recording and Classical Music Culture

by

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Abstract

The idea of “fidelity” has been a fundamental preoccupation in sound recording and is central to discourse on recordings practices for Western classical music. There are several possible sites of authenticity to which a classical music recording might be faithful: to the sound of the live performance, to the composer’s intentions as represented on the score, to historical sounds and practices, or to the artistic vision of the performer. This thesis discusses various notions of fidelity that inform the discourse around making and listening to classical music recordings. I contend that neither the technology nor the recording process can be impartial, that perceived fidelity is not a function of the amount of technical intervention and manipulation, and that the goal is not to fully reproduce an original musical event, but to create a stylized listening experience.

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Chapter One: Introduction

“Fidelity”—as sonic accuracy or faithful reproduction of an original event—has been a fundamental preoccupation in sound recording. The pursuit of fidelity in sound recording has been closely tied to recording Western classical music because fidelity to aspects of live performance and the concert hall experience have consistently been an objective of recordings in this genre. A recent article on the CBC’s website maintains that “the classical industry is bound to remain a bit backward, recording-wise, because its emphasis continues to remain on concert-style execution.”¹ As Colin Symes writes,

[In] classical music circles [...] they never threw out the idea that the concert was the ultimate articulation of music and that the phonograph should defer to it. Modes of representing classical music on disc that have abandoned this concert benchmark have tended, with rare exception, to be marginalized.”²

For this reason, in classical music culture, sound recording technology has often been understood as a mediator that simply translates live sounds to the recorded medium. This is different from other genres, pop music in particular, which quickly adopted sound recording technology as both a compositional tool and a way of representing live performance. When sound recording technology is understood as a mediator of live sounds, fidelity to an (assumed) external reality offers a gold standard.³ The ideal mediator would be transparent and would faithfully transcribe the original event without intruding on the performance or coloring the recorded sound. From this standpoint, there is a tendency to equate less technical intervention with more direct and authentic

¹ John Keillor, “An Appreciation of Glenn Gould the Studio Engineer,” *CBC*, October 11, 2001, accessed March 16, 2011, <http://www.cbc.ca/arts/music/gouldstudio.html>

² Colin Symes, *Setting the Record Straight: A Material History of Classical Music Recording* (Middletown, CT: Wesleyan University Press, 2004), 7

³ Jonathan Sterne, *The Audible Past: Cultural Origins of Sound Reproduction* (Durham: Duke University Press, 2003), 284

communication. Indeed, this belief informs much of the discourse on recording classical music. There is a notion that techniques which mimic the human hearing system create more realistic-sounding recordings (e.g., stereo pair microphone techniques), and that such technologies are less intrusive and more transparent than those associated with popular music recordings (e.g., multi-microphone and multitrack recording, editing, and signal processing techniques). Many classical music sound engineers and producers tout minimal miking and processing as the ideal way to record this music, even if they do not adhere to this approach in practice. While live performance serves as a conceptual and aesthetic reference point for a recording, there are aspects of live performance that are undesirable, such as incorrect notes, extraneous noises, and the balance of direct to reverberant sound. It is clear that accurately representing all aspects of a performance is not the ultimate goal.

The issue of fidelity in recording classical music is complicated further by other notions of authenticity in the classical music tradition, such as the authority of the score, respect for the intentions of the composer, historically informed notions about performance practice and authentic sounds, and in some cases, the personal interpretation of virtuoso performers. Sound recording technology often makes it possible to realize a performance with greater fidelity to the composer's intentions, to the vision of the performer, and to historical sounds and practices than would be achievable live. Although sound recordings have become an important part of classical music culture, live performance is still granted privileged status. Classical conservatories train musicians to perform live, for example, not to be recording artists.

Because the architectural acoustics of performance spaces have been influential in the composition and performance of classical music, faithful representation of acoustic space on recordings is another element that sound engineers and producers have had to consider. Spatial acoustics have been represented differently according to technological and cultural circumstances. There has nonetheless been steady progression toward refining a perspective that transports the listener out of the listening environment and into the space of the performers. The illusion of space is, in part, a function of the amount of direct to reverberant sound. The most recent generation of commercial reverb systems uses the process of convolution, which involves the digital sampling and simulation of real spaces.⁴ The *Virtual Haydn* project—a recent Juno-nominated research and recording project from McGill University—employs convolution reverb in order to re-create the physical spaces where Haydn’s solo keyboard music may originally have been performed.⁵ While the sampled acoustics are only digital simulations (i.e., the recordings were not done in the actual spaces), this project proposes yet another locus of authenticity for classical music recording: fidelity to the spatial acoustics of an original or historically-relevant performance space.

This thesis is part of an emerging field that Stephen Cottrell calls ‘phonomusicology’ or the study of recorded sound.⁶ It adds specifically to the growing

⁴ Digital reverberation employing convolution is not new. It was suggested as early as 1979. See J. A. Moorer, “About this reverberation business,” *Computer Music Journal* Vol. 3 No. 2 (1979) 13–28. Commercial reverbs using this process have been available since 2001 (the first real-time direct convolution reverb product was the Altiverb 1.0 software plug-in).

⁵ *The Virtual Haydn: Complete Works for Solo Keyboard*, Naxos Blu-Ray Audio, catalogue number NBD0001-04.

⁶ Stephen Cottrell, “The Rise and Rise of Phonomusicology,” *Recorded Music: Performance, Culture, and Technology*, ed. Amanda Bailey (Cambridge: Cambridge University Press, 2009), 15–36. Cottrell coined the term “phonomusicology” much earlier, in a paper titled “From Wax Cylinders to Waxing Lyrical Ethnomusicology or Phonomusicology?” presented to the Society for Ethnomusicology in Atlanta, Georgia, 2005.

literature on the negotiation of sound recording technology in classical music culture. Interest in the scholarly study of recording arts is relatively recent, and while there has been an increase in scholarly attention to the impact of sound recording in popular music, there has been less literature interested specifically in dealing with these issues in classical music. It is perhaps surprising that classical music has not been forefront in scholarly discussions of sound recording, given that it has been the testing ground for so many revolutionary developments in recording technology. This fact seems to be overlooked by the record production community as well: “Tonmeisters, composers, and producers of classical and acoustic music have often lead the way in terms of technical progression [...] a fact largely erased from the collective consciousness of the music production community.”⁷ ⁸ Classical music engineers have been quick to adopt and advocate for new audio formats such as magnetic tape, LPs (long-playing records), and digital media, in order to meet the demands of the music.⁹ Classical music was also central to the cult of high fidelity that developed in the 1950s.¹⁰

To date, discussion about sound recording and classical music culture have been limited to a chapter here and there, or touched upon peripherally in longer discussions on the impact of recording in popular music. Mark Katz’ two chapters on the effects of recording on classical music performance, and Peter Doyle’s chapter on the meaning of

⁷ Kent Walker, “Breaking Through the Glass Communication Scenes in Music Production” (paper presented at the Art of Record Production Annual Conference, Edinburgh, Scotland, September 8–10, 2006)

⁸ *Tonmeister* translates literally from German as “sound master.” A *Tonmeister* is a particular kind of sound engineer and producer who is expected to have equal training in music and in sound recording

⁹ For instance, the length of classical works such as Wagner’s *Ring* cycle necessitated the development of formats capable of storing long performances

¹⁰ David Morton, *Off the Record: The Technology and Culture of Sound Recording in America* (Piscataway, NJ: Rutgers University Press, 2000), 15

reverb in classical music culture, are typical in this respect.¹¹ More recently, however, several chapters addressing issues specific to classical music recording can be found in the *Cambridge Companion to Recorded Music*, and *Recorded Music: Performance, Culture, and Technology*.¹² And Arved Ashby's latest book *Absolute Music, Mechanical Reproduction* focuses exclusively on Western art music, as does Colin Symes' work on the discourse and material documents that accompany classical music recordings.¹³

Because the scholarly study of recording arts is a relatively new field, the research presented here requires considerable recourse to primary and journalistic sources. Furthermore, because it is a niche genre within the commercial recording industry, information on the process and personnel behind classical music recordings is scant compared to the abundance of such literature on popular music genres. Therefore, I draw heavily on record reviews, interviews and articles in popular audio magazines such as *Gramophone*, *Stereophile*, and *Mix*, for information on how recordings are being publicly received and critiqued, and how engineers and producers describe their practice. I look primarily to the *Journal of the Audio Engineering Society* for technical papers on sound engineering and audio technologies, as well as to other well-known recording manuals such as Streicher and Everest's *The New Stereo Soundbook*.¹⁴

¹¹ Mark Katz, *Capturing Sound How Technology Has Changed Music* (Berkeley: University of California Press, 2004), Peter Doyle, *Echo & Reverb Fabricating Space in Popular Music Recording, 1900–1960* (Middletown, CT: Wesleyan University Press, 2005)

¹² Nicholas Cook, Eric Clark, and Daniel Leech-Wilkinson, eds. *The Cambridge Companion to Recorded Music* (Cambridge: Cambridge University Press, 2009), Amanda Bailey, ed. *Recorded Music Performance, Culture, and Technology* (Cambridge: Cambridge University Press, 2009)

¹³ Arved Ashby, *Absolute Music, Mechanical Reproduction* (Berkeley and Los Angeles: University of California Press, 2010), Colin Symes, *Setting the Record Straight A Material History of Classical Music Recording* (Middletown, CT: Wesleyan University Press, 2004)

¹⁴ Ron Streicher and F. Alton Everest, *The New Stereo Soundbook*, 2nd ed. (Pasadena, CA: Audio Engineering Associates, 1998). See also David Miles Huber and Robert E. Runstein, *Modern Recording Techniques*, 6th ed. (Boston: Focal Press, 2005)

By necessity, this study weaves together a variety of scholarly and non-scholarly sources. Critically assessing the (often conflicting) perspectives of disparate sources has been one of the foremost challenges in conducting this study. To my mind, there is definitely a sense in which technical knowledge about sound recording and some degree of studio experience is necessary to conduct scholarly research in this area, or at least greatly facilitates such work. Perhaps this echoes a recurrent question in the musicological community about the importance of musical performance to musicological research. Having a basic knowledge of the technical aspects of sound recording might be akin to learning the basics of music theory, and studio experience akin to learning to play an instrument.

Chapters Two and Three of this thesis address technical aspects and conceptions of fidelity. Chapter Two also describes the limitations of current technologies to reproduce sound sources and their environs, and discusses the privileging of live performance. Chapter Three outlines conventional approaches to recording classical music, the role of the sound engineer and producer, and discrepancies between the discourse and practice of sound recording. Drawing on Peter Kivy's work, Chapter Four identifies sites of authenticity in the classical music tradition and describes the effect of sound recording on classical music performance.¹⁵ Chapter Five looks at broad trends in representing acoustic space on recordings, and uses McGill's *Virtual Haydn* project to illustrate a recent intersection of technology and notions of authenticity in classical music culture.

¹⁵Peter Kivy, *Authenticities: Philosophical Reflections on Musical Performance* (Ithaca, NY: Cornell University Press, 1997)

Chapter Two: Technical Fidelity, the Live, and the Mediatized

Sound Recording Through a Philosophy of Mediation

Live performance is still widely considered to be the most authentic expression of the classical music repertoire, therefore fidelity to the sound of a live performance—usually to the concert hall experience—is a basic preoccupation in classical music recording. It is common to think of sound recording as the mediation of “live” sound where the live event is considered “the original” and the recording “the copy.” As Jonathan Sterne writes, “conventional accounts of sound fidelity often invite us to think of reproduced sound as a mediation of ‘live’ sounds, such as face-to-face speech or musical performance, either extending or debasing them in the process.”¹⁶ Sterne refers to this conception of sound recording as a “philosophy of mediation.” From this perspective, so-called fidelity to an external reality (the “original”) becomes the gold standard. A sound recording inevitably fails to fully reproduce the original event because an actual three-dimensional reproduction is not possible with the current technology, and the concept of perfect fidelity is, as Sterne puts it, a “philosophical quagmire.”¹⁷ It is common to think of classical music recordings through a philosophy of mediation because the intent of most of these recordings is to recreate the sound of a live performance without drawing attention to the way the performance is mediated through the technology.

Through a philosophy of mediation, the recording media should ideally be transparent, and thus neutral. As Arved Ashby points out, supposed impartiality is what

¹⁶ Sterne, *The Audible Past*, 218.

¹⁷ *Ibid.*, 122.

gives power to recording technology such as the microphone and the camera, because it promises to deliver a value-free documentation of reality; it promises to tell the truth:

The microphone and the camera, as part of their peculiar implicit form of ethics-politics, feign impartiality when in truth they remake reality in their own image: their power lies in the ostensible transparency of purpose under which they point the onlooker to *this* image in *this* way and at *this* time.¹⁸

For recordings that supposedly aim to translate the sound of a live performance to the recorded medium as faithfully as possible—which is the case with most classical music recordings—the technology should be a “transparent” and impartial mediator. In this chapter I argue that, despite the effort to render the technology transparent, the use of soundrecording technology in the domain of classical music *cannot* be neutral or impartial, for two reasons. First, technology cannot truly capture and reproduce sound three-dimensionally; therefore, as we will see, a sound recording can only give the illusion of an original event. Second, performances are seldom unaffected by the recording process; therefore, whether one can legitimately claim that performances heard on a recording ever existed at all as “original” events is questionable.¹⁹

Technical Fidelity: Can We Reproduce the Original?

While it may be difficult to quantify a recording’s faithfulness to the “reality” of an original event, the basic physical measures of sound recording equipment (such as frequency response, dynamic range, signal-to-noise ratio, and total harmonic distortion) are well defined.²⁰ There has been a general improvement in the technical performance of

¹⁸ Arved Ashby, *Absolute Music, Mechanical Reproduction*, 194

¹⁹ An archival recording of a live concert or a direct-to-disk studio recording could arguably be considered exceptions

²⁰ For technical definitions of such measures see Bob Metzler, *Audio Measurement Handbook* (Beaverton, Oregon: Audio Precision, 1993)

audio devices throughout the history of sound recording. I will refer to the progress in the physical capability to record and playback sound as “technical fidelity,” in order to discriminate between measured technical improvements and other notions of fidelity. Frances Rumsey, a well-known audio researcher and educator, summarizes improvement in technical fidelity:

Reproduced sound quality, in the sense that most people understand it, has improved dramatically in the past forty years. From relatively modest signal-to-noise ratio, distortion performance and frequency response we have arrived at a point where these things are simply not a problematic issue for most people. The *technical* quality of sound recording systems can now be made arguably as good as it needs to be to capture the dynamic and frequency ranges that we can perceive.²¹

Although technical fidelity contributes to the faithful reproduction of a live performance, arguably an important cue that the performance on a recording could have happened live is the plausible representation of spatial acoustics, which continues to be a challenge for sound engineering:

The importance of the spatial aspects of sound have been clear since before the dawn of audio reproduction, as evidenced, for example, in the design of concert halls. So it is not surprising that concern for the accurate capture, transmission, and reproduction of the spatial components of a sound event goes back almost to the birth of the audio industry as we know it today. Yet, even now, completely accurate spatial reproduction remains elusive, and is perhaps the largest single imperfection in modern audio technology.²²

To map and reproduce all the behaviours of sound requires an approach to recording that is different from conventional recording techniques.²³ Research in spatial audio has pursued the creation of systems that allow listeners to be immersed in, and interact with, acoustic events. Such research concerns itself not only with the traditional components of technical fidelity, but with a kind of spatial fidelity, which aims to recreate the sound of

²¹ Frances Rumsey, *Spatial Audio* (Oxford: Focal Press, 2001), x.

²² Mark F. Davis, “History of Spatial Coding,” 554.

²³ *Ibid.*, 554.

sources and spaces. Stereophonic systems have the capacity to create the *illusion* of spatial sound events, although they do so for a very specific listening position—the so-called “sweet-spot,” where the listener is optimally centered between two or more speakers. Such systems are not interactive, in that listeners cannot move through spaces or around sound sources. Advancing beyond mere illusion of a three-dimensional sound event, especially outside the “sweet-spot,” is not possible with stereophonic technology. A similar problem is encountered in photography and motion pictures where technology is capable of producing images with perspective, or of simulating aspects of space, but actual three-dimensional representation does not occur (even with so-called 3D technology). One possibility for recreating acoustics in a way that is interactive and immersive (where listeners can move through recorded spaces and around sources) effectively involves hundreds or thousands of microphones placed around performers (to capture the dimensional projection of sound) and many loudspeakers surrounding listeners (to allow the experience of sound from all directions). This is a principle of Wave Field Synthesis, a technology that promises to move beyond the conventional stereophonic system.²⁴ Experiments conducted at Bell Laboratories in the 1930s investigated an early form of Wave Field Synthesis, but for practical reasons suggested three-channel systems (involving three microphones and three loudspeakers) for industrial applications, as they produced a sufficient spatial illusion in the sweet-spot.²⁵ The Bell Labs three-channel system became the basis for some cinema sound systems, and influenced the development of stereophony for music.²⁶ Sound recordings can only

²⁴ Wave Field Synthesis is discussed in more detail in Chapter Five. See also H. Wittek, “Perceptual Differences Between Wavefield Synthesis and Stereophony,” PhD diss., University of Surrey, 2007

²⁵ Rumsey, *Spatial Audio*, 10–11

²⁶ *Ibid.*, 11

exist as psychoacoustic illusions of objects and spaces, and representations of original events will necessarily be compromised.

Classical engineers have generally welcomed (and sometimes inspired) technical advances in sound recording. Simon Frith has noted that, “most developments in recording technique—long players, hi-fidelity, magnetic tape, stereophonic sound, digital recording, compact discs, etc—have, in fact, been pioneered by the classical divisions of record companies.”²⁷ For example, the classical label Telarc prides itself on having been the first to commercially release a digital recording of an orchestra, using Tom Stockham’s *Soundstream* digital recorder.²⁸ Moreover, before using Stockham’s digital recorder, Telarc engineer Jack Renner recalls asking Stockham if he would first make some technical improvements. In a *Stereophile* interview, Renner recalled, “There I was, somebody who’d issued two direct-to-disc recordings...and we were demanding of Tom Stockham...that he make his machine better.” Stockham agreed, and improved his system to 50kHz sampling rate and 4 digital audio tracks.²⁹

Classical engineers have been quick to adopt new recording formats due to the demands of the music. “The LP was originally conceived as a new medium for classical music,” David Moulton writes, “since many classical works or movements are twenty minutes or more in duration.”³⁰ A complete recording of Wagner’s *Ring* cycle (1959) was not attempted until it was possible to release it on stereo LP. By producer Culshaw’s

²⁷ Simon Frith, “Art Versus Technology: The Strange Case of Popular Music,” *Media, Culture and Society* 8 (1986): 271.

²⁸ Thomas Fine, “The Dawn of Commercial Digital Recording,” *Journal of the Association for Recorded Sound Collections*, Vol. 39, No.1 (2008), 7. The recording is of Gustav Holst’s two *Suites for Military Band* along with Handel’s *Music for the Royal Fireworks* and a transcription of Bach’s *Fantasia in G major* for band, and was recorded April 4-5, 1978 in Cleveland, Ohio. Telarc, catalogue number ASIN B000003CSE.

²⁹ *Ibid.*, 7.

³⁰ David Moulton, “Birth of the LP: Banquet Speaker Recalls Competition and Innovation,” *Audio Engineering Society Boston Section Newsletter* (September 1998): 1.

calculation, it would have taken one hundred and twelve 78 discs to hold the entire production, and the listener would have been interrupted thirty-five times.³¹ This can hardly be described as a “realistic” or immersive listening experience

What is the Original?

Fixating on how closely recordings match perceived original sound fields sometimes diverts attention away from a critically important question that this orientation presupposes. Namely, what precisely constitutes the “original?”³² An initial sound vibration sets in motion a chain of events: the vibration ripples outward changing the pressure in the surrounding air (or other medium), and these pressure waves are absorbed or bounced off surfaces until they eventually dissipate. There are arguably infinite perspectives from which to hear a sound, and no one perspective that is authoritatively ideal: “Sound is diffused irregularly around the listening arena and there is in fact no single, authorized listening position where the ‘correct’ sound is heard.”³³ Furthermore, since our experience of sound is necessarily filtered through our perceptual faculties, variation in internal representations of external sound objects may add another layer of subjectivity.³⁴ Given the limitations of the technology, classical music sound engineers and producers must choose a perspective from which to represent the musical event, and this requires a complex set of decisions.

³¹ John Culshaw, *Ring Resounding: The Recording in Stereo of Der Ring des Nibelungen* (London: Secker, 1967), 21

³² Sterne, *The Audible Past*, 219

³³ Peter Johnson, “Classical Audio Recording,” *Recorded Music: Performance, Culture, and Technology*, ed. Amanda Bayley (Cambridge: Cambridge University Press, 2009)

³⁴ See Albert S. Bregman, *Auditory Scene Analysis: The Perceptual Organization of Sound* (Cambridge, MA: MIT Press, 1990).

Sterne raises a different issue concerning originals and copies when he claims that originals are themselves artifacts of reproduction.³⁵ In most recording sessions, for example, some aspect of the performance is adjusted to meet the needs of the recording. For a classical recording, the sections of an orchestra may be re-arranged, separated by a physical barrier, and the instrumentation may be otherwise tailored to meet the technical needs of the recording. There may or may not be an audience present aside from the technical personnel. When a performance is changed to meet the needs of the recording, the “original” sounds can therefore be considered as much a product of the recording medium as the so-called copies. Reproduced sounds are thus not necessarily simply mediated versions of unmediated original sounds.³⁶ Sterne contends that recording technology does not mediate between the listener and the performer. Rather, for Sterne, recording technology *is* their connection:

The medium does not mediate the relation between singer and listener, original and copy. It *is* the nature of their connection. Without the medium there would be no connection, no copy, but also no original, or at least, no original in the same form. The performance is for the medium itself.³⁷

If sound recording is not merely “eavesdropping” on a live performance, then Sterne argues that we should more correctly consider all reproductions to be “studio art” rather than mediations of live sounds.³⁸

³⁵ Sterne, *The Audible Past*, 219

³⁶ *Ibid.*, 219.

³⁷ *Ibid.*, 226.

³⁸ *Ibid.*, 237.

Beyond an Impartial Mediator: “Realism” Versus “Romanticism” in Sound Recording

For many sound recording engineers, the measurable improvements in the physical capacity to record and playback sound are not ends in themselves. They tend to be in service of larger goals of not only faithfully translating but also “revealing” a musical performance through sound recording. Wieslaw Woszczyk insists that accuracy, acoustic detail, and a “transparent medium” work to reveal the “full immersive presence of music”:

In over a century of development of sound recording technology, the principal goal has been to find a method of representing performed music with the finest acoustic detail and perceived accuracy. The term ‘naturalness’ symbolizes a multitude of characteristics inherent in a recording that reveals the full immersive presence of music using a transparent medium. Such recording beams with musicality: detailed presentation of musical interactions between players, realism of place and time, sensation of being included in the original (or synthetic) acoustical space where music is performed.³⁹

For engineers who are interested in making realistic-sounding, immersive recordings, attention is currently focused on high-resolution and multi-channel (surround sound) formats.⁴⁰ There is disagreement in the audio community concerning the benefits offered by some of these technologies. For example, the perceptual benefit of systems that record and reproduce hypersonic frequencies (above 20 kHz) has been frequently questioned. However, proponents of high-resolution recording technology, such as Woszczyk, claim

³⁹ Wieslaw Woszczyk, “Physical and Perceptual Considerations for High-Resolution Audio,” *The Proceedings of the 115th convention of the Audio Engineering Society*, New York, October 10–13, 2003), 1
Woszczyk is the founder of the Sound Recording program, and a founding director of the Centre for Interdisciplinary Research in Music Media and Technology (CIRMMT) at McGill University

⁴⁰ The Technical Committee of the Audio Engineering Society (AES) defines high resolution in the following way “high resolution refers to extended resolution in bandwidth, dynamic range, and spatial acuity. The achievement of excellent resolution within audio systems is influenced by a wide range of system elements as well as perceptual elements and signal processing. New technologies enabling ever-greater performance continue to evolve, and it is important to study the performance boundaries as the means of enabling a holistic understanding of both technology and supporting perceptual audio theories” (AES Technical Committee, “High Resolution Audio,” accessed November 9, 2010 at <http://www.aes.org/technical/hra>)

that such systems offer benefits that have not been sufficiently quantified by listening tests, and argue that scientific methods have not yet adequately measured all aspects of human hearing. Commenting on the capacity of high-resolution recording formats to increase the perception of realism, John Iverson cites George Massenburg as one of the most important and vocal champions of this approach:⁴¹

George Massenburg [...] enthused about the ability of high-resolution recording to capture "small sounds and localization cues" that add to the realism of playback, but wryly noted that the neurological and psychological processes of hearing, hearing music, and interpreting what we hear are still not well understood. He speculated that we may have reached an impasse in our efforts to improve recording and playback technology until more research is done on the fundamentals of the internal human experience, one that equally involves "ears, brains, and hearts."⁴²

It is clear that physiological and psychological effects of high-resolution recording formats may not be well enough understood to illuminate a clear path ahead in sound recording and reproduction. Woszczyk articulates the need for both technological progress and the artistic input of the engineer in order to “evoke the fullest presence of the original sound” and create an immersive musical experience through sound recording:

Once a transparent high-resolution recording technology is achieved, it can be used to evoke the fullest sense of presence of the original sound—the complete immersion in a rendered auditory scene. Given the artistic and interpretative contribution from the balance engineer, the sense of presence can be enhanced to go further beyond the reality.⁴³

Although “transparent” and “backgrounded” technology is ostensibly the goal, Woszczyk suggests taking the listener “beyond the reality” of the original event by not merely “revealing,” but enhancing the original musical performance through technology. The question of enhancement extends back to at least the mid-1920s, when it became

⁴¹ George Massenburg is a renowned engineer and equipment designer

⁴² John Iverson, “Is There a Future for High-Rez?” *Stereophile*, November 2004, accessed November 9, 2010, <http://www.stereophile.com/news/110104aeshirez/>

⁴³ Woszczyk, “Physical and Perceptual Considerations for High-Resolution Audio,” 8

possible to pick up the acoustics of performance spaces using electric microphones.⁴⁴ Critics debated whether sound recordings should be firmly “realistic” or whether there was room for “romantic” enhancement through technology. The realists were concerned with accuracy, and how faithfully a recording physically matched the sound of the original musical event (i.e., technical fidelity). The so-called romantics accepted enhancements to the sound that they found aesthetically pleasing (e.g., exaggerated low and high frequencies and the attempt to reproduce or enhance features of spatial acoustics) on the grounds that sound recordings were illusions to begin with, and that the “reality” of the recorded musical experience would necessarily differ from that of live performance.⁴⁵ In an article published in 1934, Percy Wilson, the technical advisor for *Gramophone* magazine, reflects on the purpose and the value of sound recordings by comparing his experience at a live performance with his experience listening to the same performance broadcast on the radio the following night. He questions whether the purpose of a sound recording is to replicate the “reality” of the original musical event, or to offer a different “reality” of the same event, and concludes that there is a different, yet equal value in the alternate experience of listening to a sound recording:

Let me confess at once that now my mind is full of doubts; not indeed as to what should be the immediate object of our endeavours, but rather as to what will be their real value in the result. I still think we should strive after an illusion of reality, but I am clear that the particular reality of which we may have an illusion is not likely to be the same reality as that from which our records or our broadcast transmission was derived [...] Although my illusion of the Friday evening [performance] did not therefore correspond exactly with the reality I had experienced on the Thursday [radio broadcast], I claim that it was definitely an illusion of a possible reality and had an even greater value.⁴⁶

⁴⁴ Peter Doyle, *Echo and Reverb: Fabricating Space in Popular Music Recording 1900-1960* (Middletown, CT: Wesleyan University Press, 2005), 59

⁴⁵ Oliver Read and Walter Welch, *From Tin Foil To Stereo: The Evolution of the Phonograph* 2nd ed (Indianapolis, IN: H. W. Sams, 1976), 373–389.

⁴⁶ Percy Wilson, “Reproduction and the Real Thing,” *Gramophone*, July 1934, 49–50.

Whether a recording should reproduce the sound of a concert hall performance, or whether it should offer an alternative listening experience is a perennial concern in audio magazines, and the fact that this discourse is overwhelmingly centered on classical music recordings clearly suggests that these issues are of particular concern in this domain. When listening to music on “high-fidelity” audio systems became a mainstream hobby in the 1950s, this debate was expressed as confusion over the definition of high-fidelity. Is high-fidelity the accurate reproduction of sound sources, or is it the enhancement of the original sound through technology? The editor’s report from a 1955 issue of *Audio* magazine defines high-fidelity as “a high degree of faithfulness to the original sound” and equates it with “naturalness.”⁴⁷ The editor suggests that the listener compare the sound of a recording to the sound of live performance to determine whether or not a recording is high-fidelity. “Does the symphony orchestra, dance band, chorus, single instrument, or voice coming from a recording, radio, or TV sound ‘natural,’ much as it does when you hear it ‘live’ in the concert hall or studio?” Meanwhile, Edward Tatnall Canby, the record reviewer for the same magazine, is adamant that the aim of high-fidelity is not the accurate reproduction of a concert hall performance, but is an art unto itself than can (and should) provide an enhanced listening experience:

I do not believe, as many do, that the ultimate aim of hi-fi is to re-create an illusion of the concert hall. I will stand up vehemently for all experiments and all developments in hi-fi recording technique that explore these special laws, for all engineering tricks, hi-fi or otherwise, that bring better sense and clarity and beauty to all recorded material—whether it sounds like a concert hall or not.⁴⁸

However, he also emphasizes that technology should *enhance* the music, not detract from it: “The hi-fi records that I don’t like are the ones that—intentionally or not—reverse this

⁴⁷ C. G. McProud, “Editor’s Report,” *Audio*, July 1955, 12.

⁴⁸ Edward Tatnall Canby, “Record Reviews,” *Audio*, December 1954, 44.

principle,” he wrote. “They don’t project the material, they project the recording technique.”⁴⁹ Elsewhere, he wrote:

More and more we are realizing that the successful ‘hi-fi record’ must hit the jackpot in a whole series of precise areas of technical and musical skills [...] We’ve been rapidly realizing the last few years that, whether via one mike or many, the maximum effectiveness for recorded sound depends on what is essentially a sort of audible trickery, a kind of illusion that has its own values decidedly unlike those of the much-touted concert hall sound.⁵⁰

In this case, the editor is the “realist” and Canby the “romantic.”

In 1988, the current and former editors of *Stereophile* magazine (John Atkinson and J. Gordon Holt, respectively) debated a similar issue. Their debate was less about how the sound engineer should translate a performance to the recorded medium, and more about how the listener should evaluate the quality of their playback system. According to Holt, the measure of “high quality audio” is the accurate reproduction of an acoustic event. Holt maintains that the sound of a live orchestra should be the yardstick for measuring the fidelity of home audio systems. He is nostalgic for an earlier time when

audio was driven by an ideal that was shared by all, and perfection in audio was easily defined and universally accepted: It was the sound of a live orchestra (or any other producer of musical sounds) in its natural acoustical habitat. The ability to reproduce that sound was the measure of fidelity—the yardstick by which equipment designers gauged the success of their efforts and set the goals for future designs.⁵¹

Atkinson responded by stating that, “accuracy may be desirable, but it is only relevant if the system can convey the emotion in music [...] Who cares whether a component is ‘accurate’ or not if its owner can’t stand listening to it?”⁵² Atkinson is clearly adopting the “romantic” position in this debate and Holt the “realist.” Atkinson considers the

⁴⁹ Ibid 44.

⁵⁰ Edward Tatnall Canby, “Record Reviews,” *Audio*, July 1954, 40

⁵¹ J. Gordon Holt and John Atkinson, “The Acoustical Standard (With Follow-Up),” *Stereophile*, October 25, 1988, <http://www.stereophile.com/asweseet/111/index.html>

⁵² Ibid.

emotional response to the music to be of greater importance than so-called accurate reproduction. Holt articulates a fear that if there is no shared standard by which to measure technical fidelity (i.e., the sound of a live acoustic performance), then future research in audio will be rudderless and improvements difficult to measure:

The problem with this ‘sounds good’ approach is that it is so subjective that anything goes. It makes audio quality nothing more than a matter of opinion, in which anyone’s opinion is as valid (or otherwise) as anyone else’s [...] This is not to imply that real music doesn’t sound pleasant; just that there is an almost limitless range of ‘pleasant’ reproduced sounds, most of which don’t relate to realism.⁵³

A problematic aspect of Holt’s position is whether or not there can be consensus on the “reality” against which sound recordings should be measured, and furthermore, whether such a notion remains stable over time. He eventually concedes the point with a question, “What is ‘realism’ in 1988? It’s not what it was in 1955.”⁵⁴ Indeed, attendance at classical music concerts has declined since the 1950s, but the consumption of classical recordings has increased exponentially. It is therefore likely that the sound of concert hall performances—so-called “concert hall realism”—is much less relevant, if not an increasingly foreign reference point for contemporary audiences. It is questionable how familiar past or present listeners are with concert hall sound given the relatively limited access to concert venues compared with the widespread dissemination of recordings and radio broadcasts. Is the average listener (past or present) concerned with accurate reproduction of the concert hall experience, or do they simply choose recordings that “sound good” and elicit a desirable emotional response?

In a study on listener preference for cinema sound, Durand Begault shows how, when given the choice, listener preference is not necessarily that of the ideal or original

⁵³ Ibid.

⁵⁴ Ibid.

playback conditions set by experts in the industry.⁵⁵ Modern cinemas are designed to be less reverberant spaces in accordance with industry standards such as THX. When given the choice between a less reverberant modern cinema (the reference standard, with a reverb time of less than 0.3 seconds) and two other cinemas with higher reverb times (1.2 and 1.0 seconds), listeners strongly preferred the cinema with a reverb time of 1.0 second. The modern cinema offers optimal speech intelligibility and a more accurate reproduction of spatial effects, however, when given the choice of auditioning a film in a more reverberant environment, the industry standard was not preferred by listeners in Begault's study. Why listeners chose the cinema with a higher reverb time is unclear, however there were reports that it sounded more "natural," and Begault speculates that feelings of nostalgia were also at play.⁵⁶

In the same paper, Begault also outlines the complications that everyday listening bring to the question of fidelity. While standards have been applied to cinematic sound with varying degrees of success, standardization of home audio systems is nearly impossible. Sound engineers do not know which sound systems listeners are using and how they are manipulating them. When making a recording, the sound engineer must consider a variety of sound systems and environments such as the traditional home "hi-fi" system, the automobile system, the portable boom box, as well as portable systems employing headphones. Furthermore, listeners participate in the playback process: they frequently choose loudspeakers that "colour" the sound, they place loudspeakers in

⁵⁵ Durand Begault, "Preference Versus Reference: Listeners as Participants in Sound Reproduction" (paper presented at the Spatial Audio & Sensory Evaluation Techniques conference, Guildford, UK, April 6–7, 2006). Begault is a researcher in Human Systems Integration at NASA's Ames Research Centre in Moffett Field, CA.

⁵⁶ See, for example, Fred Davis, *Yearning for Yesterday: A Sociology of Nostalgia* (New York: Free Press, 1979); Janelle Wilson, *Nostalgia: Sanctuary of Meaning* (Lewisburg: Bucknell University Press, 2005).

various locations, they wander through listening spaces, and they listen with varying levels of attention. The growing number of systems used to listen to music recordings has lead not only to questioning the concert hall as a reference point, but also to questioning the reference of the playback system itself.

While there have been measurable improvements in technical fidelity, it is much harder to evaluate improvements in the degree of “realism” achievable in sound recording and reproduction. Creating a realistic-sounding recording is a subjective process given that, among other factors, consensus on the perception of “reality” is tenuous, and fully three-dimensional reproduction is not possible. Technology cannot be an impartial mediator because sound engineers and listeners must operate it. As we have seen, from a technical perspective, there is confusion over the reference point to which a recording should be faithful. Should a recording be faithful to the concert hall experience, or to an ideal reference condition (i.e., the engineer’s studio environment)? The latter suggests another site of authenticity: hearing the music the way the sound engineer (or production team) intended.

Evaluating sound recordings based on the “accurate” reproduction of an acoustic performance tends to be the preoccupation of a relatively niche group of audiophiles (both hobbyists and industry professionals). The widespread adoption of listening to music on mp3 files—a comparatively low-quality audio format containing less information—indicates that “high-quality audio” may be currently less important to the average listener than having a format that is easily stored and shared. Granted, the average listener typically does not have access to a “high quality audio” environment (e.g., a professional studio) by which to compare the sound of an mp3 to the sound of the

same recording in a reference condition.⁵⁷ Yet Begault's study shows that even when given a choice, listener preference may deviate from the reference condition for reasons that are complex and difficult to quantify.

To summarize, the notion of fidelity is often complicated by a basic confusion over the purpose of the recorded medium. Whether or not a sound recording can or should accurately reproduce a live event—whether the technology should ultimately function as an impartial mediator—seems to be an ongoing question for listeners and technical personnel alike. In many cases, it seems that the “romantic” idea of *preference* (the privileging of an aesthetic and/or emotional response and a pleasurable listening experience) has been widely embraced over the “realist” idea of *reference* (accurate reproduction of the original event). Aside from a niche group of audiophiles, the average listener does not seem concerned with accurate reproduction of either the concert hall experience or an industry reference condition, and comments from Woszczyk and Massenburg suggest that the role of the engineer is ultimately to convey the music in a way that creates an immersive and pleasurable experience for the listener.

Privileging the “Live” Over the Mediatized

A philosophy of mediation is not particularly helpful for making sense of the way live performance and mediatized representations become intertwined, or for understanding the nuances of how meaning is ascribed to the live and the recorded. From a perspective whereby the recording is supposed to be faithful to some abstract notion of an original

⁵⁷ Perceptual codecs like mp3 dramatically reduce bit-rates of files, enabling faster transmission and smaller file size. See Karheinz Brandenburg, “MP3 and AAC Explained,” *The Proceedings of the 27th International Conference of the Audio Engineering Society*, Hillerød, Denmark, September 2–4, 2005, Karheinz Brandenburg, “Why We Still Need Perceptual Codecs,” *The Proceedings of the 18th International Conference of the Audio Engineering Society*, Burlingame, California, March 16–18, 2001

event, it is assumed that the “live” is inherently more “real” and therefore the ultimate source of authenticity. But does the recording always derive its authenticity from the live, or does the live also derive authenticity from the recording? As recordings become the dominant music listening experience in Western culture, live performance begins to imitate or otherwise come into dialogue with mediatized representations. Contrary to the idea that recording only documents or mediates a performance, a recursive feedback loop occurs between the two. For one, sound recording alters the audience’s aesthetic expectations (e.g., the balance and quality of the sound) and their expectations of the performers (e.g., very high technical proficiency). A performer’s ability to recreate the sound of the recording, live, is sometimes used to validate both their musicianship and the recorded performance. Then again, some also attend live concerts to hear something different or to listen for differences between the live performance and the recording. In any case, recorded music changes the dynamics of live performance in ways that are not always self-evident.

In an important essay titled, “The Prospects of Recording,” Glenn Gould lists several observations on the influence of sound recordings in classical music culture.⁵⁸ He claims that listeners have become accustomed to the “analytic clarity, immediacy, and indeed almost tactile proximity” of recorded sound, and that these characteristics—in North America at least—now inform the desired sound of the concert halls, which are often much less reverberant and may use amplification.⁵⁹ He predicts that the aesthetics of recorded sound will continue to influence the preference and expectation of audiences:

⁵⁸ Glenn Gould, “The Prospects of Recording,” in *The Glenn Gould Reader* ed. By Tim Page (New York: Knopf, 1984), 331–353.

⁵⁹ *Ibid.*, 333.

It is quite likely that these preferences engendered by phonographic reproduction—clarity of definition, analytic dissection by microphones, catholicity of repertoire, etc.—will determine to a considerable extent the kind of sound with which we shall want our musical experience to be endowed.⁶⁰

He also attributes the revival of Baroque, Renaissance, and pre-Renaissance music to sound recording. According to Gould, the Baroque style is particularly well suited to the recording medium because close-microphone techniques can articulate complex contrapuntal lines, pick up the timbral nuances of Baroque instruments, and stereo imaging can enhance antiphonal passages.⁶¹ Therefore, to Gould's mind, interest in this music was first revived through the agency of sound recordings, and subsequently re-entered the standard performance repertoire.⁶²

“Being There”

The line between live performance and recorded media is often blurred and many events incorporate both. Using the opposing poles of the live and recorded as reference points, Steve Wurtzler identifies four basic positions based on the audience's relationship to the original event that show various combinations of live and mediatized performance.⁶³

⁶⁰ Ibid , 340

⁶¹ Ibid , 335

⁶² Ibid , 335

⁶³ Steve Wurtzler, “‘She Sang Live, but the Microphone Was Turned Off’ The Live, the Recorded and the Subject of Representation,” in *Sound Theory, Sound Practice*, ed Rick Altman (New York: Routledge, 1992), 89

	Spatial co-presence	Spatial absence
Temporal simultaneity	Position I (Live)	Position II
Temporal anteriority	Position III	Position IV (Recorded)

Position I: live performance

Position II: “live” radio and television broadcasts, telephone

Position III: lip-synching, television replays at live events

Position IV: recordings

Figure 1. From Steve Wurtzler, “She Sang Live, but the Microphone Was Turned Off: The Live, the Recorded and the *Subject* of Representation,” 89.

Experiencing live performance (Position I) is understood as spatial co-presence and temporal simultaneity (Wurtzler’s terms). The recording (Position IV) is the opposite: spatial absence and temporal anteriority. The other two other possible combinations in Wurtzler’s scheme are spatial co-presence and temporal anteriority (Position III), and spatial absence and temporal simultaneity (Position II). In position III, the audience is physically present at an event, however the event itself incorporates pre-recorded material. Examples of this would be watching replays on television screens at a sporting event, or a singer lip-synching to their recordings in concert (of which the audience is unaware, ideally). In Position II, the audience is experiencing the live event in real-time, but they are not physically present at the event. Examples include live radio and television broadcasts, and using the telephone. Making a clear distinction between what constitutes live and the recorded (or mediatized) is not easy, nor are these examples new phenomena given that radio and telephone technologies have been available for over a century. Philip Auslander claims that, “live performance now incorporates mediatization

to the degree that the live event itself is the product of media technologies,” particularly for large-scale events.⁶⁴ Sound is mediated through amplification and large video monitors are an important component of many concerts and sporting events. People further away from the live event, although spatially and temporally co-present, experience much of the so-called live performance through these technologies. This experience is still considered “live.” There is thus a sense of “liveness” in an experience that incorporates recorded material or that is technologically mediated. One could argue that a live recording (Position IV) also elicits a feeling of “being there.” Classical orchestral music is typically recorded with the idea of eliciting this kind of listening experience.

Live performance is often valued for its supposed spontaneity, community, presence, and interaction between the audience and the performer. Its unique and fleeting existence in time and space—in the “now”—supposedly enables it to defy representation and thus mass-reproduction and commodification. Performance theorist Peggy Phelan claims that “performance’s independence from mass reproduction, technologically, economically, and linguistically, is its greatest strength.”⁶⁵ Auslander argues that in Western societies, it is unlikely that live performance can somehow escape the influence of the dominant mediatized environment:

I doubt very strongly that any cultural discourse can stand outside the ideologies of capital and reproduction that define a mediatized culture or should be expected to do so, even to assume an oppositional stance [...] It is not realistic to propose that live performance can remain ontologically pristine or that it operates in a cultural economy separate from that of the mass media.⁶⁶

⁶⁴ Philip Auslander, *Liveness: Performance in a Mediatized Culture* (London; New York: Routledge, 1999), 25.

⁶⁵ Peggy Phelan, *Unmarked: The Politics of Performance* (London; New York: Routledge, 1993), 146.

⁶⁶ Auslander, *Liveness*, 45.

He challenges the qualities that theorists such as Phelan assume are inherent in live performance. I will briefly summarize some of Auslander's critique.

While the content of a recording is fixed, the content of live performances are also relatively fixed and performers often strive to reproduce the same event in a parallel kind of "mass-reproduction."⁶⁷ For example, a traditional theatre production is expected to be performed the same every night and the company rehearses to keep variations between performances minimal and insignificant. Improvisational comedy and jazz are more spontaneous forms of performance, however, these genres still have a basic structure and set of conventions to which the audience expects the performers will adhere. A jazz musician is expected to play jazz, and the audience might well become irate if a jazz musician instead set up a DJ station and played Top 40 recordings. On the other hand, a DJ who chooses tracks by gauging the audience's energy level and response to the music arguably provides a more interactive and spontaneous performance than a classical concert with a set program. While there is the possibility of spontaneity in live performance, given the expectations of the audience, this is not necessarily a defining or inherent characteristic.

Auslander rejects the idea that the experience of live performance can build community any more than mediatized reproductions, or that this somehow distinguishes the live from the mediatized. Mediatized events can be just as effective as focal points for social gatherings. Examples include Jamaican sound system trucks, juke boxes in pubs and bars, raves, and DJ culture in general. Recorded music can draw large crowds. Alternatively, listening to records can be an event for a small group of friends who share

⁶⁷ It should be noted that it was precisely this mechanical and uncreative aspect of concert touring that led Glenn Gould to reject live performance. See Tim Page, "Coda: Glenn Gould in Conversation With Tim Page," *The Glenn Gould Reader*, 451

similar musical tastes, just as when people throw parties for televised events such as the hockey playoffs or the Academy Awards. Auslander dismisses the idea that live performance is more effective at bridging the gap between the performer and the listener. In fact, he suggests that live performance might frustrate the desire for communion more so than mediatized representations because at a live performance there is actually the *potential* for interaction between the performer and the audience. That the performers are there in person makes interaction conceivable in the minds of the audience. This is not an issue with recordings where interaction can only be between audience members and obviously not with the performers. While there are certainly performers who inspire greater feelings of connection and intimacy in a live performance, others do not. Sharing a physical space does not guarantee greater intimacy, connection, or community between the audience and the performers. Glenn Gould contended that the experience of art has little to do with face-to-face communication between the performer and the audience. His answer is a bit esoteric, however his opinion is in line with Auslander's thinking:

There are those, of course, who counsel that only in the theatre, only with the direct communication of artist to listener, can we experience the high drama of human communication. The answer to this, it seems to me, is that art on its loftiest mission is scarcely human.⁶⁸

Auslander argues that the qualities ascribed to live performance are culturally and historically contingent, and that there is no reason to inherently privilege live performance over mediatized representations. To do so, for Auslander, merely reflects the concerns of a particular era. In a capitalist culture that is increasingly dominated by mass media, live performance is often looked upon as a site of resistance to representation and commodification. However it seems primarily ideological to ascribe these emancipatory-

⁶⁸ Glenn Gould, "Let's Ban Applause!" in *The Glenn Gould Reader*, 247.

like qualities to it, given that the live and the mediatized cannot exist in isolation or resist the influence of one another. Live performance can certainly create feelings of community and transcendence, however Auslander invites us to reflect more critically on why we attach such values more readily to live performance than mediatized art forms.

Privileging live performance and a direct model of communication renders any kind of mediation through technology suspect. Mediation risks distorting or otherwise changing the message. Although sound recordings have become an important part of classical music culture, live performance continues to have privileged status. Because the composition of the majority of masterworks in the classical canon precedes the invention of sound recording, hearing the repertoire performed live could be considered a more authentic experience of the music. Classical music listeners tend to take the live performance as an initial reference point. Because technology cannot fully reproduce an original musical event, however, sound engineers and producers must make a series of technical decisions about how to convey the impression of live performances on recordings.

Chapter Three: Issues of Fidelity in Recording Classical Music

Classical music recordings have consistently used the live performance as a conceptual and aesthetic reference point, and while the goal of re-creating the live aesthetic is shared by classical engineers and producers, the means for achieving this end varies widely. Some discourse on the recording process for classical music portrays the use of fewer microphones and less signal processing as creating more faithful representations of sound sources. There is a notion that techniques which mimic the human hearing system create more natural-sounding recordings (e.g., stereophonic microphone techniques), and that such technologies are less intrusive and more transparent than those associated with popular music recordings (e.g., multi-microphone and multitrack recording techniques). The discourse is thus that minimal miking and processing involves less mediation between the original event and the listener. In practice, a variety of methods are used for producing realistic-sounding recordings. Additionally, it is clear that accurately representing all aspects of a performance is not the ultimate goal. There are aspects of live performance that are undesired on a recording, such as incorrect notes, extraneous noises, and the balance of direct to reverberant sound. While the live performance is a starting point, engineers and producers typically create an enhanced representation. Because we cannot objectively reproduce a live performance, it is the role of the engineer and producer to choose a listening perspective. This is usually an ideal perspective that is not achievable as an audience member.⁶⁹ This chapter focuses on the role of the engineer and producer, and the various approaches to making a classical music recording.

⁶⁹ For example, for an orchestral recording, the microphones are frequently placed above the conductor.

The Role of the Sound Engineer and Producer

In a classical music context, the roles and tasks of the sound engineer and producer are clearly defined. The sound engineer is responsible for the technical aspects of the recording project, while the producer is responsible for realizing its artistic goals and overseeing the entire production. The engineer places the microphones, balances the sound of the instruments, and uses other signal processing to manipulate and optimize the sound. The producer “blocks” the score,⁷⁰ chooses the edits (usually in consultation with the artist), lends a more objective set of ears, takes responsibility for musical decisions, and coaches the performers through the recording session.⁷¹ It is also the producer’s role to assure that the performance follows the score.⁷² While it could be argued that the engineer and producer contribute creatively to the overall sound of the recording, they do not add to the musical content *per se*. Their role is to record an ideal performance. Popular music genres adopted sound recording technology as a compositional tool as well as a way of representing live performance, therefore producers and engineers in these genres are sometimes understood as artists in their own right.⁷³ The distinction between the technical personnel and the artist is increasingly blurred in a context where the use of technology shapes the musical content, as it does in popular music.

Classical music engineers and producers often understand their role as facilitating the recording of a musical performance and cast sound recording as a craft rather than an

⁷⁰ Indicating on the score which takes will be used for each section is commonly referred to as “blocking the score.”

⁷¹ Peter Hill, “A Short Take in Praise of Long Takes,” in *Recorded Music Performance, Culture, and Technology*, ed Amanda Bailey (Cambridge: Cambridge University Press, 2009) 13–15

⁷² Howard Massey, “The (Very) Different Worlds of Classical and Jazz Recording,” *Home Recording*, September 2002, 52

⁷³ See Edward R. Kealy, “From Craft to Art: The Case of Sound Mixers and Popular Music,” in *On Record: Rock, Pop and the Written Word*, Simon Frith and Andrew Goodwin eds (Routledge, 1990), 172–184

art form by emphasizing their role as technical mediators rather than artistic contributors. Producer John Culshaw observes that a shift took place in the 1960s such that consensus emerged that sound recording technology had become complex enough to warrant specialized knowledge and dedicated personnel:

It is still true that all the machinery and all the assembled skills are there for the single purpose of getting the artist's performance on a record; but the means of achieving that end have become far too complex for the artist to command the *method* in the way that was far too common until a few years ago...as a rule, the artists today understand that the actual techniques of recording are best left to those who understand them.⁷⁴

Culshaw also comments on a tendency for artists to belittle the technology, and to express distrust and concern over how it mediates between themselves and the audience:

[Conductors] resented what they thought was the intrusion of technology between themselves and their audiences, while forgetting that enlightened technology exists only to aid that communication. Certainly they would never have adapted themselves to today's studio requirements [...] the attitude derived from the assumption that the gramophone record was still a toy which was not to be taken very seriously.⁷⁵

Culshaw understands his role as facilitating communication between performers and audiences, and contends that sound recording technology need not interfere with the message if it is handled properly, and by an expert. This quote suggests that even if the technical personnel are not completely impartial mediators, that their role is to aid communication, and their intentions should be in the best interests of the artist, in spirit, at least.

⁷⁴ Culshaw, *Ring Resounding*, 27

⁷⁵ *Ibid.*, 27 Glenn Gould emphasizes precisely the same point in "The Prospects of Recording."

Performing in the Recording Studio

For a classical musician, performing in a recording session is quite different from the live performance context for which most of them have been trained, and the unfamiliar setting and protocol can be stressful. The technical personnel are comfortable in the recording studio, and therefore it is part of their job to put the musician(s) at ease. From the perspective of a classically trained musician, one might even ask whether playing for a recording can be considered a performance at all, because so many of the defining elements are missing: there is typically no audience; the tension and excitement of having only one chance to play through a piece is absent; mistakes can be edited out; and if there are overdubs (which are not unheard of in classical recording), the performance is asynchronous.

Furthermore, the physical set-up of a recording session is quite different from a live performance, even when every effort has been made to make it as familiar as possible. The performers need to be aware of playing to the microphone (and not away from it) in order to obtain a consistent and optimal sound, and they may be asked to play in different seating arrangements to help the engineer adjust the balance, or to isolate the sound of selected instruments. For technical reasons, performers and technical personnel usually work in separate physical spaces during a recording session. The engineer and producer need an isolated space (the control room), away from the performance, in order to hear the recorded sound. The technical personnel set-up a talkback system to communicate with the performers from the control room (over loudspeakers), and the performers can speak to the technical personnel either through a designated microphone or through other microphones in the recording space. If the performance space is not

visible from the control room, a video system is often set up to monitor the performers. Although communication can flow both ways, the technical personnel can always monitor what is happening in the performance space, whereas the performers are given no such resources to monitor the technical personnel. Alan Williams suggests that the architecture of the recording studio is similar to a “panopticon” and “panauralcon” where the performers are continually under surveillance.⁷⁶ Although control over the technology potentially creates a power imbalance between the performers and the technical personnel, such a scenario arises primarily for ostensibly technical reasons—it is not deliberate or calculated surveillance for the purpose of intimidation. The technical personnel also become the audience for the performers. Understood as such, however, they constitute an audience with very specialized knowledge and training to scrutinize the sound and the performance. While they are a potentially intimidating audience, it is in their best interests to neutralize any real or perceived power imbalances that may exist in order to create a productive environment and make the performers as comfortable as possible. Overcoming the barriers to communication in the studio, and putting the musicians at ease is an important skill for engineers and producers. It is particularly the role of the producer to offer the performers support, encouragement, and constructive criticism in order to evoke the best possible performance. Good communication and a warm and respectful relationship between the technical personnel and the performers are vital to the success of any classical music recording session.

⁷⁶ Alan Williams, “Divide and Conquer Power, Role Formation, and Conflict in Recording Studio Architecture,” *Journal of the Art of Record Production*, February 2007, accessed February 17, 2011 <http://www.artofrecordproduction.com/content/view/203/104/> A panopticon is an architectural design that allows a person in a central location to observe all the occupants of the building without being visible to them. It is associated with prison designs and surveillance.

Technical Intervention and Classical Music Recording

There is a notion in discourse on sound engineering that less technical intervention (e.g., minimal miking and processing) will result in a more faithful representation of the live performance. Streicher and Everest adopt this position in their manual on stereo recording techniques. They distinguish between two fundamentally distinct approaches to sound recording: *re-creative* and *creative*.⁷⁷ They define these terms as follows:

[a re-creative recording makes] listeners feel that they are listening to a real event—something that actually happened, or could have happened—that has been transferred in time and/or space and transported into their presence via the recording process...[whereas a creative recording] brings to the listener an experience which never happened in ‘real time’, but which the creators of the sonic illusion would like to have happen.⁷⁸

According to Streicher and Everest, “creative” recording audibly foregrounds the technology by using signal processing effects: spectral processors such as equalization and distortion are used to alter timbre; compressors and limiters are used to shape the dynamic range; panning is used to position sound sources and reverb to create artificial spaces. These effects do not occur without the application of sound recording technology. For a creative recording, there is no reference point outside the technology within which the recording aims to situate the listener. A creative approach is typical of popular music recordings:

In many cases of pop music and cinema or TV sound one is dealing with an entirely artificial creation that has no ‘natural’ reference point or perceptual anchor. Here it is hard to arrive at any clear paradigm for spatial reproduction, as the acoustic environment implied by the recording engineer and the producer is a form of ‘acoustic fiction.’⁷⁹

⁷⁷ Streicher and Everest, *The New Stereo Soundbook*, § 4.2.

⁷⁸ *Ibid.*, § 4.2.

⁷⁹ Frances Rumsey, *Spatial Audio*, 8.

A “re-creative” recording implies a “natural” environment—one that exists outside sound recording technology. The instruments should sound together in the same acoustic space, their relative locations should be approximated on the recording, and any artifacts from the equipment (noise and distortion, for example) should be minimized. The technology should fade into the background to facilitate a listening experience of “being there,” of hearing the event unmediated by recording technology. With few exceptions, this has been the approach adopted by engineers of *classical music* recordings:

In classical music recording and other recording genres where a natural environment is implied or where a live event is being relayed it is often said that the aim of high quality recording and reproduction should be to create as believable an illusion of ‘being there’ as possible. This implies fidelity in terms of technical quality of reproduction, and also fidelity in terms of spatial quality.⁸⁰

In addition to creating artificial or realistic-sounding spatial scenes, Streicher and Everest describe two listener perspectives that are related to the kind of spatial illusion created on a recording. The perspective “you are there” aims to transport the listener out of the listening environment and into another space (the *Virtual Haydn* project described in Chapter Five is an extreme example of this orientation). The perspective “they are here” aims to bring sound sources into the listener’s environment.⁸¹ Figure 2 shows a matrix created by Streicher and Everest that describes the conventional techniques for achieving four basic approaches to sound recording.⁸²

⁸⁰ Ibid , 8

⁸¹ Streicher and Everest, *The New Stereo Soundbook*, § 4.3

⁸² Ibid , § 4 4

	RE-CREATIVE [less technical intervention]	CREATIVE [more technical intervention]
YOU ARE THERE	Simple [stereo microphone] techniques [], preservation of natural ambience, minimal enhancement of original acoustics	Multi-microphone and/or multi-track techniques, special effects processing, synthesis, creation of artificial ambient space' "Anything goes "
THEY ARE HERE	Coincident microphones or close multi-microphone techniques, little natural ambience in the recording, close, intimate sound	Multi-microphone and/or multi-track techniques, special effects processing, little ambient space, deliberate placement of sonic elements, "Anything goes "

Figure 2 Matrix adapted from Streicher and Everest, *The New Stereo Soundbook*, § 4.4

Their description suggests that the main difference between re-creative and creative approaches to recording is the amount of technical intervention and manipulation. For re-creative recordings, they prescribe stereo techniques using few microphones and minimal processing. While minimal processing may indeed seem ideal for a re-creative approach, Streicher and Everest's matrix understates the extent to which re-creative recordings can involve considerable technical processing. The following descriptions from classical sound engineers suggest that while they might subscribe to the ideal of minimal technical intervention for making re-creative classical music recordings, such recordings are often made using what Streicher and Everest consider "creative" techniques. Recording techniques vary between sound engineers and producers, but can be loosely thought of on a spectrum between "purists" who insist on minimal miking and processing, and so-called "mavericks" who use techniques and processing that is more akin to popular music production.⁸³ Concerning classical orchestral recording, Blair Jackson writes

There are still some purists who fully embrace these proven "old-school" [minimal miking] techniques, but it has been much more common during the

⁸³ Paul Verna, "The Changing Landscape of Orchestral Recording," *Mix* November 1, 2000. Accessed March 3, 2011. http://mixonline.com/mag/audio_changing_landscape_orchestral/index.html

multitrack age for engineers to augment either the Blumlein or Decca setup (often modifying each) with spot mics over small groups of players or sections of the orchestra that can be brought into the mix later. All four of these engineers [Lawrence Rock, Allen Sides, John Kurlander, and John Rodd] favor a modified Decca Tree with spot mics. And, not surprisingly, surround recording also considerably changes the mic equation.⁸⁴

Paul Verna describes how the goal of re-creating the sound of a live performance has remained unchanged, although the means for achieving this end have changed with new developments in audio technology:

These days, orchestral recording takes almost as many forms as pop recording, with spot mics, multichannel arrays, post-production and editing among the techniques employed to deliver the final product to the home. In most cases, the object is the same: to convey as realistic a sonic image of the orchestra as possible. However, the means by which producers, engineers and label owners arrive at their final goal vary widely.⁸⁵

Steven Epstein explains that he prefers to use as few microphones as possible for a classical music recording, and that he considers this to be a more “natural” technique. However, he adds that “you can also do a natural-sounding classical recording using 20 mics,” and that this often depends on the acoustics of the recording venue.⁸⁶ John Rodd explains how the demands of the music (and sometimes the demands of the composer) also factor into technical decisions:

There are so many variables to consider before you start recording. Is there a huge dynamic range [in the music]? Are there featured soloists? Is there any musical element that's more important than anything else? Is it a lush pastoral score or more aggressive and edgy? Sometimes you have to pick which mics and mic placements are going to work for what the composer likes: Do they like an aggressive sound or a more lush sound overall?”⁸⁷

⁸⁴ Blair Jackson, “Orchestral Recording,” *Mix*, January 1, 2006. Accessed March 3, 2011. http://mixonline.com/mag/audio_orchestral_recording/index.html.

⁸⁵ Paul Verna, “The Changing Landscape of Orchestral Recording.”

⁸⁶ Howard Massey, “The (Very) Different Worlds of Classical and Jazz Recording,” 52.

⁸⁷ Blair Jackson, “Orchestral Recordings.”

He then proceeds to illustrate how the physical constraints of a particular recording studio can dictate the physical set-up of an orchestra. In the following quote, he describes doing a film music recording at Capitol Studios where he felt it necessary to split the orchestra between two studios.⁸⁸ In order to gain more control over the sound, he put the brass section in Studio B, and the strings and woodwinds in Studio A. They were sonically isolated by a glass wall, but still visually connected. He claims to prefer having everyone play together in the same room. In this case, however, getting the sound he wanted took precedence over having the orchestra seated together:

I put the strings and woodwinds in Studio A and then I put in the glass wall that divides A and B, and had the French horns, trumpets, trombones and tuba in Studio B. I put the conductor with his back to the glass wall that divided the two rooms...Depending on the writing of the music, the brass and so forth can overcome the smaller string section if they're all in one room. So the way I set it up, as it was a loud score, the brass could play as loud as they wanted and I could still have a refined string sound because the spot mics could be a little farther away from the instruments. It also really helped with editing because we could edit the brass differently than the strings as we had total isolation. Don't get me wrong — I'm a big proponent of having everyone in the same room at the same time, but with that particular size of an orchestra, that's a good way to work if you are at a studio like Capitol.⁸⁹

Sound engineers and producers consider many factors when making technical decisions. Even if the ideal is to record a classical ensemble with a simple microphone set-up and minimal processing, this may not be feasible in a particular recording session, or may not yield satisfactory results. For example, Lawrence Rock explains that he typically adds additional reverb to live concert recordings of the New York Philharmonic because the audience makes the hall less reverberant:

When you're recording live, you're dealing with an audience and the noise they make, and any concert hall is going to become less reverberant when people are in

⁸⁸ Capitol Studios is a prestigious and well-known studio in Hollywood, CA.

⁸⁹ Blair Jackson, "Orchestra Recording."

it. As a result, I have to use digital reverb; in fact, I've often said that I've built my career on the judicious use of digital reverb.⁹⁰

A little extra reverb could be considered minimal processing, but the larger point is that the sound engineer will do whatever processing is necessary to achieve the desired result, and this may deviate from the “reality” of the actual performance. Rock clearly states that he is creating an idealized representation of a performance:

[What] you're really creating is an idealized version; what we're creating is an illusion. Microphones don't hear the way ears do — you don't have the brain to sort it all out until you're listening on the other end, and then you're listening to speakers or headphones. So you're really creating a whole sound that's certainly related to the source, but it's hardly an exact replication.⁹¹

The live performance may be the initial reference point for a classical music recording, but the decisions the engineer and producer make to optimize the recording obviously stem from other notions of how a classical music recording should sound. While it is difficult to know what factors inform their aesthetic decisions, it is likely that other recordings serve as an important reference point as well. Contrary to what Streicher and Everest suggest, minimal technical intervention is not the *sine qua non* of re-creative recording because, as we have seen, classical sound engineers use a variety of recording techniques to achieve this result and some of their methods involve considerable technical intervention and processing. Therefore, what distinguishes a re-creative recording can only be that such a recording is modeled on a live performance.

Privileging Face-to-Face Communication

The assumption that more technology necessarily interferes with the transmission of content to the listener is premised on a model of direct communication where less

⁹⁰ Ibid.

⁹¹ Ibid.

mediation means less opportunity for manipulation and distortion and therefore more honest and authentic communication.⁹² From this standpoint, face-to-face interaction is the most ideal form of communication according to this philosophy. Sterne points out a basic conflict between desiring Enlightenment values such as equality and democracy—ideals that are elevated in contemporary Western societies—and privileging a *direct* model of communication. The contradiction he sees is that the flexibility for people to transcend their personal circumstances—the necessary condition for equality and democracy—requires large-scale societies, and large-scale societies require forms of communication that can reach, and are accessible to large numbers of people: “Communication is a collective endeavor, not reducible to a model of two people talking [...] good sound—and good communication—emerges from the many, and from many it travels to one or many.”⁹³

Sterne insists that we recognize the role of everyone involved in communicating: the speakers, the listeners, and those enabling the communication. This, he claims, is a better starting point for theories of sound and communication because otherwise the tendency is to place disproportionate value on the agency of the individual voice (the speaker)—or a group acting as if it had a single voice—and to forget the agency of the listeners and those who make communication possible:

The agency always resides in the social relation making possible the moment of sonic communication. By emphasizing the voice of the individual and the desirability of its persistence in dialogue, we forget all the other—possibly mute—people who enable and structure even the most fleeting moment of dialogue. The persistence of the voice as a metaphor for political, cultural, or

⁹² Simon Frith, “Art Versus Technology: The Strange Case of Popular Music,” *Media, Culture and Society* 8 (1986): 267.

⁹³ Sterne, *The Audible Past*, 343–344.

sonic agency both leaves aside the potential agencies of listening and promotes a fundamental hostility to large-scale society.⁹⁴

Sound recording and other electronic processing technology (such as amplification) make it possible to communicate music to larger audiences than what would be possible through live acoustic performance.

The technical personnel—notably the engineer and the producer in the sound recording industry—are often among the “possibly mute” people who enable and structure communication through technology. Their deliberate “absence” is particularly true for classical music recordings where the recording aesthetic is re-creative and the technology (i.e. the work of the technical personnel) is ideally pushed into the background. If it is commonplace to distrust the way music is mediated through sound recording and other electronic technology, this may be partly due to unfamiliarity with the ways in which the technology works, and with the mediating role of the technical personnel. There are many inscrutable “black boxes” that process sound, and many of them are hidden from public view. Understanding the ways in which sound is being manipulated is therefore not always obvious.

Similarly, the architectural acoustics of an enclosed space also amplify and modify sound: “We can think of the room as a signal processor inserted between the sound source and the listener, which affects the level, envelope, timbre, and spatial impression of the original sound, rendering it within the context of an acoustic space.”⁹⁵ However, the relationship between architectural acoustics and musical performance has become naturalized because there is a long history in Western societies of performing in enclosed spaces. Architectural acoustics are seldom thought of as artificial or unnatural within the

⁹⁴ Ibid , 343–344.

⁹⁵ William Grant Gardiner, “The Virtual Room” (MS thesis, MIT, 1992), 7.

music community (or indeed even as technology at all). The acoustic properties of the performance space have influenced compositional decisions such as instrumentation and rhythmic patterns in classical music. Blesser and Salter write, “It is clear that the classical music tradition which has evolved in real concert halls, implicitly embraced the rules created by real spaces.”⁹⁶ Acoustics are considered part of the “natural” sound whereas electronic technology is relatively new and its role is still being negotiated, particularly within the classical music tradition where the composition of the majority of masterworks in the canon precedes the invention of sound recording. Perhaps another reason acoustics are not considered “unnatural” is because one can directly experience and interact with the effects of sound in an enclosed space. There is no mediation beyond the physical structure, no “black boxes” to understand (although it takes specialized knowledge to understand the physics and the perception of sound scientifically). One can visually relate the behaviour of sound to the physical properties of the room (i.e., size, shape, physical materials, etc.) and interact directly with the effects of the space (e.g., by clapping or singing and listening for the echo and reverb). Again, the sense of direct communication may assuage thoughts of fakery and manipulation.

⁹⁶ Barry Blesser and Linda-Ruth Salter, *Spaces Speak, Are You Listening? Experiencing Aural Architecture* (Cambridge, MA MIT Press, 2007), 159.

Chapter Four: Issues of Authenticity in Classical Music in Relation to Sound Recording Practices

In addition to faithfully re-creating the aesthetic of live performance, classical music recording also negotiates other sites of authenticity: the authority of the score as documentation of the intentions of the composer, historically informed notions about performance practice and authentic sounds, and in some cases, the personal interpretation of virtuoso performers.⁹⁷ Although sound recording is sometimes can be seen as a threat to the future viability of live performance, the aesthetic possibilities inherent in recording technology have not been rejected by the classical world. On the contrary, the capabilities of sound recording technology make it possible to realize performances with unprecedented fidelity to the score, to the vision of the performer, and arguably to historical practices and sounds. Indeed, from a technical perspective, the classical music world has often been at the forefront of new research and development in audio technology, as we have seen.

This chapter discusses how notions of authenticity guide and legitimize the use of technology for representing classical music on sound recordings, and how making and listening to recordings has altered performance practices. The impact of recording on performance practices shows that the live and the mediatized have become blurred in this genre as well, despite the strong tradition of performing acoustically in concert venues. I structure this chapter using Kivy's four sites of authenticity in classical music, and relate them to the recording issues at hand:⁹⁸

⁹⁷ These notions of authenticity are derived from Peter Kivy, *Authenticities Philosophical Reflections on Musical Performance* (Ithaca, NY: Cornell University Press, 1997).

⁹⁸ Kivy, *Authenticities*

- i) authenticity to the intention of the composer
- ii) authenticity to the historical sound (sonic authenticity)
- iii) authenticity to the historical performance practice
- iv) authenticity to the personal interpretation of a score (personal authenticity)

Authenticity to the Intention of the Composer

The score has arguably been the primary locus of authenticity for most of the classical music tradition, and the capabilities of sound recording technology make it possible to realize the composer's notated intentions with unprecedented "accuracy." Multiple takes can be recorded and carefully analyzed, preferred sections can be edited together, tuning problems can be fixed after the fact, individual instruments can be highlighted and the overall balance adjusted through microphone placement techniques. Recording opens up numerous possibilities for realizing the score that are not possible live. In some instances, recordings have more accurately realized the score than live performances. Consider, for example, John Culshaw's 1959 production of Wagner's *Ring* cycle. Edward Greenfield describes how this recording "set the seed for what in effect was a new concept in recording as an artform distinct from live performance."⁹⁹ Culshaw brought together a star-studded cast, the gathering of which would likely not have been financially or logistically feasible for a live performance. He also followed score instructions that were seldom heeded live, such as having the requisite eighteen anvils and the steerhorns (alternatively played by the trombones).¹⁰⁰ Greenfield praises this recording for realizing the composer's intentions as expressed in the score:

⁹⁹ Edward Greenfield, "The Art of Culshaw," *Gramophone*, 1980, 25.

¹⁰⁰ The performance was conducted by Georg Solti and the cast included Brigit Nilsson, Hans Hotter, Gottlob Frick, Wolfgang Windgassen, Dietrich Fischer-Dieskau, Regine Crespin, and Joan Sutherland. See John Culshaw, *Ring Resounding*.

It was thanks to Culshaw's devotion to Wagnerian intentions – ever encouraged by the engineer who was at his right hand through the whole project, Gordon Parry, himself a devoted Wagnerian – that in the Solti Ring cycle one is able to hear the scores in a way literally impossible in the theatre. Siegfried's voice made to sound like Gunther's, the voice of Fafner from his cave, not to mention the splendour of anvils and rainbow bridge harps in Rheingold, all transcend what is heard in the opera-house. It was characteristic of Culshaw that he went to such lengths to get steerhorns for *Götterdämmerung* that were totally authentic.¹⁰¹

Culshaw's approach to the *Ring* cycle involved considerable technical intervention, including the then-new spatial possibilities of stereo. However, in this instance the technology is not seen as somehow falsifying or debasing the music because the recording is faithful to the intentions of the composer. Culshaw outwardly aligns his values with the classical music tradition by stating that the role of technology is to serve the music:

Like any other medium, stereo can be abused; and once it begins to draw attention to itself and away from the music it serves, something can reasonable be said to have gone wrong—not with stereo as such, but with the way in which it is being handled.¹⁰²

Furthermore, he claims that whether or not technology “serves the music” is a matter of *how* it is applied, and reassures that, as a technician, realizing the music is his primary concern. Culshaw admits to some creative signal processing, but insists that to keep the technology in the background, basic spatial cues should be familiar and stable: “The fact is that an abnormal acoustic cannot be sustained for long without inducing aural fatigue, and a hint is enough to convey the point you are trying to make.”¹⁰³ Although many aspects of the production could not have been realized live, the opera house experience is apparently still the reference point for the overall aesthetic.

¹⁰¹ Greenfield, “The Art of Culshaw,” *Gramophone* (1980): 25.

¹⁰² Culshaw, *Ring Resounding*, 25.

¹⁰³ *Ibid.*, 25.

Authenticity to Historical Sounds and Performance Practices

The rise of historical musicology as a scholarly discipline in the twentieth century contributed to the movement toward historically informed performance practice. As Richard Taruskin has noted, while these performances can be novel and enjoyable, it is misleading to think of them as historically accurate or authentic: “The claim of reviving the past is actually a way of being original in today’s world of music.”¹⁰⁴ As an audience member we cannot expect to hear (much less interpret) a piece of music today in the same way it would have been received by an audience in the past. Indeed, Taruskin argues that the preoccupation with historically informed performances is actually a reflection of the values and the tastes of modern audiences.

Theodor Adorno critiqued the “purist” desire for historically authentic performances thirty years earlier than Taruskin in a well-known essay titled “Bach Defended Against His Devotees.”¹⁰⁵ The common belief among such “devotees” is that the true essence of the music will be revealed through an ascetic devotion to the details of the score and to other historically relevant information.¹⁰⁶ Where does one draw the line for reproducing historically informed aspects of a performance? Should the musicians dress in period clothes? Decisions inevitably have to be made about how closely historical information is followed. Philip describes how factors other than historical “accuracy” influence these performances.¹⁰⁷ One dilemma concerns whether or not to use exact replicas of period instruments (and deal with the challenge of learning to play them

¹⁰⁴ Richard Taruskin, *Text and Act: Essays on Music and Performance* (Oxford: Oxford University Press, 1995), 176

¹⁰⁵ Theodor Adorno, “Bach Defended Against His Devotees,” in *Prisms* translated by Samuel and Sherry Weber (Cambridge, MA: MIT Press, 1983, c1967), 133–146

¹⁰⁶ Robert Philip, *Performing Music in the Age of Recording* (Yale University Press, 2004), 215

¹⁰⁷ *Ibid.*, 216

proficiently and in tune) or to use modified period instruments that are more suited to modern playing techniques, concert venues, and aesthetic tastes. For a recording project, the financial benefits of using instruments with modern modifications might outweigh a desire to play on more “authentic” replicas because it takes significantly more studio recording and editing time to make period instruments sound in tune on the recording if they are continuously falling out of tune in performance.¹⁰⁸

Sound recordings played an important role in the success of historically informed performance. The most recent vogue for early music gathered strength in the 1950s and reached its height in the 1970s. It came into prominence and exerted widespread influence primarily through the proliferation of sound recordings. When asked on a BBC radio programme about the importance of sound recordings, period violinist Simon Standage replied, “Would the whole [early music] movement have succeeded without recording? I doubt it. If orchestral sounds have changed, it’s because of the constant bombardment of recordings. A concert series here or there wouldn’t have had the same effect on public taste.”¹⁰⁹ Although period performers have become more proficient on their instruments, early music recordings have been notorious for being heavily edited to bring the performance up to current technical standards. Philip writes:

Although standards have generally risen in the last twenty years, editing still disguises a great deal. A producer who specializes in recording early music said in conversation recently that he was about to record some virtuoso twentieth-century piano music ‘for a change’. It would, he said, involve much less editing than most of his early music records, even though the music was far more complicated. When the reaction to this was surprise, he explained, ‘Nobody goes into a studio to record virtuoso piano music without being sure that they can play it.’¹¹⁰

¹⁰⁸ *Ibid.*, 216

¹⁰⁹ In interview with Andrew McGregor, *CD Review*, BBC Radio 3, Saturday 28 October 2000

¹¹⁰ Philip, *Performing Music in the Age of Recordings*, 218.

This is a case where considerable technical intervention is acceptable because the end result is ostensibly authentic to the historical sound and practice—two notions of authenticity that Kivy identifies. Philip’s remarks also insinuate that some early music performers cannot reproduce their recorded “performance” live. Although the producer’s frustration obviously stems in part from the extra work (e.g., extensive editing) involved in making early music recordings, there is still a sense in which being unable to reproduce the performance on the recording live is dishonest and inauthentic. There is a conflict here between two notions of authenticity. On one hand, recording technology makes it possible to realize an early music performance on period instruments that is arguably authentic to the historical sound and practice. On the other hand, being unable to perform a piece of music without the aid of technology is considered somehow inauthentic in classical music culture. Nevertheless, it can be argued that crafting an “ideal” early music recording—one that is note-perfect and in tune—is actually a very modern aesthetic goal and performance practice. Philip’s work suggests that striving for technical perfection has largely been a twentieth-century obsession.¹¹¹

Personal Authenticity and the Case of Glenn Gould

For Taruskin, historically informed performance cannot be authentic to the historical sound and practice, however Kivy’s notion of personal authenticity offers a slightly more nuanced perspective. Neither Taruskin nor Kivy begrudge the way historical information can enhance the enjoyment of a musical work or inspire novel performances. What is problematic is the notion that these performances are accurately re-creating historical sounds, and that it is possible to hear music in the same way as an audience of the past

¹¹¹ Ibid., 13.

would have heard it. Following the public critique of Taruskin and others, musicians and conductors have distanced themselves from the rather naïve idea of historical authenticity. In its place, they seem to have re-focused their discourse around the notion of personal authenticity:

There was a time when ‘authenticity’ was the motto of much of the Early Music movement. But when musicians use the word today, it is usually to distance themselves from such a simplistic notion. Nikolaus Harnoncourt said in an interview in 1993, ‘For me, authenticity is ridiculous. If Mozart performs one of his piano concertos himself, this is authentic. My performance is authentic me; I cannot give an authentic performance of any composer.’¹¹²

In a recent article in the *New York Times*, Nicholas Kenyon claims that the emphasis on historically informed performance has shifted away from historical sounds and practices, and become focused on the conductor’s personal interpretation:

The emphasis here is shifting onto the conductor and his interpretive style rather than the instruments. When the conductor Ivan Fischer presented his fascinating Beethoven symphony cycle in New York last spring, split between the modern-instrument Budapest Festival Orchestra and the Orchestra of the Age of Enlightenment, it was his powerfully individual approach to the music, rather than the instruments that were used, that shone through all the concerts and gave the series its character.¹¹³

Although the discourse has changed, if at one time period performers were in some sense denying authorship of their interpretations, the foil to this is Glenn Gould who was forthright about interpreting classical scores according to his personal vision. Borrowing Taruskin’s words, Gould was not an “impartial arbiter” or “curator” of the classical repertoire.¹¹⁴ Gould did not feel constrained by extra-notational markings, historical information, or the alleged intentions of the composer. This is partly because

¹¹² Ibid., 219.

¹¹³ Nicholas Kenyon, “Early Music is Enjoying Its Moment,” *New York Times*, March 6, 2011, AR16.

¹¹⁴ Taruskin, *Text and Act*, 169–71.

his understanding of music was idealistic at its core.¹¹⁵ He believed that music is atemporal and ahistoric—that it ultimately transcends reality—and this viewpoint gave him confidence and license to interpret the score as he saw fit. He was primarily interested in musical structure, and by his standards, the amendments he made to the score enhance the unity and clarity of the structure, although many of his interpretations were considered to be highly unorthodox.¹¹⁶ Gould understands the performer's role as creative.¹¹⁷

Unlike most classical performers of his time, Gould embraced sound recording to realize his vision. Recording technology allowed him to transcend the limitations of real-time performance and to express himself musically without concertizing (a practice he predicted would become obsolete and which he ultimately abandoned in favor of making records). He praised recording technology for enabling both composers and performers to fully realize their artistic vision.¹¹⁸ For Gould, sound recording enabled the notion of personal authenticity.

Blurring the Live and the Mediatized: Phonographic Effects in Classical Music Performance

The live and the mediatized may not be as obviously blurred at a typical live classical music concert as it is for many popular music performances. But making and listening to recordings requires different listening and playing techniques, from both performers and

¹¹⁵ Kevin Bazzana, *Glenn Gould The Performer in the Work* (Oxford: Oxford University Press, 1997), 14, 37.

¹¹⁶ *Ibid.*, 37; Glenn Gould, "Let's Ban Applause!" *The Glenn Gould Reader*, ed. Tim Page (New York: Knopf, 1984), 246.

¹¹⁷ Bazzana (among others) suggests that Gould's limited success as a composer causes him to pour his creative energy into performance, and that this partly accounts for his conception of the performer's role as creative. See Bazzana, *Glenn Gould The Performer in the Work* and Otto Friedrich, *Glenn Gould A Life and Variations* (New York, Random House, 1989)

¹¹⁸ Glenn Gould, "Let's Ban Applause!" 246.

listeners, which over time affects how classical musicians perform live, and what audiences expect. Mark Katz calls this phenomenon the *phonographic effect*:

A phonographic effect is any change in musical behaviour—whether listening, performing, or composing—that has arisen in response to sound-recording technology. A phonographic effect is, in other words, any observable manifestation of recording's influence.¹¹⁹

Through analysis and comparison of recordings, Philip observes an overall rise in technical proficiency and a gradual loss of diversity between orchestras in the twentieth century, phenomena that could be described as phonographic effects.

Philip remarks that the modern-day emphasis on technical perfection was not present in the early twentieth century, and that the majority of performances a century ago would be deemed amateurish by present-day standards:

Early recordings make it clear that standards of accuracy, tuning, clarity, and precision were generally lower in the early twentieth century than they are today, and there is no reason to suppose that they were higher through the nineteenth century.¹²⁰

He contends that sound recordings have been a central causal factor in the escalating demand for technical perfection. According to Philip, escalating technical standards gradually change the level of professionalism and discipline expected from orchestras. He cites numerous examples from the early twentieth century that point to a general lack of proficiency and a lack of rehearsal that produced results that were inconsistent and unpolished compared to twenty-first century standards:

The Queen's Hall Orchestra was often praised for its performances from the 1890s through to its absorption into the new BBC Symphony Orchestra in 1930. But the standard it achieved was, to judge from its recordings, still far from the standards we are use to in the twenty-first century.¹²¹

¹¹⁹ Katz, *Capturing Sounds*, 2.

¹²⁰ Robert Philip, *Performing Music in the Age of Recording*, 13.

¹²¹ *Ibid.*, 65.

Philip describes the British and French orchestras of the early twentieth century as particularly lax, partly due to inconsistent membership.¹²² Although orchestras in Vienna, Amsterdam, and Berlin had more regular membership and were better rehearsed, Philip claims that in the late 1920s, the highest quality orchestras were in the United States—particularly the Philharmonic Symphony of New York under Toscanini:

The precision of Toscanini's orchestra was unlike anything to be heard in Europe at his date [ca.1930]. By comparison, Stokowski's Philadelphia Orchestra and Koussevitzky's Boston Symphony also had great power and conviction, but details were sometimes as casually placed as in European playing [...]. When the NBC Symphony Orchestra was founded for Toscanini in 1937, it was widely described as the finest orchestra yet formed.¹²³

Matching the standards set by top orchestras such as the NBC Symphony required more discipline from the orchestra and from individual players. Hearing these orchestras perform live undoubtedly had an impact, however Philip claims that the ease with which sound recordings circulate is at least partly responsible for the rapid increase in orchestral technical proficiency. The expectation for accuracy and attention to detail became even higher with the advent of more sophisticated recording techniques:

Now the expectation is that everything will be neat and tidy, whatever the standard of music-making in other ways. This is the result partly of the general drive towards accuracy and clarity, which has been fed by the artificial perfection of highly edited modern recordings, partly of the changing role of the conductors.¹²⁴

The emphasis on technical proficiency—a phenomenon that escalated quickly with the proliferation of sound recordings—has led to orchestras that are highly skilled and disciplined. The ability to listen back, and listen repeatedly to a recording gradually alters performers' (and the audiences') expectations. Philip maintains that being able to

¹²² British and French orchestras operated under the “deputy system” where it was common for players to send replacements to rehearsals or concerts if they were offered a higher paying job.

¹²³ Robert Philip, *Performing Music in the Age of Recording*, 76

¹²⁴ *Ibid* , 87.

scrutinize one's performance after the fact causes many performers to become highly self-critical and obsessive about the finer details of their performance. Furthermore, the exercise of crafting an idealized performance in the recording studio—of doing multiple takes and honing each section—becomes a habit that extends to the concert hall. As recordings gradually become the main source of music for Western listeners, and as audiences become accustomed to the high technical standard of recorded performances, this general aesthetic orientation spills over into the concert hall and the same level of technical proficiency is expected from live performance.

Philip also notices a gradual homogenization of playing styles in the twentieth century. Compared to early recordings, modern tastes tend to favor a blended sound where one cannot readily pick out individual players or instruments. For example, he finds large discrepancies in the sound of the woodwinds in French, German, and British orchestras on recordings from the 1920s and 1930s.¹²⁵ In France, the distinctive nasal sound of the French bassoon, the reedy tone of the clarinets, and the considerable use of vibrato stand out against the rest of the orchestra. The sound of the woodwinds in German orchestras was darker, smoother, and without much vibrato. In contrast, the British orchestras used French bassoons, wooden flutes (the French used metal), and very little vibrato. The woodwinds stood out in French and British orchestras, whereas the timbre of the German woodwinds tended to blend more readily with the brass and strings: “The woodwind sound, both in Berlin and in Vienna, was steady and broad, with the instruments tending to blend together in ensemble in a more organ-like way than in France or Britain.”¹²⁶ He hears a synthesis of different European styles in recordings of

¹²⁵ Philip, *Performing Music in the Age of Recording*, 92–94.

¹²⁶ *Ibid.*, 94.

American orchestras from the 1920s and 1930s, and considers this fusion to be the basis of the modern orchestral sound. Listening to recent orchestral recordings, Philip claims the blending of styles that first coalesced in American Orchestras has resulted in a gradual erasure of national and regional styles that makes it difficult today to distinguish the sound of one orchestra from another:

By the end of the twentieth century, this sharing round of diverse styles had coalesced into a level of homogenization that could never have been dreamed by Furtwängler and his contemporaries. In the first half of the twentieth century orchestras in different countries sounded quite different from each other. By the end of the century it was difficult to tell where an orchestra was from, just from its recordings...there are still orchestras that have distinct characteristics of their own, but the differences are narrowing all the time.¹²⁷

To Philip, the flattening of specificity within the orchestra, and between orchestras gives them a machine-like quality: “The orderly, smooth blended sounds of the modern orchestra, in which everyone moves neatly and apparently effortlessly together, has become more machine-like and less obviously human than it used to be.”¹²⁸ He is not claiming that sound recordings are *solely* responsible for the trend towards homogenization in orchestral sound, however he makes a strong case that the ability to perfect a performance on a recording, and the ease with which recordings circulate undoubtedly contributed to the rapid changes in orchestral style and professionalism over the last century.

Although classical sound recordings might threaten the historical role and viability of live performance, neither musicians nor audiences have followed Glenn Gould out of the concert hall in the way he predicted.¹²⁹ Live performance is still central to the classical music tradition. Because sound recording and live performance are

¹²⁷ Ibid., 95.

¹²⁸ Ibid., 103.

¹²⁹ Tim Page, “Coda: Glenn Gould in Conversation With Tim Page,” *The Glenn Gould Reader*, 451.

essentially two distinct art forms that offer two different experiences of music, Culshaw claims that they should be able to enjoy a happy coexistence: “My feeling is that since stereo offers an *entirely different* experience, or should do, there is no reason on earth why the two should not exist happily, side by side, for many years to come.”¹³⁰ However, the truth is that sound recording and live performance have neither existed in isolation from one another, nor coexisted peacefully. On one hand, making and listening to recordings has changed performance practices, altered the audience and performer expectations, and transformed the social relationships in which various agents of classical music culture participate. On the other hand, classical recordings are expected to be modeled on live performance, and faithful to notions of authenticity in which the classical music tradition is steeped. Recordings that deviate from these ideals tend to be marginalized.¹³¹ Auslander contends that the live and the mediatized cannot live in isolation from one another, and this seems to hold true even for classical music, a tradition that strongly values live performance, and continues to train musicians primarily for its demands.¹³²

¹³⁰ Culshaw, *Ring Resounding*, 27.

¹³¹ Symes, *Setting the Record Straight*, 7.

¹³² Auslander, *Liveness*.

Chapter Five: Spatial Fidelity in Classical Music Recording

Re-creating an original musical event involves the representation of sources and their environments. Because there has been an intersection between architectural acoustics and the classical music tradition, sound engineers and producers have had to consider the way acoustic spaces are represented on recordings. Acoustic spaces have been represented differently according to technological and cultural circumstances. The dry aesthetics of early recordings were shaped by the influence of radio communications and the limitations of sound recording technology. When it became possible to record the sound of the room, sound engineers and researchers became preoccupied with the representation of space. There has been a general progression in audio technology from single-channel representations of sources and spaces (monophonic), to two-channel representation (binaural and stereophonic), to multichannel representation (quadraphonic and multichannel).¹³³ Evidence suggests that this progression has largely been guided and focused by the requirements of *classical* music recording. Sound engineers and producers have been early adopters of new spatial audio technologies. This chapter looks at the shift from the dry, direct aesthetic of recordings in the early half of the twentieth century, to the increasing preoccupation with spatial acoustics mid-century, to a very recent and innovative recording novelty, the *Virtual Haydn* project conducted by McGill University researchers, where the use of convolution reverb to map and digitally simulate physical spaces adds another layer of fidelity to classical music recordings by purportedly making

¹³³ Multichannel systems are still technically stereophonic in that they only create the illusion of dimensionality. This is explained in more detail on page 68.

it possible to listen to a performance in an original (albeit virtual) historically-appropriate venue.

Privileging the “Direct Sound” in Early Recordings

The “direct sound” is the sound of the musical acoustic source (an instrument, a voice, etc.) without any trace of its environment. Blesser and Salter describe several social, political and technological reasons for the preference for direct sound in the early to mid-twentieth century.¹³⁴ As industry intensified in the early twentieth century and new technologies such as the automobile were introduced, the noise pollution from mechanical and industrial sources became a constant background to urban life.¹³⁵ Concern over the negative health effects of noise spurred an interest in taming public noise levels through legislation and noise reduction technologies. Professional organizations such as the Acoustical Society of America (1928) were founded and there was an increase in design and manufacturing of soundproofing materials to dampen the noise in interior spaces. Hearing an isolated sound source against a silent background was becoming the mark of high quality audio:

The mantra ‘absorb and remove all sound’ became the prevailing response to high noise levels. Society was redefining sound quality as pure and direct sound without any influences from the environment. Echoes, reverberation, and resonances were all viewed as a kind of amplified noise.¹³⁶

Noise reduction was also a major issue for early sound recording technology. The first phonographs were noisy and inefficient. Musicians and singers often had to sing with their heads inside the acoustic recording horns to compete with extraneous sounds from the machines and the environment to improve the signal-to-noise ratio. Early

¹³⁴ Blesser and Salter, *Spaces Speak*, 108.

¹³⁵ *Ibid.*, 108.

¹³⁶ *Ibid.*, 108.

microphones were also noisy and getting a clear, loud signal was a challenge. Close-miking became the main technique given the limitations of the technology and the desire to maximize the direct sound. Microphones were placed close to the sound source to pick up only the direct sound. Radio and recording studios were soundproofed and their walls, floor and ceilings were acoustically treated to minimize any extraneous sounds and transmit a clear signal.¹³⁷ The acoustically “dry” (or non-resonant) sonorous aesthetic of radio broadcasting influenced the aural architecture of new venues such as the Chicago Civic Opera (1922) and Radio City Music Hall (1932) whose reverb times were considerably less than those thought desirable in concert halls of the nineteenth-century.^{138,139} These less reverberant halls were built with amplification systems in mind. Ideally, the sound onstage would be communicated as directly as possible to the audience through loudspeakers without interference from the architectural acoustics. This idea informed many aspects of the design of Radio City Music Hall, which had a low reverb time and used an amplification system to transmit the sound onstage to the audience:

[Roxy Rothafel, the director of Radio City Music Hall] was confident that acoustic experts had created a space as ideal as possible for sound *transmission*, and that the electroacoustic amplification was so perfect that listeners would not be able to detect its existence. The artistic and aesthetic function of reverberation in enclosed spaces was now replaced with “cleaner” electroacoustics.¹⁴⁰

¹³⁷ An exception should be noted that for live broadcasts, microphones were often placed above the audience to deliberately pick up sounds from the crowd to give radio listeners the feeling of actually being in the studio. Blesser and Salter make an interesting point that this was not to capture a sense of the acoustic space, but to capture human sounds such as coughs and shuffling feet, which were considered signs of life, as opposed to reflected sound which was considered unwanted noise (Blesser and Salter, *Spaces Speak*, 121)

¹³⁸ Dry acoustics are generally considered to be halls with a reverb time of less than 1.4 seconds. See Leo Beranek, *Concert Halls and Opera Houses: Music, Acoustics and Architecture* (New York: Springer-Verlag, 2004, c1996), 498

¹³⁹ When it opened, Radio City Music Hall was estimated to have a reverb time of less than one second (Blesser and Salter, *Spaces Speak*, 110)

¹⁴⁰ *Ibid*, 110

This description of the Hall's amplification system also demonstrates how the sought-after ("perfect") technology was expected to be transparent and neutral. The latest technical innovation promised to deliver to the listener the most accurate and high quality sound of the performance without interfering at all in the transmission. Suppressing the room acoustics and using amplification also places sound under human control and makes it possible to distribute it more evenly throughout the room. Thus, another virtue of this technology is a sense of mastery over the behaviour of sound, and the possibility of realizing a more democratic distribution.¹⁴¹

Another important feature of the direct sound approach is that it creates a sense of intimacy between performer and listener. "With their weak reverberation and strong intimacy, acoustically dry spaces were judged favorably by the standards of their time."¹⁴² The idea of intimacy through technology is a recurring theme that is discussed in several well-known works on media and communication. In his landmark essay "The Work of Art in the Age of Mechanical Reproduction," Walter Benjamin suggests that we have a somewhat contradictory desire for proximity to an art object. People desire closeness to the point where they are willing to destroy its uniqueness—its "aura"—in order to access it through reproduction:

The desire of contemporary masses to bring things "closer" spatially and humanly, which is just as ardent as their bent towards overcoming the uniqueness of every reality by accepting its reproduction. Every day the urge grows stronger to get hold of an object at very close range by way of its likeness, its reproduction."¹⁴³

¹⁴¹ Blesser and Salter, *Spaces Speak*, 111.

¹⁴² *Ibid.*, 111.

¹⁴³ Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction," in *Illuminations* (New York: Harcourt, Brace & World, 1968).

John Durham Peters echoes some of Benjamin's ideas when he discusses modernity's (and post-modernity's) fascination with media and the perennial hope that it will bring others physically and humanly closer: "'Come here, I want you,' said Bell to Watson in the first telephone call, and this utterance is the symbol and type of all communication at a distance—an expression of desire for the presence of the absent other."¹⁴⁴

Sterne takes this idea a step further and suggests that this *eros*—the longing to connect with distant others—also extends from people to machines.¹⁴⁵ Concerning fidelity, Sterne claims that there is a similar longing for machines that can faithfully reproduce messages (e.g., phone, email, fax, text-messaging, etc.). The desire is strong enough for people to “help” the machines accomplish this task. For example, in the early days of sound reproduction, people “helped” the machines work by using clichéd language that was easy to remember for experiments and public demonstrations:

Edison's famous test quote [Mary Had a Little Lamb] was again language easily remembered and easily understood...in addition to public demonstrations and famous firsts, experimentation with sound reproduction largely had the machines reproducing easily remembered and imitated language...any kind of banal speech would (theoretically) have served this function. By the use of clichéd and conventionalized language, early “performers” of sound reproduction helped listeners help the machines reproduce speech.¹⁴⁶

The sound of these early machines would almost certainly not have been as immediately intelligible as the proclamations from public demonstrations suggest. As Sterne writes, learning how to decipher messages through early sound reproduction machines actually took practice: “certainly, these early sound-reproductions were barely understandable in

¹⁴⁴ John Durham Peters, *Speaking into the Air: A History of the Idea of Communication* (Chicago: Chicago University Press, 1999), 180

¹⁴⁵ Sterne, *The Audible Past*, 251

¹⁴⁶ *Ibid.*, 250–251

most cases, and any practical use would take considerable practice.”¹⁴⁷ In other words, people met the machines halfway—they bridged a gap in communication because they desired the machines to work in this particular way: “practice met intelligibility halfway.”¹⁴⁸

Through exposure to (and marketing of) records and radio broadcasts, direct sound became associated with higher sound quality and the public gradually accepted this dry aesthetic as the mark of accurate and precise sound reproduction. One particular marketing technique that helped shape this attitude was the “tone test” that peaked in popularity in the 1920s. A singer and a recording were placed behind a curtain and the audience guessed which performance was real and which was recorded. In order for the recording to be indistinguishable from the singer, it had to be dry—extra reverb, echoes, or resonances would not sound like the live singer. Popular with audiences, these tests validated the idea that dry recordings were “precise” or “accurate” in their likeness to the real thing. A more recent and memorable version of this idea is the advertizing campaign launched in the early 1970s by Memorex to sell their cassette tapes, which employed the famous slogan “Is it Live, or is it Memorex?”¹⁴⁹

To summarize, the main technological challenges for sound recording during what is commonly known as the “acoustic period” were to reduce noise and to achieve a loud enough sound to mechanically cut a record. Perhaps the desire to maximize the direct sound and suppress background noise also reflected a broader social concern with reducing public noise levels. Electroacoustic space was a way of shutting out the noisy

¹⁴⁷ Ibid , 255

¹⁴⁸ Ibid , 255

¹⁴⁹ John Mowitt, “The Sound of Music in the Era of Its Electronic Reproducibility,” in *Music and Society The Politics of Composition, Performance, and Reception*, eds Richard D Leppert and Susan McClary (Cambridge Cambridge University Press, 1987), 174

public sphere by separating sounds from their social and historical contexts. Radio exemplified this idea, and the dry aesthetic of broadcasts even began to influence the design of concert venues. Spatial acoustics were thus not seen as part of the “original” or ideal sound. While this may have chiefly been due to technical limitations, the discourse that ensued sung the praises of a dry, direct sound and this gradually became understood as the mark of “high-fidelity” and precision reproductions. If echo and reverb provide cues about a particular “space” and “place,” one way to interpret the removal of these elements might be as an attempt to create a kind of idealized, pure, objective ahistorical and unsituated experience of “absolute sound”—perhaps similar to the way so-called “absolute music” ostensibly strives to transcend its social and historical context. For the first half of the twentieth century, direct sound stripped of its acoustic context was widely considered to be the “original” or “accurate” sound. This aesthetic trend was in many ways the result of technological limitations, the advent of radio, a broader public agenda of noise reduction, and the novelty of bridging physical distance by connecting directly with others through the new electronic media.

Recording Spatial Acoustics

The general preoccupation with the “direct sound” ideal changed within a few decades. Blesser and Salter cite the English acoustical architects Hope Bagenal and Alex Wood as among the first to challenge the idea that dry recordings were the most precise and authentic reproductions.¹⁵⁰ In the early 1930s, they (and others) began to reason that music is often written for specific acoustical spaces and that this should be reflected in the recording. For example, Bach’s organ works would sound relatively dull and lifeless

¹⁵⁰ *Ibid.*, 116.

without the long reverb times of the large stone churches and cathedrals for which they were conceived. For live performance, the aural aesthetics of eighteenth- and nineteenth-century concert halls were still exerting influence, even though dry recordings had become accepted as the most accurate and high quality reproductions. Newer venues may have catered to the new aesthetics of radio and recording, but the listening public still attended performances in older concert halls and musicians and conductors were used to responding to the longer reverb times of these venues. The acoustics of nineteenth century concert halls were still a reference point for live music, particularly for the classical repertoire of that era.

Around 1925, the switch to electrical recording and new microphones markedly improved sound quality and opened up new possibilities for sound recording. Electric amplification helped solve the problem of achieving a loud enough sound and it was possible to pick up some room ambience with microphones. Even though an interest in recording the spatial acoustics was gradually emerging, this was still a technical challenge in the 1930s and 1940s:

Recording natural acoustics was difficult if not impossible; artificial reverb was primitive and inadequate; commercial recording enterprises could not afford to build high-quality reverberant spaces; and the listening public was already educated to consider deadened acoustics as synonymous with quality.¹⁵¹

As sound recording technology improved, however, whether or not to record the room ambience or add artificial reverb became a technical and aesthetic question.¹⁵² It gradually became acceptable to hear classical orchestral recordings with room ambience because microphones placed at a distance to pick up large ensembles inevitably picked up the reflected room sound as well.

¹⁵¹ Ibid., 116.

¹⁵² Peter Doyle, *Echo and Reverb*, 57.

The popular music recording industry was more adventuresome in experimenting with artificial reverb and other techniques. Perhaps this was because, as Peter Doyle contends, pop music was generally denied access to the acoustic venues that produced the kind of grandiose spaciousness that was heard on classical recordings. To Doyle—who is interested in affective response to echo and reverb, and the meanings that become attached to the sound of particular spaces—the fact that classical recordings were given spacious reverb, especially at a time when it was expensive to do so, reinforced its status as high art. Furthermore, in Western civilization, prior to the era of the large public concert hall, long reverb times were associated with places of worship such as cathedrals and cavernous natural spaces. Blesser, Salter and Doyle all suggest that the sound of long reverb times has come to signify an event that demands reverence, and therefore attaching it to classical music may have been a way to subconsciously lend that music an aura of profound significance and quasi-religious status. In contrast to Doyle, Blesser and Salter argue instead that the more adventuresome experimentation with spatiality in popular music in the 1950s was in fact crucial in bringing back into favor the sound of reverb and acoustics in recordings among the general public. Either way, audiences for classical and popular music overlap, and production practices can be influenced by the sound of recordings from a variety of genres.

By the 1950s, acoustics were clearly being viewed as an important part of sound reproduction. This is a significant aesthetic change from a few decades earlier. Edward Canby, a well-known record reviewer and columnist of the period, gives a sense of this change in the *Saturday Review of Records* in June 1951:

Liveness [spatial acoustics] fertilizes musical performance, seasons and blends and rounds out the sound, assembles the raw materials of overtones and

fundamental into that somewhat blurred and softened actuality that is normal, in its varying degrees, for all music. Disastrous experiments in ‘cleaning up’ music by removing the all-essential blur long since proved to most recording engineering that musicians do like their music muddied up with itself, reflected. Today recording companies go to extraordinary lengths to acquire studios, churches, and auditoriums, (not to mention an assortment of artificial, after-the-recording liveness makers) in order to package that illusively perfect liveness.¹⁵³

To summarize, the switch to electrical recording in the 1920s made it possible to capture the room sound and give more depth to recordings, and technological changes in the 1930s and 1940s opened up radical new possibilities for sound recording. The dry aesthetic in recording was challenged given the history of live performance in more reverberant spaces and the new possibility of representing spatial acoustics on record. Experiments with spatial acoustics and artificial reverb in popular music recordings may have also brought a renewed interest in spatiality to the general listening public. Notably, as Canby points out, musicians *like* performing in reverberant spaces. An article in the centennial issue of the *Journal of the Audio Engineering Society* gives a concise retrospective of the change in recording aesthetics mid-century:

Throughout the past, strongly damped studio rooms and close-up miking were regular practice. No acoustic ingredients of any substantial kind are detectable in the piles of recordings made prior to around 1925. This practice continued for some years even with the better dynamic microphones, until gradually, encouraged by experiments in real concert halls, an appreciation of the beauty of the acoustic environment developed and was, occasionally, given a faint chance to participate.¹⁵⁴

Close-miking techniques, and the dry aesthetic of early recordings create for the listener the effect of having a performance brought into their listening environment, while re-creating spatial acoustics creates the effect of being transported into the environment of the performers. The novelty of the dry aesthetic is perhaps the illusion of bringing

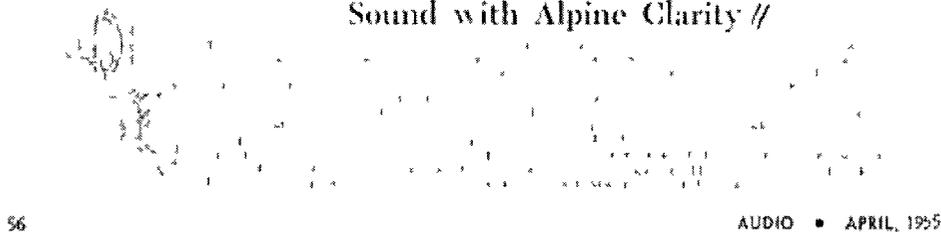
¹⁵³ Read and Welch, *From Tin Foil To Stereo*, 379.

¹⁵⁴ Peter K. Burkowitz, “Recording, Art of the Century?” *The Journal of the Audio Engineering Society*, Vol. 25, No. 10/11 (1977): 875.

distant others closer and affecting intimacy, whereas the illusion of spatial acoustics promises a virtual escape from one's environment into an imagined space. Keir Keightley remarks how discourses in the 1950s on escaping reality through "high-fidelity" recordings are reminiscent of later discourses on escaping reality through psychedelic drugs.¹⁵⁵ Themes of travel and escape are also notable in product advertisements in audio magazines after 1950 (see Figures 3 and 4). The dry aesthetic corresponds to Streicher and Everest's perspective of "they are here," and the reverberant aesthetic corresponds to the perspective "you are there." The digital simulation of real spaces, which is discussed in the next section, may be an endpoint for the "you are there" perspective within the current sound recording paradigm.



Sound with Alpine Clarity //

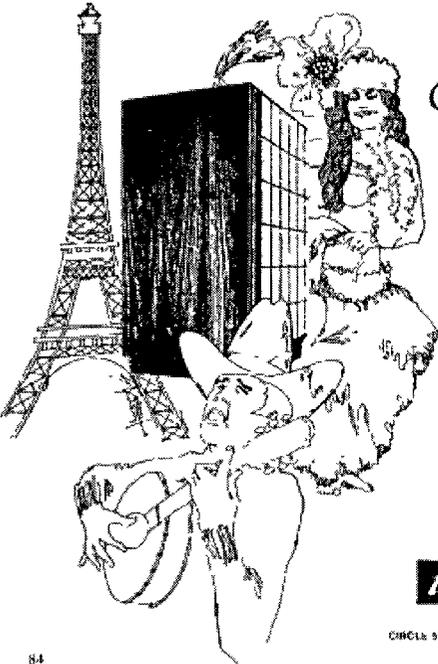


56

AUDIO • APRIL, 1955

Figure 3. Advertisement for Philips of Netherlands loudspeakers in *Audio*, April 1955, 56.

¹⁵⁵ Keir Keightley, "Turn it Down!" She Shreiked Gender, Domestic Space and High-Fidelity, 1948–1959, *Popular Music*, Vol 15, No 2 (1996) 174

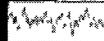


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64 *A. . . 1974* HIGH FIDELITY MAGAZINE

Figure 4. Advertisement for UTAH loudspeakers in *High Fidelity*, June 1974, 84.

The Virtual Haydn: A Case Study of Technology and Authenticity in Classical Music Culture

The Virtual Haydn is a collaborative research project originating from the Centre of Interdisciplinary Research in Music Media and Technology (CIRMMT), a multi-disciplinary group located at the Schulich School of Music of McGill University.¹⁵⁶ The primary researchers are keyboardist/musicologist Tom Beghin, Tonmeister/record producer Martha de Francisco, and virtual acoustics researcher/architect, Wieslaw Woszczyk.¹⁵⁷ The original project title was *Haydn the Orator: A Complete Recording of his Solo Keyboard Music in Simulated Historical Concert Venues*, and is described as follows:

This collaborative research project aims to produce a surround-sound recording of pianoforte music for international release as a hybrid SACD (stereo/surround sound). Two new instruments will be built especially for the project. The recording dates are set for 2005-2008 and the release dates for 2006-2008. The pieces will be recorded in the Recording Studios of the New Music Building. This will be an experimental project. With the use of Wave Field Synthesis, acoustic spaces of Haydn's time will be reconstructed in order to create virtual recording venues where the musician will perform and record. The results will need to withstand critical comparison with any other international commercial CD release of the same works. While the recording sessions will not take place until the academic year of 2006-2007, the phase of planning has started. Research is being done to find historical halls that have a connection with the composer and the practical condition concerning their use as settings for the recordings. Contact is being established with musical acousticians and musicologists in Europe in order to find the most suitable locations for the realization of this recording and research project. A visit to select historical locations in which the composer lived and worked, which may be used as acoustic spaces for the projected music recordings, will take place in June 2005. Venues in Vienna, Austria and Hungary (Esterháza Castle and Eisenstadt) will be visited to search for the most suitable acoustics for each music program (10 in total).¹⁵⁸

¹⁵⁶ "CIRMMT Overview," <http://www.cirmmt.mcgill.ca/about/overview>

¹⁵⁷ These are the titles they give themselves. See Wieslaw Woszczyk, Tom Beghin, Martha de Francisco and Doyuen Ko, "Recording Multichannel Sound Within Virtual Acoustics," *Proceedings of the 127th convention of the Audio Engineering Society*, New York, October 9-12, 2009

¹⁵⁸ "Research Project: Haydn the Orator," http://www.cirmmt.mcgill.ca/research/projects/Haydn_Orator.

A collection of four Blu-ray Discs entitled *The Virtual Haydn: Complete Works for Solo Keyboard* was released on September 28, 2009 on the Naxos Label (Naxos's first Blu-Ray release). The first three discs are audio only, providing the listeners with the choice of either PCM stereo, or DTS-HD Master Audio 5.0 audio formats.¹⁵⁹ The fourth disc consists of a video documentary, video performances, and an interactive program (*7 x 9 matrix: Andante For Musical Clock*). The interactive program allows audiophiles to listen to seven performances in nine rooms, for a total of sixty-three different possibilities.

The Virtual Haydn attempts fidelity to several notions of authenticity in classical music—perhaps more than any classical music recording to date—however, what is novel about this project is its attempt to recapture the sound of Haydn's keyboard music in the “virtual” (i.e., digitally simulated) acoustics of historically relevant spaces. Indeed, the most prominent feature on the front cover of the box set is a photo of a historically relevant space (see Figure 5). The performer and the composer seem to be of secondary importance. This adds another dimension to the quest for authenticity in classical music performance. If one can simulate the acoustics of the *actual* performance space for which a musical work was written, then fidelity to a concert hall experience may seem rather generic, or even inauthentic by comparison. This project draws attention to the influence of aural architecture in composition and performance and questions the authenticity of performing musical works outside the contexts or venues for which they were written. *The Virtual Haydn* proposes a more authentic experience than live performance in a concert hall because it is faithful to the sound of the intended performance spaces. I will first explain the technical dimensions of this project, and then address how this is an

¹⁵⁹ These terms refer to the method of encoding digital data. The use of pulse code modulation (PCM) stereo and Digital Theatre System (DTS-HD) audio formats essentially means that the audio quality on the Blu-ray disc is the same as the studio master, there has been no perceptual compression on the final format

especially unconventional approach to recording classical music. Lastly, I will discuss the project in relation to issues of authenticity in the classical music tradition.

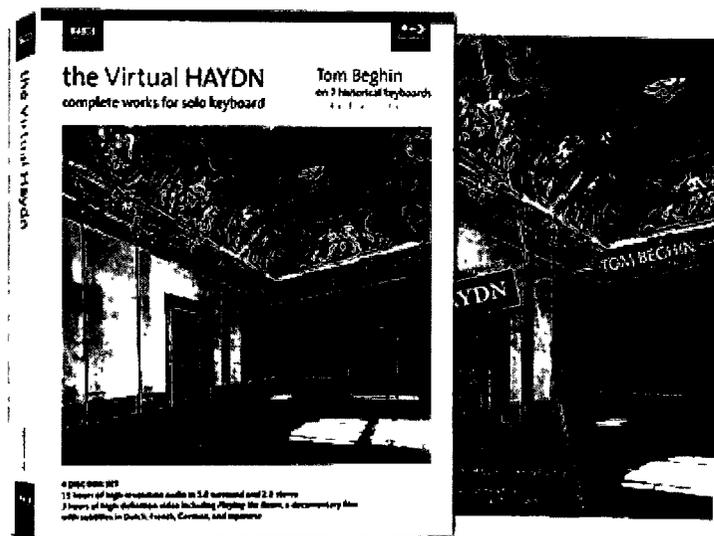


Figure 5. The front cover of *The Virtual Haydn* box set.¹⁶⁰

The Virtual Haydn is both a commercial recording venture and a research project in spatial audio technology. Spatial audio coding is an active area of research in the audio community.¹⁶¹ There are two basic approaches to representing acoustic space using sound recording technology.¹⁶² The first method, which is still highly experimental, creates a truly three-dimensional sound field and allows the listener to move through the recorded space. The second method represents a sound event from a set perspective; it conveys the “essential spatial cues without actually recreating the soundfield itself.”¹⁶³ Research has

¹⁶⁰ Photo retrieved from <http://www.music.mcgill.ca/~beghin/NAXOS.pictures>.

¹⁶¹ See Rumsey, *Spatial Audio*; Davis, “History of Spatial Coding.”; Peter Lennox, Tony Myatt and John Vaughan, “From Surround to True 3-D,” *Proceedings of the 16th International Conference of the Audio Engineering Society*, Rovaniemi, Finland, April 10–12, 1999.

¹⁶² Davis, “History of Spatial Coding,” 554.

¹⁶³ *Ibid.*, 554.

begun on the development of recording and reproduction systems capable of creating true three-dimensional sound fields (such as Wave Field Synthesis).¹⁶⁴ Although Wave Field Synthesis falls into the first category, it has not been widely implemented because it requires a very large number of microphones, channels, and loudspeakers. Stereophonic sound falls into the second category because it creates the illusion of three-dimensional sound sources and environments by relying on the “ability of the human auditory system to create a three-dimensional sonic perception from just the two ear signals.”¹⁶⁵ Although the term is often associated with two-channel audio systems, *stereophonic* technically refers to the illusion of dimensionality and perspective, therefore multichannel systems are also stereophonic. Within the classical music recording tradition, creating a stereophonic sound requires a complex series of decisions whereby sound engineers and producers choose a perspective from which to represent the musical event and its components. While the research team for *The Virtual Haydn* initially intended to use Wave Field Synthesis, ultimately this project falls into the second category and uses a process of “convolution reverb” to create “virtual acoustic environments.”

Convolution is a “mathematical way of combining two signals to form a third signal.”¹⁶⁶ The process of convolution can be used to simulate the characteristics of real spaces and other audio processing systems.¹⁶⁷ Simulation of room acoustics using

¹⁶⁴ The IRCAM homepage for Wave Field Synthesis provides this brief description: “[Wave Field Synthesis] aims at reproducing the true physical attributes of a given sound field over an extended area of the listening room. It is based on Huyghens’ principle (1678) which states that the propagation of a wave through a medium can be formulated by adding the contributions of all of the secondary sources positioned along a wave front.” http://recherche.ircam.fr/equipes/salles/WFS_WEBSITE/Index_wfs_site.htm

¹⁶⁵ Davis, “History of Spatial Coding,” 554

¹⁶⁶ Steven W. Smith, *The Scientist and Engineer’s Guide to Digital Signal Processing*, 2nd ed. (San Diego, CA: California Technical Publishing, 1999), 107.

¹⁶⁷ “Beyond reverberation effects, the IR [impulse response] of any audio processor (microphone, loudspeaker, filter, distortion, effect, etc.) can be convolved with an audio signal to make that signal take

convolution involves a two-step process. First, the room to be simulated is measured: its impulse response is recorded by passing impulses, white noise, or sine waves through a system. Second, the impulse response is convolved with an input signal.¹⁶⁸ Although, digital reverberation employing convolution is not new (commercial reverbs using this process have been available since 2001),¹⁶⁹ *The Virtual Haydn* builds on this concept through the use of multiple microphones to sample historical spaces, and multiple loudspeakers to recreate “virtual acoustic environments” in the studio for the performer. The impulse responses were measured using an eighty-second sine-wave sweep spanning 15Hz to 45kHz, and captured with eight microphones at three different heights (2m, 3m, and 4m), therefore twenty-four responses were measured for each room.¹⁷⁰ *The Virtual Haydn* uses twenty-four channels of reverb from impulse response recordings (that are convolved with the input signals from the keyboard instruments), all the signal processing is done in high-resolution, and it is the first classical music release on Blu-ray.¹⁷¹ This makes it an unprecedented recording from a technical perspective. This kind of technically intense project is not generally feasible for a typical commercial recording.

From a technical perspective, the end product deviated from the proposal in several ways: the project was not released as a hybrid SACD surround sound (it was released on Blu-ray); it was recorded in a small CIRMMT lab, not in the Recording Studios of the New Music Building); it did not use Wave Field Synthesis to construct acoustic spaces (rather, it used the process of “convolution reverb”); and for the actual

on characteristics of the system ” Curtis Roads, *The Computer Music Tutorial* (Cambridge, MA MIT Press, 1995), 419–420

¹⁶⁸ Ibid , 419–420

¹⁶⁹ The first real-time direct convolution reverb product was the Altiverb 1.0 software plug-in. See J. A. Moorer, “About This Reverberation Business ”

¹⁷⁰ Woszczyk et al , “Recording Multichannel Sound Within Virtual Acoustics,” 3

¹⁷¹ Ibid , 3

recording, Beghin interacted with the virtual rooms over headphones (not over in the virtual acoustics, in what they call the “Immersive Sphere”).¹⁷² Arguably, the recordings were not recorded in a virtual acoustic environment; however, Beghin did rehearse using the loudspeaker array: “While the performer rehearsed in the laboratory with full immersive ambience being reproduced over the loudspeakers, for recording we switched to monitoring with headphones in order to retain full flexibility of mixing the ambience later on.”¹⁷³



Figure 6. Tom Beghin seated in the “Immersive Sphere” in the CIRMMT lab at McGill.¹⁷⁴

Classical music sound engineers are accustomed to recording the sound of the instruments and the room together, which makes this project very different from a typical classical recording session: “The challenge of *The Virtual Haydn* was to isolate components of direct and reflected sound before putting these together again using the

¹⁷² Martha de Francisco, “Recording the Virtual Haydn,” *The Virtual Haydn: Complete Works for Solo Keyboard*, liner notes, 61.

¹⁷³ Woszczyk et al., “Recording Multichannel Sound Within Virtual Acoustics,” 6.

¹⁷⁴ Photo retrieved from <http://www.music.mcgill.ca/~beghin/NAXOS.pictures>.

virtual acoustics of the selected historical rooms.”¹⁷⁵ De Francisco describes using ten to fourteen microphones to capture the direct sound of each keyboard, and then adjusting the placement of the microphones in relation to the sound of the different reverbs. Although separating the recording of the direct sound from the room ambience (and optimizing each independently) is considered one of the technical novelties of this project, from an engineering perspective (particularly within the tradition of recording classical music), adjusting the microphone placement to meet the demands of a separate, unalterable digital reverb program is highly unconventional, indeed if not the inverse of most approaches to sound recording. There is no live performance to reference because the instrument and the room are being recorded separately and then blended together. There can only be fidelity to the idea of what the keyboard (recorded in the lab) *might* sound like in the actual room that the digital reverb represents. In many ways, the recording techniques used on this session are more akin to recording popular music than classical: the instruments are close-miked in a less-reverberant room and digital reverb is added separately to the direct signal.

The Virtual Haydn attempts fidelity to the intention of the composer, to historical sounds and practices, and to the sound of historic venues. According to Beghin, Haydn’s compositional process lends itself to such a project because his musical gestures are particularly “rhetorical,” in that they mimic rhythms of speech and conversation, and his compositions were frequently written with specific people, contexts, and technologies (i.e., keyboards) in mind. This idea is reflected in the initial title, *Haydn the Orator*. For

¹⁷⁵ Martha de Francisco, “Recording the Virtual Haydn,” *The Virtual Haydn: Complete Works for Solo Keyboard*, liner notes, 60.

example, Beghin finds stylistic similarities between the sonatas Haydn dedicated to Marie Esterházy and the letters Marie herself wrote to her friends:

I was struck by similarities between Joseph's sonata and Marie's letters. Often Marie's letters start with a celebration of friendship—keen sentimental observations, having to do with the heart and emotion. Then, suddenly, without transition or logic, there's a shift to an informative concluding part: a quick, upbeat and gossipy report of some party or theatre performance. This exact shift—from a long *empfindsam* first part, twice involving variations, to a fast, short, and witty finale—we find in each of the sonatas.¹⁷⁶

He sees numerous affinities between Haydn's musical gestures and the intended recipient and context of a particular composition. Presumably, this project is particularly well suited to bringing the listener and performer closer to hearing the music as Haydn intended, and closer to understanding Haydn's aural experience and compositional process. Seven historical keyboards were ultimately reconstructed specifically for the project.¹⁷⁷ Beghin reports that playing in the different virtual rooms and on historical keyboards noticeably affects his performance style:

The less spectacular acoustics of smaller rooms featuring the square piano did not tempt me to make my gestures unnecessarily grand. Not projecting my sound to some listener "out there," I felt encouraged to play solely for myself, perhaps with a special guest at my side, or a few household members [...] at the other end of the spectrum, the Holywell Music Room demanded a deliberate projection of sound to an audience.¹⁷⁸

By comparing the recordings of his performances with and without the added reverb, he concludes that he clearly performs differently in each of the virtual rooms:

A "dry" version of myself performing in a virtual room indeed sounded more interesting and alive than a version of myself performing merely in the acoustics of the lab, with no virtual-acoustical feedback. This was evident in the variety of

¹⁷⁶ Tom Beghin, "A Composer, His Dedicatee, Her Instrument, Their Room," *The Virtual Haydn Complete Works for Solo Keyboard*, liner notes, 35

¹⁷⁷ Harpsichord by Johann Leydecker (1755), Clavichord in Saxon Style (c. 1760), Harpsichord in French Style (c. 1770), Tafelklavier Ignaz Kober (1788), Fortepiano Anton Walter (1782), and Piano Longman, Clementi & Co (1798)

¹⁷⁸ Woszczyk et al. "Recording Multichannel Sound Within Virtual Acoustics," 6

note lengths, my rhetorical approach to rests or silences, the shaping of certain articulations, such as sigh-figures or longer slurred groups of notes. The examples are endless.¹⁷⁹

The influence of acoustics on classical music performance and composition is well documented. As evidenced in Beghin's reflections, the ability to hear a variety of acoustic spaces and historical keyboards can provide insight into one's own performance style and idiosyncrasies. Following Taruskin's critique, however, speculation about the intentions of the composer or accurately reconstructing historical sounds remains as such.

What is striking about the documentary video and extensive liner notes accompanying *The Virtual Haydn* is the construction of a "thick" historical narrative, especially after such discourses have been so thoroughly critiqued in the musicological literature in recent years. The accompanying literature does not merely document the different acoustic environments, but weaves a detailed story around each room that aims to situate the listener in a particular historical context.¹⁸⁰ Each "program" (i.e., virtual room) suggests a dramatic scene or narrative. For example, Program One is titled "Courting Nobility," and the description is as follows: "We remove the lid of our Viennese harpsichord, and, like the young Mozart, try to impress the noble patrons informally gathered around us as they listen and enjoy their tea."¹⁸¹ Program Eight is titled "Musical Letters to a Princess," and the following description is given: "We eavesdrop on a Princess, who, in her dazzling apartment, is seated at a gorgeously decorated square piano. Appreciative of Haydn's special gift, she reads and learns from the *Kapellmeister's* sonatas."¹⁸² Beghin provides extensive historical information on the

¹⁷⁹ Ibid , 7

¹⁸⁰ There is a relatively short technical section at the end describing the process of simulating the rooms

¹⁸¹ *The Virtual Haydn Complete Works for Solo Keyboard*, liner notes, 53

¹⁸² Ibid , 55

particularities surrounding the composition of certain pieces, including the dedicatee, the venue, the social context, and the keyboard for which it was written. He weaves these historical vignettes together with his own experience of learning and playing the music on historical keyboards and in simulated rooms. Although there are very specific descriptions of the location in which the listener might be hearing each performance, the ostensible access to the variety of contexts, both public and private, suggest an omnipotent and ethereal listener capable of eavesdropping on any situation at any historical moment. Perhaps the most extreme perspective is Program Four, “Haydn’s Workshop,” where the listener is invited to enter the mind of the composer: “We focus on Haydn’s portrait, entering the mind of the master at work: performer and listener are one. We sit at the clavichord and “fantasize.”¹⁸³ Additionally, the interactive program on disc four allows the listener to hear certain pieces in various rooms. Ultimately, the capability of “listening in”—perhaps of surveillance—is afforded to the listener through sound recording technology. In a certain sense, perhaps this fascination is something akin to that associated with a variety of current “reality” television programs wherein viewers are brought into the intimacy of private homes and relationships.

The enclosed documentary video chronicles the researchers visiting the historical sites, choosing the rooms, digitally sampling the acoustics, and returning to McGill to recreate the rooms and record the music. The video frequently presents the researchers as “following in the footsteps” of Haydn. Beghin deliberately takes the ferry from France to England (Haydn made this trip in 1791), and reports, “like Haydn, for most of the one-and-a-half hour journey, I too stayed on deck.”¹⁸⁴ Of their trip to England, Beghin

¹⁸³Ibid., 54.

¹⁸⁴Ibid, 25.

reflects, “I haven't really visited England all that many times, and doing so in the context of this project really brought me in touch with the kinds of emotions or impressions that Haydn would have had as a Viennese coming not just to London, but also enjoying the English countryside [...] This may sound nostalgic [...] sentimental, but I really felt a connection with Haydn.”¹⁸⁵ Beghin obviously has an emotional response to being in the very physical spaces where Haydn worked and traveled. For him, the virtual representations are also capable of eliciting a similar response: “What you take away in the virtual rendition of the room is really the sheer excitement of being there. This is it, this is where Haydn would have been, where the prince would have been.”¹⁸⁶ The researchers are often filmed speaking candidly about various aspects of the project, but at no time are they asked formal questions, and nowhere is it clear to whom they are speaking other than the camera. Furthermore, they are rarely filmed speaking directly to the camera. There is no stated “author” of this documentary, which reinforces the idea that the viewer is merely “eavesdropping” on the production process, and on the candid musings of the people involved. It could be argued that this style of filming draws attention away from the technology mediating the communication, thereby suggesting that it is somehow neutral or impartial.

The researchers acknowledge the limitations of their approach and indicate an awareness of recent critiques of the historically informed performance movement. There is nonetheless an almost willing dismissal of these issues in favor of constructing a historical narrative or fantasy—one that is now centered on performing in historically authentic spaces. They are upfront about their artistic license in selecting the rooms to

¹⁸⁵ *The Virtual Haydn: Complete Works for Solo Keyboard*, documentary video, 1:36:56.

¹⁸⁶ *Ibid.*, 54:40.

simulate, some of which were in fact not venues where Haydn worked. For example, the Hanover Square Rooms in London with which Haydn was familiar no longer exist, causing the researchers to choose the Holywell Music Room in Oxford to represent Haydn's time in England. "We use the room as an English concert hall with an impressive history," they explain, noting that Haydn did visit Oxford.¹⁸⁷ De Francisco also explains that the aural characteristics of the rooms were exaggerated to make the distinctions more audible to the listener.¹⁸⁸

On one hand, there can be no confusion concerning whether or not this project is offering a historical reconstruction. Beghin describes his initial reaction to the project as follows:

When Wieslaw Wosczyk approached me with the idea of "virtual acoustics," I was initially hesitant. My focus had been on Haydn, his dedicatees, and their instruments. Now also their rooms? What about their clothes, also relevant for a specific composure at the keyboard? Candles? (For reading a score.) Humidity? (For tuning.) Suddenly, all the many traps of historical reconstruction felt wide open. We want to breathe life into scores, not because we feel a moral obligation to the past, but because we want them to speak to open-minded twenty-first-century audiences, making full use of present-day know-how and technology.¹⁸⁹

On the other hand, there is an overwhelming amount of attention devoted to creating an elaborate historical narrative. Although aware of the trappings of historical reconstruction, Beghin is candid that his approach to historical performance is akin to acting. Ironically, this is also historically informed:

Whenever I learned a new sonata, I found myself trying with ever greater determination to enter Haydn's mind [...] This is exactly what eighteenth-century sources tell me to do. The ideal of composer and performer as one persona is strongly present in most treatises on performance, and especially in those on

¹⁸⁷ *The Virtual Haydn: Complete Works for Solo Keyboard*, liner notes, 48.

¹⁸⁸ De Francisco, "Recording the Virtual Haydn," 61.

¹⁸⁹ Beghin, "A Composer, His Dedicatee, Her Instrument, Their Room," 44.

playing the keyboard, where it is readily assumed by the listener that the player is also the composer.¹⁹⁰

Taruskin contends that while historically informed performance fails to deliver an accurate historical reconstruction, it does reflect contemporary values:

[On] closer inspection, it becomes ever more apparent that “historical” performers who aim “to get to ‘the truth’” [...] by using period instruments and reviving lost playing techniques actually pick and choose from history’s wares. And they do so in a manner that says more about the values of the late twentieth century than about those of any earlier era.¹⁹¹

The Virtual Haydn takes artistic liberties with the most important feature. The rooms they chose to simulate were not necessarily the actual rooms in which Haydn worked or where his music would have been performed. As a classical music recording, *The Virtual Haydn* is an anomaly because despite the elaborate historical narrative it offers, the technology is its ultimate *raison d’être*, and it is at the forefront in this project, which clearly reflects a contemporary value and obsession with technology. While the researchers do not make audacious claims about accurately re-creating the historical sound, the project’s intensely technical focus and elevation of historical narrative seem to legitimize each other. On one hand, the fact that the project is highly technical seems to justify the accompanying narrative—new technology promises to reveal new insights into the meaning of the music and into Haydn’s compositional process. On the other hand, appealing to historical authenticity seems to justify extreme technical intervention and an approach to recording classical music that is highly unconventional. *The Virtual Haydn* does seem targeted towards the sensibilities and preoccupations of a twenty-first century Western audience (as Beghin hopes) because, while it offers a novel and fascinating presentation of Haydn’s music, it is also a “performance” and veneration of technology.

¹⁹⁰ Ibid., 31.

¹⁹¹ Taruskin, *Text and Act*, 164.

New technologies promise access to previously inaccessible knowledge and experience, as well as an escape from reality into a historically-informed fantasy. The Western faith in science and technology as a means of both understanding and escaping reality is clearly reflected back to us in this project.

Chapter Six: Conclusions

The notion of fidelity in sound recording is complex and is compounded in relation to classical music due to other sites of authenticity to which a recording might attempt to be faithful. The quest for fidelity has been closely tied to recording classical music because translating the sound of live performance to the recorded medium has been a primary objective in this genre. Although measurable progress has been made in technical fidelity (the physical reproduction of sound sources and environments), sound recordings can only create the illusion of three-dimensional sound objects and spaces; therefore representations of original events will necessarily be compromised. Improvements in technical fidelity can be measured somewhat objectively, however it is difficult to define and quantify improvements in the degree of “realism” in sound recording because defining the “reality” to which a recording should be faithful is subjective and changes over time. Sound engineers and producers must choose a perspective from which to represent the musical event, and make subjective decisions throughout the recording process that shape the aesthetic of the final product. For this reason, neither the technology nor the recording process can be impartial or neutral.

While considerable discourse on classical music recording suggests that the technology should ideally be a “transparent” mediator of live sounds, as we have seen, there are aspects of live performance that are generally considered undesirable such as incorrect notes, extraneous noises, and the balance of direct to reverberant sound. Furthermore, when given the choice between a more “accurate” or “realistic”

representation of an original event, listeners do not necessarily prefer the sound of the concert hall (or any other industry standard reference condition). This affirms Sterne's assertion that the goal of reproducing live events is not "reproducing reality, but producing a particular kind of listening experience."¹⁹² While so-called re-creative recordings are modeled on live events, the enhancements sound engineers make are informed by idealized notions of how the music should sound. Although there is some artistic leeway in representing classical music, there are relatively narrow aesthetic parameters within which classical engineers and producers operate compared to the artistic leeway of technical personnel in popular music genres. It is difficult to know what these parameters are, and what is informing the aesthetic decisions of classical engineers and producers. This is a potential area for future research.

While it has been outside the scope of this study, another important aspect to consider is the cultural change in listening and listening conditions over time. Although listeners may not consistently prefer the sound of so-called reference conditions, my research suggests that the ideal aesthetic of classical music recordings has changed over time for technical and cultural reasons. While concert hall realism may have been ideal in the 1950s, its relevance today is debatable and called into question by projects like the *Virtual Haydn* where matching a musical performance with the acoustics of the original (or intended) performance space is proposed as a new site of authenticity in sound recording. Among other factors, changes in the way people consume music and recording technology change the ways people listen and experience music.

Although "transparent" mediation is not possible, there is a prevalent notion that *less* technical intervention and manipulation equals more authentic and honest

¹⁹² Sterne, *The Audible Past*, 246.

communication. While classical music sound engineers report using a variety of techniques to achieve the desired result, many of them still claim to prefer minimal microphone and processing if possible. However, it becomes apparent that “transparent” mediation is not a function of more or less technical intervention, but of how readily the technology disappears into the background. Cases where the technical intervention may be foreground or questionable (such as the *Virtual Haydn* project or other heavily edited period performances) can usually be justified by fidelity to another legitimate site of authenticity in the classical tradition. It is acceptable for the technology to be forefront in the *Virtual Haydn* project because the technology is ostensibly enabling a new level of authenticity by attempting to recreate the acoustics of historically relevant spaces.

A recurring theme related to the desire for objective, impartial, or “transparent” sound reproduction is the question of authorship. By understanding their roles as facilitating a performance, it can be argued that classical music sound engineers and producers deny authorship of their work by downplaying their artistic contributions to the sound quality, the aesthetic, and the perspective of a recording. When subjective and aesthetic decisions are downplayed, sound recording is cast as a more scientific process than an artistic one. Again, this might be seen as a reflection of the relative valuation of science and technology over artistic pursuits in contemporary Western societies. The role of the performer in the classical music tradition is also in some ways a question of authorship. Should performers be “impartial arbiters” and “curators” of the classical cannon, or offer their personal (perhaps unorthodox) interpretation of these works?

The overarching issue is about mediation, and there are several layers of mediation in classical music recordings. There is the mediation of the score (and other

information about the music) by the performer, mediation of the performance through sound recording technology, and mediation of the recording by listeners who, to some extent, choose how and where they listen. Authenticity in classical music performance and recording seems closely tied to the idea of “transparent” or objective communication at each step—at least, this idea is prevalent in these discourses.

This study has primarily looked at North American literature on sound recording, and there is some confusion in the discourse about whether making so-called fidelity recordings, is a scientific endeavor (the pursuit of technical fidelity and making accurate reproduction) or an artistic one. Discourse on the role of the classical music engineer may be less confused in European literature where the *tonmeister* tradition is more prominent because a *tonmeister* is recognized as both an artist and technician. A study that compares North American and European literature on sound engineering might be fruitful for understanding the unique role of the classical sound engineer—a role that straddles art and science.

The notion of accurate reproduction (of technical fidelity) is arguably a more scientific than artistic objective, which may be why there is confusion when applying this concept to recording music, where the foremost goal is ostensibly to communicate musical ideas and expression to the listener. The literature reviewed in this study indicates that even when the aim is to make realistic-sounding recordings—which, as we have seen, is predominantly the case for classical music—the ultimate goal is the creation of immersive and engaging listening experiences which may or may not be faithful to the live performance.

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