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The Incorporated Hornist: Instruments, Embodiment, and the Performance of Music

M. Elizabeth Fleming
The Graduate Center, City University of New York

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THE INCORPORATED HORNIST:
INSTRUMENTS, EMBODIMENT, AND THE PERFORMANCE OF MUSIC

by

M. ELIZABETH FLEMING

A dissertation submitted to the Graduate Faculty in Music in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

2019
The Incorporated Hornist: Instruments, Embodiment, and the Performance of Music

by

M. Elizabeth Fleming

This manuscript has been read and accepted for the Graduate Faculty in Music in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

________________________________________________
Date
Joseph N. Straus
Chair of Examining Committee

________________________________________________
Date
Norman Carey
Executive Officer

Supervisory Committee:

Emily Wilbourne
Scott Burnham
Joseph N. Straus
Emily I. Dolan

THE CITY UNIVERSITY OF NEW YORK
ABSTRACT

The Incorporated Hornist: Instruments, Embodiment, and the Performance of Music

by

M. Elizabeth Fleming

Advisor: Emily Wilbourne

Roland Barthes famously described the “grain” as “the body in the voice as it sings, the hand as it writes, the limb as it performs.”¹ Stated simply, this project asks What is the body in the horn as it sounds? Instrumentality is typically understood as extension and expression beyond the boundaries of the body; brass instrument musicking, however, begins not where the sound emerges from the bell, but at the very least at the meeting point of the player’s breath, the surfaces of the body, and the tube of the instrument. This project of instrumental incorporation understands music as a place where bodies technological and corporeal, real and conjectural meet. Using perspectives from critical organology, embodiment, disability studies, voice studies, and performance-based approaches, I examine the technologies and techniques of bodies and instruments in four case studies in the hornist’s repertoire: Beethoven’s Eroica Symphony; Brahms’s Trio for Piano, Violin, and Waldhorn; Messiaen’s “Appel interstellaire”; and Ligeti’s Trio. I propose that the sounding of this repertoire be understood as composing and re-composing intercorporeal encounters and articulations, weaving polyphonic connections between

instrumental and bodily techniques and technologies, and revealing multiple and contingent voices at work when we make music.
ACKNOWLEDGEMENTS

A dissertation is always a capstone; my journey toward this reconciliation of performing and philosophical selves—both always musical and mindful—has been, perhaps, even longer than most. To begin with the end: Since our independent study three years ago where I first began to sketch out these ideas, Emily Wilbourne’s pragmatic direction and absolute encouragement has never faltered, and this dissertation would have never seen the light of day without her. Scott Burnham has shared his keen mind and generous spirit consistently throughout the writing of this project. I extend grateful thanks to Joseph Straus and Emily I. Dolan for serving on my dissertation committee, for their time discussing portions of this project from very early stages, and for taking interest in my professional development. Of course, none of this would have possible without financial and academic support from The Graduate Center, CUNY, and from the Music Department specifically; here I extend particular thanks to Norman Carey for his support to begin my journey at the Graduate Center, to Anne Stone for her encouragement to take it in new directions and the professional support to see it through, and to Tonisha Alexander and Jacquelyn Martelle for their invaluable logistical assistance.

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INTRODUCTION

HORNS, BODIES, VOICES, and MUSIC

Objects of Inquiry

The objects to be classified are alive and dynamic, indifferent to sharp demarcation and set form, while systems are static and depend upon sharply-drawn demarcations and categories. These considerations bring special difficulties to the classifier, though also an attractive challenge: his aim must be to develop and refine his concepts so that they better and better fit the reality of his material, sharpen his perception, and enable him to place a specific case in the scheme quickly and securely.

In general we have tried to base our subdivisions only on those features which can be identified from the visible form of the instrument, avoiding subjective preferences and leaving the instrument itself unmeddled with.


In pursuit of a scientifically informed system to classify the musical instruments of the world, Erich Moritz von Hornbostel and Curt Sachs developed a taxonomical approach that grouped the objects according to their physical mode of sound production. The study of musical instruments had been proposed as a crucial element in Guido Adler’s 1885 proposal of

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3 Ibid. Note that early catalogues of musical instruments, such as those of Mersenne, Praetorius, and Virdung in the fifteenth and sixteenth centuries, were focused on European instruments only; Victor-Charles Mahillon inaugurated modern instrumental taxonomy with the pragmatic project cataloging the more globally-expansive collection at the Brussels Conservatory Instrument Museum in 1880. Developing his model, Hornbostel and Sachs sought a larger area of capture for all the instruments of the world, those which exist and all those which could be imagined, for both scholarly and museological use. See Margaret Kartomi, “The Classification of Musical Instruments: Changing Trends in Research from the Late Nineteenth Century, with Special Reference to the 1990s,” Ethnomusicology 45, no. 2 (Spring 2001): 284.
Musikwissenschaft—the scientific study of the musical art, what would become musicology. Hornbostel and Sachs’s system for the systematic capture of musical instruments proved foundational to the development of that subdiscipline of musicology, and to organization and display of these cultural objects museums, which had begun in earnest in the eighteenth century. Through the comparison and classification of instruments, systematic musicologists working on instruments sought to reveal the “universal laws” of music.

To this end, seeking to avoid culturally-specific lexical labels, Hornbostel and Sachs’s taxonomy identified and classified instruments by means of a Dewey-decimal inspired numeral system. In addition, they proposed acoustically descriptive, Greek-derived terms such as membranophone and idiophone that, since the H-S system’s first publication in the Zeitschrift fur Ethnologie in 1914, have become common in academic musical discourse. By mid-century, the study of musical instruments had flourished into a new subdiscipline with a name of its own: organology. The term was first coined by Nicholas Bessaraboff to distinguish it from its parent discipline: “The creative, artistic, and scientific aspect of music might be entitled musicology. The scientific and engineering aspect of musical instruments might be entitled organology.”

Hornbostel and Sachs seem to have come up short, however, in a new “culture-free” term for the taxon that would contain such diverse instruments as Western orchestral “brasswind”

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7 For a reduced schematic of the Hornbostel-Sachs system, focused upon the horn and its relations, see Appendix A.

(including trumpets, horns, trombones, and tubas; instruments that, in their modern instantiation, are all typically made of brass), alphorns and vuvuzelas, cornettos and sackbuts, superbones and shofars, the Tibetan dungchen and the Aboriginal digeridoo. Gathered under the numeric sign 423, these are all instruments that sound principally when the (4) aerophone’s (2) standing column of air (3) is set into motion by the player’s lips. This diverse array was grouped under the Eurocentric label *trumpet*, which is an instrument associated with a mode of sound production rather than describing the *source* of sound production, here the vibrating lips of the player. (The label reflects, perhaps, the organologists’ attempt to “base our subdivisions only on those features which can be identified from the visible form of the instrument, avoiding subjective preferences and leaving the instrument itself unmeddled with.” While the sound of the piano is produced inside the body of the instrument, with hammers striking strings, the sound of 423 instruments is produced at the surface of the player’s body—the lips are, in Sachs’s later writing, “the essential acoustical factor.” So Hornbostel and Sachs’s label refers to instruments that demand in a particular way the intervention of a human body to make sound; however, organology has not, historically, managed to locate this component under its purview.

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9 The term “brasswind” is common in orchestral circles to describe wind instruments (aerophones) that are either (a) typically (though not exclusively) made of metal, or, (b) closer to H-S logic, sounded in the manner of all these exemplars, that is, with the vibration of the player’s lips. Similarly, “winds” is typically used in a restricted sense mean the orchestral section including flute and reed-type aerophones, also called “woodwinds,” which can be made of wood, metal, or many other materials. The grouping of “woodwinds” can occasionally can include the horn depending on its use within the orchestral palette (hence why the instrument is included woodwind quintets and *harmonie* ensembles).


The larger academic discipline that developed from Adler’s model, musicology, was dedicated to the “scientific examination” of the products of the tonal arts—epitomized by the European musical work, embodied in the music notation of the score, and, to a lesser extent, the composers that made them.13 His concept of music as “works” to be studied—a fixed object or product of tonal art—was not, however, based upon a “universal” concept of music, excised of time and place. Rather, as Lydia Goehr has demonstrated, the concept of the “musical work” had only coalesced in the early nineteenth century.14 The result was the transmogrification of music into a lasting artifact; already complete in-and-of-itself, transcendent, untouchable, separated from the realm of the mundane; a sonic object meant for detached, formalist contemplation as one might observe a plastic art object. These ideas were institutionalized in the modern concert hall, a performance space set apart from everyday life, dedicated to the rituals of musical performance, where learned audiences, hidden under cover of darkness, gather in rapt and silent attention to the works manifest before their aural gaze.15 With the increasing distinction between the roles of composer, performer, audience, and analyst and the ossification of the musical canon, performance came to mean the faithful recreation of the Work—\textit{Werktreue}—but was ultimately subordinate in value to it because the performance would always be derivative of it, or else because, while the performance fades, the work remains.16 Under such conditions,

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13 Adler, “Method, Scope, and Aims,” 6. Note that Adler is critical of placing too much weight on composer biography as musicology, but rather an important “ancillary” field (Ibid, 10), for “one must always, above all, retain the works of art themselves at the centre of investigation” (Ibid, 9).


15 Indeed, at the Beyreuth \textit{Festspielhaus}, Wagner’s self-designed shrine to \textit{Gesamtkunstwerk}, the opera orchestra was also submerged into the orchestra pit, hidden from view, so that the music could appear to have no sounding source.

16 Ibid., “The Perfect Performance of Music and the Perfect Musical Performance,” \textit{New Formations} 27, “Performance Matters” (1995): 1–22. Goehr relates \textit{Werktreue} to Walter Wiora’s concept of \textit{Aufführungspraxis}, which held that the work was fully composed prior to performance, in contradistinction to earlier \textit{Ausführungspraxis}, which held that the work was only complete once it was given shape in performance, for example, through the realization of basso continuo lines or ornamentation (Ibid., 5).
performers became subject to a moral responsibility of self-effacement to become a medium for “the composer’s voice,” for the best performances were transparent, their performers even invisible or inaudible, since “what is actually heard in the concrete soundings out of the work is much less valuable than the transcendent meaning of the works they are supposed to convey.”

“Music was born free; and to win freedom is its destiny,” Ferruccio Busoni wrote in his Sketch for a New Aesthetics of Music. “It will become the most complete of all reflexes of Nature by reason of its untrammeled immateriality. Even the poetic word ranks lower in point of incorporeality.”

In a now classic essay, Carolyn Abbate calls for a turn from musicology’s gnostic attitude, the detached contemplation of the musical work, toward the drastic, the live music performance event. In part, the turn invites in the musical performer as both object and agent. Participants in musical performance are, as Abbate describes, confronted with “uncanniness”—which we might understand as the gap between present concrete sound and the transcendence it seems to offer—as well as the “superhuman” quality of virtuosity, the performer-focused mode of musical performance that (under Werktreue) trucks perversely with the diabolical, or simply merely human, sources of musical sound. Virtuosity here can be understood as an exceptional

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17 Ibid., 7. Stravinsky once wrote: “The secret of perfection lies all in [the performer's] consciousness of the law imposed upon him by what he is performing” (cited in Goehr, “Perfect Performance of Music,” 7). The concept of “the composer’s voice” is explored by Edward T. Cone, The Composer's Voice (Berkeley: University of California Press, 1974), and will be taken up in detail in the ensuing chapters.


20 Ibid., and Goehr, “The Perfect Performance of Music.”
fluency of the performer’s body, and at its most valuable and visible, is prized for an almost enfreaked loquaciousness—how did she do that?—performing aural feats with visually appropriate yet minimal signs of the body’s work (the sweat on the brow, a slight reddening of the tenor’s face as he sustains the high C) but ultimately without risk. By contrast with these most theatrical cases (what Goehr refers to as “the perfect musical performance”), the “perfect performance of music” transcends awareness of the body; appropriate fluency of the performer yields transparency of the apparatus that is sounding, even when it is before our very eyes. That is, the performer’s body as medium disappears in the aural event and spaces where the sound of the imagination of the composer meets the ear of the listener. Idealized musical contemplation in the Western art music tradition (or the gnostic), Abbate tells us, “implies not just knowledge per se but making the opaque transparent.” In short, the performing body may cease to be sensually recognized at all.

As opposed to the gnostic, “the drastic connotes physicality, but also desperation and peril, involving a category of knowledge that flows from drastic actions or experiences and not from verbally-mediated reasoning.” To illustrate the peril of the drastic, Abbate recounts a performance in which Ben Heppner’s voice, his performing apparatus, fails him (in her words) “spectacularly,” a pitiful irony as he must nonetheless continue to sing strophe after strophe of the Meistersinger’s Prize Song. The cracking in the voice, an aural trace of the bodily instrument’s impairment, breaks the spell of performance: the singing man onstage is no longer Walther of Nuremburg, singing a self-composed work to win the hand of his beloved, but rather an all-too-present Heldentenor struggling to perform Wagner’s lines according to ideals that

21 Ibid.
22 Abbate, “Drastic or Gnostic?” 510.
23 Ibid.
24 Ibid., 535.
demand his unceasing fluency. In identifying this moment where the singer again “became a unique human being in a singular place in time,” Abbate tacitly points back to the invisibility of the body—indeed, of the humanity that is always at risk of exposure—in idealized performance. She elsewhere describes such moments of spectacular failure of the performing body as an emergence of the “presence of the performer,” but which can cause “painful junctures” in gnostic listening experience.

Horn players miss notes—a lot. The resulting clams, cracks, splits, cacks, breaks, and flubs are familiar to hornists and their listeners alike, sullying both musical enjoyment and the otherwise mellifluous instrument’s reputation. It is not a function of training—even the best players miss notes at times—nor a question of focus and concentration. It is because, for all its transcendence on the ideational place, music is a practice that uses bodies as material, as labor, as the energy and the necessary friction that makes aural sound even possible. Music uses them up, creating slightly different conditions today than yesterday—a stiffness in the fingers, a swollen lip, a thinned reed, a less sensitive ear drum—and the work of such unruly bodies can never be entirely complete.

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25 “The disrupted voice conveys meaning even before it conveys language; in Western cultures, we hear disruption as pathology, in both the current and obsolete meanings of the word: it is indicative of passions, suffering, disease, malfunction, abnormality. We hear it, too, as the result of labor—the physical trace of an agent working on the body.” Laurie Stras, “The Organ of the Soul: Voice, Damage, and Affect,” in Sounding Off: Theorizing Disability in Music, ed. Neil Lerner and Joseph N. Straus (New York: Routledge, 2006), 173.

Bodies Return to Musicology: The Performative Turn

This breaking of the body—the sonification of coming up short in the musical moment—dramatically frames the sudden intrusion of the body upon the awareness of the performer or listener, and is a common trope that begins many of the studies in musicology that came in the wake of the “performative turn” in the humanities more broadly. This postmodern approach, which understands all human behavior as performance, as a theater of the everyday, gained steady traction in musicology through the 1990s and particularly the 2000s as recordings (the sonic archive of a performance), concert events, and bodily gesture and presentation were revealed as new sites, and often new texts, for analysis. In thinking about the “mind-body” problem in music, Cusick describes:

Music, an art which self-evidently does not exist until bodies make it and/or receive it, is thought about as if it were a mind-mind game. Thus, when we think analytically about music, what we ordinarily do is describe practices of the mind (the composer’s choices) for the sake of informing the practices of other minds (who will assign meaning to the resulting sounds)…. We end by ignoring the fact that these practices of the mind are nonpractices.

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Goehr presents a different view on recordings. She gives the example of pianist Glenn Gould, who forsook the public concert stage for the studio, to argue that audio recordings may (under the Werktreue paradigm) present a more perfect embodiment of the transcendent work by removing the visual presentation of the performer entirely: “the ‘ministrations of the radio and phonograph’ are more successful in their mission to convey divine works to contemplating listeners via interpretations that the performers strive”—and in the case of multi-take recording and editing, craft through further technological mediation—“to make as perfect as possible” (“Perfect Performance of Music,” 1).
without the bodily practices they call for—about which it has become unthinkable to think.  

“How would our disciplines and methodologies change,” writes performance studies scholar Diana Taylor, “if we took seriously the idea that bodies (and not only books and documents) produce, store, and transfer knowledge?” Rather than smooth, unidirectional pathways between the mind of the composer and that of the listener—attending only to “the composer’s voice” as a kind of Cartesian meeting of the minds transferred through the document of the score and its transparent Werktreische sonic embodiments—in these readings, attention to performances or the necessary somatic actions therein can reveal sedimented rituals of musical experience, multiple points for the articulation of meaning and, moreover, opportunities for re-composition.

This project assumes Nicholas Cook’s reframing of scores not as objects for detached contemplation, but as scripts for real performance; this approach is amplified in Edward Klorman’s Mozart’s Music of Friends, which decenters the composer’s singular persona for a distribution between multiple agents in musical “conversation” with one another. Moreover, if


31 An archetypical example of the former is Edward T. Cone’s The Composer’s Voice, examined in detail in the first chapter. Challenges include Cusick’s “Gender and the Cultural Work,” where a given vocal interpretation of Schubert can challenge normative gender performativity, Abbate’s “Music—Drastic or Gnostic?,” where vocal failure can bring attention back to the act of performing, or knowledge of later historical appropriation can color reception and meaning, Le Guin’s Boccherini’s Body, where the hand positions of the cellist can become “themes” in their own right,” or, more recently, Edward Klorman, Mozart’s Music of Friends: Social Interplay in the Chamber Works (Cambridge: Cambridge University Press, 2016), where a new approach to musical analysis makes grants “multiple agents” that converse about music in music to give rise to the work.

we move beyond the concept of a script—implying allusion to the *logos* of vocalic utterance—we can also consider scores as *choreographies* for performance, coordinating actual actions that give rise to musical sound. Approaches in music thus framed have included the study of bodily gesture, movement, and technique, where musical action can be understood to organize the bodies of participants—here performers, but also listeners—in specific ways that can speak to both drastic musical experience and gnostic musical meaning located immanently at the level of the body, if we attend to music as more than aural experience. These traces of the body are perhaps most famously formulated by Roland Barthes in his articulation of “the grain of the voice”: the grain is the body working upon language, its material substrate, “the materiality of the body speaking its mother tongue,” “the body in the singing voice, in the writing hand, in the performing limb.”

Foregrounding musical *praxis* (in Barthes’s words, a “musica practica”), some of the most conspicuous of these findings has privileged the externalized, visually demonstrative movements of the fingers, hands, arms, and even facial expressions of the pianist, cellist, and guitarist. For example, Tom Beghin’s readings of Haydn’s piano sonatas posit arm-crossings and facial gestures as crucial rhetorical devices scripted by the composer for delivery by the performer.

In this project, the body at the horn—previously unstudied in this framework—becomes an object of inquiry. The movements and “action-sound coupling” of the hornist, however, are more concealed: sound production takes place at the lips, erupting nonetheless at the surface of

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the body, but their actions are invisible behind the opaque mouthpiece, and the movement of the fingers, only a recent addition to the interface of the instrument, is less obvious than their wide-ranging and tangled movements across the distributed topography of the keyboard.\textsuperscript{36} For all its apparent extroversion, the hornist’s work is closer to that of the singing voice, an “internal corporeal choreography” of the surfaces of the body which finds resonance with Nina Sun Eidsheim’s pedagogy-driven observation that music is action \textit{before} it is sound.\textsuperscript{37} To reflect this orientation of music as action, as activity, I will employ the verb and gerund form of the verb \textit{to music—}musicking—liberally.\textsuperscript{38}

Some of the earliest attention to gesture in music tended to the psychological aspects of listening, built upon a metaphorical relationship to the body’s movement through time and space. Arnie Cox takes these metaphors and locates their referents squarely in the sensorial, embodied experience and mimetic participation with the musical event.\textsuperscript{39} For example, we experience a sense of pitch getting higher, for example, since we use the term “high” to refer to situations of increased quantity or magnitude, to those things that feel as if they are moving beyond reach, and

\textsuperscript{36} De Souza, \textit{Music at Hand}, 31–30, 33–38. Similarly, de Souza’s central chapter on idiomaticity is focused on the harmonica: “The harmonica fits in my palm, but my hands cannot make it sound. The harmonica, after all, is a particular sort of wind instrument, a ‘mouth organ’.” As a free reed aerophone, “the harmonica converts my breath into music” (Ibid., 53).


\textsuperscript{38} The term was popularized in Christopher Small’s \textit{Musicking}. For Small, “To music is to take part, in any capacity, in a musical performance, whether by performing, by listening, by rehearsing or practicing, by providing material for performance (what is called composing), or by dancing” (Ibid., 9). I do not, however, fully accept his suggestion that “performance does not exist in order to present musical works, but rather, musical works exist in order to give performers something to perform” (Ibid., 8). For Western art music practitioners and audiences—those musicking under the regulative work-concept—I would soften the wording: \textit{performances happen whenever musical works are realized in whole or in part, and musical works exist, in part, to be realized in performance.}

singing at increased frequencies requires (in general) greater effort. In short, musical pitch feels “higher” because we know what it feels like to sing pitches with the greater exertion required to produce pitch of greater frequency. As such, music can imply virtual bodies or agents in motion, bring them to our imagination, but also affect our embodied experience as listeners. When the actual sensations and actions of the performing body are given more epistemological significance in our experience of music, they can be read as providing another layer of musicality upon that which is legible in the score: the organization of fingers and breath can be a kind of action-based counterpoint against the sonic results of those movements, or a hand position, “merely as a position”—and not necessarily its sonic results—“could be said to constitute a theme.”

Introverted, phenomenological readings of performance provide attention to haptic sensation and affect, to tactile, sensuous, and personal experiences of music. For some of these analysts, these bodily actions can take the form of a private, bodily message from the performing-composer to the subject-performer—inaudible to the gnostic listener. Others work

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40 Cox, Music and Embodied Cognition: Listening, Moving, Feeling, and Thinking (Bloomington: Indiana University Press, 2016). Cox examines the experiential conflation of higher and greater in his chapter on pitch height, in Ibid., 85–108. “For example, the 440 in A-440 is not literally higher than the 415 in A-415 but is instead greater [in terms of frequency],” Ibid., 93.

41 Fischer and Lochhead, “Analysing from the Body”; Le Guin, Boccherini’s Body. See also Cox, “Motive, Gesture and the Analysis of Performance,” in New Perspectives on Music and Gesture, ed. John Rink, Neta Spiro, and Nicholas Gold (Farnham: Ashgate, 2011), 267–292, which argues not that motives have gestural analogs, but that gestures have motivic function.

Adler seemed to anticipate some of the developments outlined in this introduction, though he would likely have put them under the third division of pedagogy and pragmatics (including the study of composition and pedagogy) as opposed to the historical and systematic divisions: “If the composition is purely instrumental, then the way in which the instrument or instruments are handled, must be gone into. The instrumentation must be examined, that is, the way in which the instrumental sound-groups and -bodies are united and separated, contrasted and blended. Together with this, the realisation [Ausführung]—better still, the pragmatics involved in performance or realisation [Aus- oder Aufführbarkeit]—can be considered; the fingering on the instruments to be used in this instance, the manner of performance, the intensity of volume of sound at different points, the distribution of the [instrumental] voice types, etc.” (“Method, Scope, and Aims,” 6; emphasis added).

42 Cusick, “Feminist Theory, Music Theory”; Le Guin, Boccherini’s Body. Sitting with a Boccherini sonata at the cello, Le Guin writes: “I have become not just his hands, but his binding agent, the continuity, the consciousness…. As this composer’s agent in performance, I do in this wise become him, in much the same manner that I become myself. And my experience of becoming him is grounded in and expressed through the medium of the tactile” (ibid., 24).
more upon personal memory of the *soma*, where a clarinetist might experience a kind of residual
tonality in the hands when working in post-tonal soundscapes, or a pianist can gain new
improvisatory skill through analogy to previously learned skills such as walking or typing.\(^{43}\) On
one hand, we have the sense that the conscious cannot entirely overwrite or supersede the
habituated actions of the body; on the other, the techniques of the body exceed our ability to
capture them in writing, musical or lexical.\(^{44}\) The body comes to write its own phenomenological
themes upon the aural musical experience, and musical practice can act as a crucial epistemology
of the body.

Additionally, scholars have used musical practice to write new histories of the contingent
body, for historical understandings of the body and its uses have changed at least as frequently as
musical style. Le Guin’s “cello and bow” thinking is but the first chapter in a larger examination
of Boccherini’s body, writing a biography of his years in Spain, richly recapturing *sensibilité* and
visuality as crucial aspects of late Enlightenment performance, and examining his “melancholy
anatomy.”\(^ {45}\) James Q. Davies traces the development of anatomical science in the 1820s and
1830s and its relationship to piano and vocal technique, revealing shifting concepts on how it is
that the body becomes musical, and Bonnie Gordon has performed similar work on the castrato’s
instrument.\(^ {46}\) Roger Moseley engages in a wide-ranging study of the cultural and digital
techniques of the keyboard interface—from the piano to video games—in his ludomusicological
study *Keys to Play*.\(^ {47}\)

\(^{43}\) Fischer and Lochhead, “Analysing from the Body”; David Sudnow, *Ways of the Hand: A Rewritten Account*

\(^{44}\) Sudnow, *Ways of the Hand*; Eidsheim, *Sensing Sound*.

\(^{45}\) Le Guin, *Boccherini’s Body*.

\(^{46}\) Davies, *Romantic Anatomies*; Bonnie Gordon, “It’s Not About the Cut: The Castrato’s Instrumentalized Song,”

\(^{47}\) Roger Moseley, *Keys to Play: Music as a Ludic Medium from Apollo to Nintendo* (Berkeley: University of
These studies rely upon both a trained and continuous training of the musicking body. I understand this as the body being instrumentalized in particular ways, by virtue of musical goals, historical and geographical location, and, crucially here, by the particular musicking objects they interact with. The musical instruments become aligned with scientific ones; that is, musical instruments become not only objects of study, but rather instrumental, a means to an end, a pathway to new understandings of the bodies that the performers frame in their gaze. Yet the body is not a stable experience for the subject, either; the phenomenology of the body shifting through and across musical and historical contexts yields, ultimately, different bodies, a dynamism and multiplicity of bodies, which bring their own histories and possibilities for action.

**Instruments Return to Musicology: The Material Turn**

Even if the focus is only upon “the instrument itself,” musical instruments have a long filiation with bodies: they have been made out of bones—previously internal to the body, or protruding from it, in the case of tortoise shell lyres or animal horns—or exoskeletons, such as conch shell trumpets. They have been made with plant bodies—tree branches, reeds, bamboo, bark—and with animal skins, leathers, and guts. They sometimes do not even need a human to sound, such as in the case of wind chimes or the aeolian harp; in general, however, they are constructed for our fingers and breath to touch them in particular ways.

We often anthropomorphize our instruments, granting them personal names, and instruments also have their own distinct anatomies once formed. And like gestures of musical

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48 Adler, “Methods, Aim, and Scope,” 9: “Vocal and instrumental techniques have changed with the progress of art. On occasion the exercise of technique has acted as an influence on the production of art. This is particularly the case with instruments in vogue, which have even occasionally, on the one hand detracted from, or on the other hand extended, creative activity.” See also Szendy, Phantom Limbs.

sound, we have an analogical, even *homological* relationship with musical instruments. We grant their forms similar names to those that we use for our own: resonating bodies, extending necks, shaping throats. I do not take for granted that the overall form of the horn, from mouthpiece to bell tail—even when made out of carefully shaped metal beaten and drawn over anvils and mandrels—is referred to as a *corpus*. These technological bodies are, like the human body, shaped by history, by time and place, endowed by their creators to produce sound in particular ways.

In his work on the piano of the late Enlightenment, Beghin compares performance of musical works upon various types of instruments—some contemporaneous with one another, some in succession—which can yield dramatically different results from the performer’s perspective. For example, he proposes a narrative of a Haydn capriccio that is revealed by performance at the short octave keyboard—an instrument popular in Vienna through the 1780s but virtually unknown today—and, in another essay, he compares performance of a Mozart sonata upon earlier and later instruments to reveal the sensibility of analytically-assigned meaning.\(^50\) Similarly, John Irving describes how certain readings of musical works are only available to the ear from certain instruments; that is, the meaning of a work can actually change depending on which instrument is used, even from within the same organological taxa.\(^51\)

Beghin’s and Irving’s work as performer-scholars is grounded in the historical performance movement, which for the second half of the twentieth century sought to revive a

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positivistic approach for the performance of “early works.”52 Those allied with the “performance practice” movement intensely study not only original editions of works—their texts—but also performance treatises to enlighten their realization in performance, for the music under consideration existed before the ossification of the regulative work concept, and these “works” could only be completed in performance through the realization of bass lines and ornamentation.

Of course, fidelity in performance of the older repertoire required appropriate instruments upon which to realize this burgeoning canon; this supply was sourced in collections of historical instruments whose accumulation had begun in earnest in the eighteenth and nineteenth centuries, and also by the twentieth century science dedicated to their examination and preservation: organology.

Yet by the end of the twentieth century, organology had become far more than scientistic instrument measurement and design. At its broadest, as organologist Renato Meucci described in 1999, “the term [organology] denotes the discipline which studies musical instruments (or, as some prefer, ‘sounding object’), whatever the perspective of means of approach to them,” rejecting previous restrictive definitions such as Bessaraboff’s.53 Organologists have written not only systematic descriptions of instruments, but also histories of the contexts and practices in which they were used, of their iconography, instrument making, of collecting, and of the museum. Acousticians study instruments’ sounding principles and chart distinctions between them, further refining our knowledge of the science of our musical sounds. Work from musicologists and performers—such as Beghin’s work on historical keyboard instruments and Moseley’s on the keyboard interface—can be easily understood as part of a broadened, “new”


organology, which places the instrument in active sounding dialogue with repertoire and practice.

While there have been refinements in its construction, the standard orchestral horn remains, more or less, the same as developed by Edward Kruspe in the last decade of the nineteenth century, called the “double” horn. Yet this horn is, in many ways, a far cry from the horns which first sounded Beethoven’s *Eroica* symphony, and even the horns which first sounded Brahms’s symphonies—enough that Beethoven’s horn and the horn for which Schumann, Wagner and later composers wrote are separated from one another at the next level of bifurcation of Hornbostel and Sachs’s taxonomy.

The industrialization of music in the nineteenth century was realized in developments upon the instruments of the orchestra—“improvements” upon their earlier iterations—as well as the creation of new instruments that could be added to the ensemble, such as the saxophone and the tuba, and their mass manufacture. Existing instruments were also added as supernumeraries to the orchestral forces, such as the piano and organ (which had served as continuo instruments through the early Enlightenment, but disappeared from the symphonic ensemble before the end of the eighteenth century), the harp, the glockenspiel, the cymbal, and the gong. Interest in ethnology, fueled by social Darwinistic and comparative perspectives, also increased the capture of the instruments of the world into collections and, through nationalist and orientalist drives in Euro-American composition, these instruments found their way into Western art music as novelties—consider the castanet, the conga drum, or, in past few decades, the Indian sitar or

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54 This instrument will be examined in brief in the third chapter; see also Appendix B for its compass.
55 See Appendix A.
Chinese pipa as a concertante instrument against the Western orchestra—or as more permanent members, including the xylophone and the marimba.

New percussion instruments expanded wildly in the late nineteenth century, as composers leaned into the programmatic representation of the natural world—for example, a wind machine and thunder sheet added as auxiliary percussion for Strauss’s *Eine Alpensinfonie*—or with the urban environment, such as the use of car horns in Gershwin’s *An American in Paris*. In the twentieth century, the development of instruments such as the Theremin, the ondes Martenot, and the synthesizer would force the creation of a new taxa for Hornbostel-Sachs: electric instruments. More experimental strains of composition in the twentieth century would expand the instrumentarium by aestheticizing the sounds of everyday objects: famous examples include the *bouteilophone* constructed from tuned wine bottles (Erik Satie’s *Parade*), the brake drum (John Cage’s *First Construction in Metal*), wireless radios (John Cage’s *Landscapes No. 4*), the common metronome (Gyorgy Ligeti’s *Poème symphonique*), or even hand clapping (Steve Reich’s *Clapping Music*). Composers began pushing the boundary of “music” away from an art of tones to an art of *sounds*, and eventually into *sound art*; in the process, composers began creating installation pieces which aestheticized not only sound but the very spaces it inhabited. A prime example is Alvin Lucier’s *I am sitting in a room*, in which the room becomes the instrument that shapes the speaker’s voice and in the process, strips it of lexical meaning.56

As these works challenged what “counts” as music and what “counts” as an instrument, we see the concept of music moving from a stable, formalist object to processes of working on

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56 For more on the room as instrument, see Daniel Fox, “Does It Matter Which Room Alvin Lucier Sits In?,” *American Musicological Society/Society for Music Theory* Annual Meeting (San Antonio, TX: 2018).

In his recording project *The Virtual Haydn*, Beghin considers that to fully appreciate Haydn’s English sonatas, we must not only hear them on the original instruments, but in the original *rooms* in which they might have been experienced; that is, he conceptually expands the designation of instrument to include the material aspects of the spaces in which musical sounds occur, and, by digitally recreating these spaces, uses them to further shape the sounds once they leave the instrument proper.
and with sound as material.\textsuperscript{57} This is echoed in the twenty-first century by the adoption of a new strain of musicology informed by the material turn and media theory in the twenty-first century, one which counterpoises music’s Romantic transcendent idealism with its immanence, its relationality, and its always-already mediation.\textsuperscript{58} Music is, for these writers, before anything else material, and its objects—whether they directly make sound or not, even the question of sound itself—become crucial epistemological objects for how we understand music (and musicology) as both a product and as a practice, historically and systematically.

New and critical approaches in and to organology have expanded the historically positivistic inquiry surrounding musical objects into a consolidated field of techné—technological knowledges, and the shared root of technology and techniques. Informed, for example, by science and technology studies (including diverse approaches to culture and society’s relationships with technology) musical instruments become more than passive objects to catalogue, measure, and display; “alive and dynamic”—to extend Hornbostel and Sachs’s original rationale—instruments and other sound objects are the material substrate of transcendent music, become social objects, even agentic in their ability to shape the sensibilities of their audiences and to interpellate communities.\textsuperscript{59}

\textsuperscript{57} Goehr argues that avant-garde strains such as Cage’s aleatory might shed Romantic aesthetics, but nonetheless operate under the reified work concept, since we attend to it in the same manner (\textit{Imaginary Museum}, 260–70).
One might think here of the titular non-human protagonist of François Girard’s 1998 film *The Red Violin*; indeed, Eliot Bates uses this example in a larger article about the “social life of instruments,” where musical instruments play active roles as mediating—in their sound, in their manufacture, in their pedagogy—various kinds of relationships within and across the boundaries of the human and non-human.60 These agencies operate not only in fantastical literatures or far-flung musicking rituals: Emily I. Dolan’s work on orchestration in practice, in treatises, and embodied in mechanical automatons of the nineteenth century reveals various technologies of *timbre* that significantly changed our posture of attention to music by the mid-Romantic; work by Jonathan Sterne, Thomas Patteson, and Brian Kane shares similar concerns with how our listening and aesthetics has been profoundly shaped by and for musical media and sonic technologies.61 These “instruments” can even extend to those of science, of theater, and to other aspects of sensorial experience: Deirdre Loughridge and Gundela Kreuzer, for example, examine the role of the audiovisual culture in the proto- and high Romantic, using examples such as the telescope, the magic lantern, and the shadow play in the late eighteenth and early nineteenth century and the stagecraft of *Curtain, Gong, Steam* in Wagner’s operas.62

With this expanded instrumentarium of sounding objects—a wider capture of what might count as a “musical object”—we can also then include Abbate’s recent work on the early

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microphone, Jonathan Sterne’s explorations of digital music formats, Davies’s work on printed music collections as social objects, and even the understandings of the human ear, as explored by Alexandra Hui—into a new organology. We can include Alvin Lucier’s rooms and, as Beghin implicitly does, Haydn’s rooms, too. We can also then include the sounding, singing body into an expanded vision of a discipline that had previously denied them.

Davies’s *Romantic Anatomies* traces the shifts in the singer’s instrument in a two-decade span of the nineteenth century; similarly, Bonnie Gordon dives into the gulf between the castrato’s vocal techniques, based on early anatomical texts, and that of the modern coloratura soprano, noting that “it’s not about the cut,” but rather about the techniques used to train the body into the instrument at all. Nina Sun Eidsheim examines materials and surfaces of the body at work in the modern operatic voice and their choreographies, and the voice moves from metaphor, from disembodied melody, to the “human voice as instrumentalized matter,” and its sonic results as material, “vibrating air.”

Over a century later, Hornbostel and Sachs’s system remains the standard for the comparative classification of musical instruments, though it has been nuanced and revised several times in the last few decades. Though all extant versions still deny the human voice classification, almost all revisions have included a new label for 423: trumpets have become *labrosones* or *labrophones*, *lip-vibrated* or *lip-activated* aerophones, or even *lip-reeds*. The

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64 Davies, *Romantic Anatomies*; Gordon, “It’s Not about the Cut.”
66 For summary of proposed labels and sources, see Appendix A. Several other classification systems have been proposed that take into account an instrument’s material cultural function; however, these have not proven to
latter term makes obvious the instrumentalization—the organization and use, the techniques that bring forth a technology—of the body that is generally demanded for the production of musical sound that is similarly traced in these histories of the singing body. When we remember that long before it was ever the study of musical instruments, organology was the study of the organs of animals and plants, it becomes easy to plot a line which brings even the human voice—no less the hornist’s sounding mechanism—into the organological domain.67

**Ethics of Instruments, Embodiment, and “Voice”**

Eidsheim explores experimental musical works and the materiality of the voice therein to push even further, to critically examine our naturalized assumptions about how sound inhabits the world; to our received notions of sound as aural, resonant, vibrating air, she returns that sounding is a practice of intermaterial vibration.68 A new organology, as we have seen, places its vital, material relationality front and center; it becomes, as Eidsheim proposes, an organology of intermaterial vibration.

Of course, our understandings and received notions of what instruments are “supposed” to do or be—the power of instrumental imaginaries and “instrumentalities”—reifies and even creates the facticity of instruments, of sound, of music. That is, there is a thickness to musical practice beyond the actuality and actions of material into the virtual that both stems from and works back upon the level of discourse and experience.69 To this end, Dolan and historian of

supplant H-S as the primary categorization system. See Kartomi, *On the Concepts and Classifications of Musical Instruments*.


68 Eidsheim, *Sensing Sound*.

69 Ibid.; Davies, *Romantic Anatomies*, 7: “Instead I define voice neutrally, as vibrating air, but vibrating air that is recognized as particular political and physical articulations of body.”

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science John Tresch devised an model “ethics of instruments” at work behind any episteme of music—or science, for that matter, since both use instruments, are *instrumental* in that these objects are understood to provide a material infrastructure for their practice. Their proposed four-fold model is drawn from Michel Foucault’s ethics—based in his work on technologies and techniques of the self, and the archaeologies and genealogies of knowledge—along with Epicurian and Stoic ethics. By analyzing the contours of the various relationships we have with instruments in a given context, we encounter the modes of *human* conduct and freedom they permit, connecting or networking the user not only to knowledge, but to the cosmos, to nature, and to others; hence why Dolan and Tresch grant instruments not only an epistemological profile, but an *ethical* one.

The first aspect of analysis is (1) the *material disposition* and configuration of instruments. Where in positivist organology, the material boundary is limited to “the instrument itself,” in this project, the horn is not merely limited to its metallic technological elements; rather, the instrument is understood to include the lips (as a transducer of wind energy into sound) and body of the player as (at the very least) essential factors in making it sound. The second category of analysis is (2) the instrument’s *mode of mediation*: “whether its action is considered to be autonomous or passive, modifying or transparent, hidden or visible.” We have already observed this category at work: under the regulative work concept, instruments are to be passive mediums of input from their executants, who are in turn transparent mediums for the control of the composer, for the performance of musical works. Though absolute music leans

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71 Ibid., 278–81.
72 Ibid., 284.
absolutely on instruments for its ineffable transcendence, instruments and the bodies that play them threaten gnostic contemplation if they become too visible or audible.

The third category (3) is the *networks and maps of mediations* that govern the instrument; these include the materials they are understood to work upon—or that work upon it—as well as the rules of conduct that govern its use; and the fourth is (4) its *telos*, the ends to which it is put, including its social contexts and political, economic, social, or cosmological goals. My focus in this project will be upon the orchestral horn—the instrument as it was collected into the orchestra in the eighteenth century and developed through the prerogatives and technologies of Western art music since—though I will expand the display at times to include other types of horns, generally understood as ancestors, and other musical objects with material or musical filiation. Regarding its *telos*, like all instruments, the horn has particular imaginaries associated with it which have shifted and nuanced over time; the most salient of these for modern listeners sedimented in the nineteenth century. For the Romantics, the horn became an instrument of absence and interiority, the sound of nostalgia and memory. Yet, as we will observe in the second chapter, the ends to which an instrument is put or where it is located in a network can push back upon other categories within the ethics of instruments, redrawing even the material dispositions of the instrument itself.

In western instrumentalities, instruments are generally figured as extensions of the body of the user and his or her “voice.” For example, David Burrows writes that an instrumental performer:

rejects the resources of the interior of the body used by a singer in favor of an interaction with an object outside himself. In either case, whether singing or playing the clarinet the performer, by focusing and concentrating his breath, animates the space around
him with what is literally an expression, a pushing outward of his energy. But in playing the clarinet the performers holds his breath in his own two hands where he can work on it and shape it out in the open, in full view of anyone who cares to watch.73

As the performance- and material-focused literature demonstrates, our relationship with these objects in the musicking space not only shapes our expression, but mediates our relationships with musical sound and practice, and with the world.74 This kind of relationality can be understood as weakness in an ethics of instruments whose telos is the transparent embodiment of transcendent musical works; on the other hand, as Benjamin Piekut suggests, the density of these entanglements might be, in fact, music’s strength.75 From this view, “music” is a glossy label for the thick event of intermaterial, interpersonal vibration—doings and doings-with—that occurs among actors, human and non-human.76

Unlike earlier comparative models, such as those of Hornbostel and Sachs, I do not seek to pin the horn down into a single location; rather, I embrace the instrument as “alive and dynamic, indifferent to sharp demarcation and set form,” and move with it as it proposes its own affiliations in the repertoire, and allowing the “realities of [its] material”—broadly defined—to “sharpen [my] perception” about music, sound, instruments, and, of course, bodies.77 More accurately, my focus is not the “horn itself,” but rather the hornist. I understand the instrumentalist as both the instrument and the player that makes it sound, realizing individual and

74 Though I have opted to retain the simple term performance, it is of course not a simple term at all. Diana Taylor proposes the neologism performatic to describe knowledges of or approaches to performance, as performative has distinct, historied meanings in sociolinguistics (J.L. Austin’s notion of performative utterances: words that “do” what they “say”) and gender studies (from Judith Butler’s performativity: the notion that gender is performed and enacted). Taylor, Performance, 117–31.
mutual potential for sonification, which gives rise to a voice. Thus incorporated, an instrumentalist is an assemblage, a fluid configuration of the human and the non-human, the vibration of organic and inorganic materials and forces that appears through the coordinated musical action of instrumental and bodily technicities—both technologies and techniques. This project’s archeology of instrumental incorporation finds productive slippage in concepts of bodies as technology and instruments as bodies, in anthropomorphisms and technomorphisms, and assumes even the analog, acoustic instrumentalist as always-already bound up with technology, shot through with it: a cyborg.

In philosophy, embodiment refers to the experience of the lived body in and with the world, the sensational, perceptual, “pre-discursive” body of phenomenology and cognition. Phenomenology is the study of structures of consciousness as they are given us through the world; in the twentieth century, phenomenologists such as Husserl, Heidegger, and Merleau-Ponty came to posit the body—in contradistinction to the Cartesian mind—as the primary site of engagement with the world, the grounding of existential self. The body is the means by which we have a world (or a music) at all, and it is how the world (or the music) has us. Subjectivity and consciousness are thus always bound up with the gestures, phenomena, and objects of the world.

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78 For more on assemblage, see Jane Bennett, Vibrant Matter: A Political Ecology of Things (Durham: Duke University Press, 2010), esp. 1–38.
79 The label ‘inhuman’ applied to techniques simply overlooks translation mechanisms and the many choices that exist for figuring or defiguring, personifying or abstracting, embodying or disembodying actors. When we say that [technologies] are ‘mere automatisms,’ we project as much as when we say they are ‘loving creatures’; the only difference is that the latter is an anthropomorphism and the former a technomorphism.” Bruno Latour, “Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts,” in Shaping Technology, Building Society: Studies in Sociotechnical Change, ed. Wiebe Bijker and John Law [Cambridge, Mass., 1992], 225–58, on 241; cited in Dolan and Tresch, “Toward a New Organology,” 285. The notion of the cyborg is most famously associated with Donna Haraway’s cyberfeminist essay Donna Haraway, “A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century,” in Simians, Cyborgs and Women: The Reinvention of Nature (New York: Routledge, 1990), 149–82. See also Gordon, “The Castrato Meets the Cyborg.”
shaping them and it and, in turn, being shaped by them. Instruments and bodies are not mediators of a disembodied “music”—they are music, through and through.

Instrumental performance, as Burrows states, always takes place in prepositional relationship to our musical tools before or at the same time as any other relations music may choreograph. We have seen strains of this in the performance literature: at the cello, Le Guin is in carnal relationship with Boccherini; on the organ bench, feet across the pedals, the Word is made Flesh and Cusick receives grace from Bach himself. Philosopher and musicologist Peter Szendy describes this distribution of the self between body and instrument—and ultimate connection to others—as “musical body-to-body contact” (corps à corps). “When, at the keyboard, ‘I embody’… when the bodies espouse one another—the resonant and multiplying body of the instrument but also the bodies of all those who will have left their traces on the claviature—’I’ would already be exposed to the crowd. ‘I’ would already be, in the body-to-body contact, a group formation of two members.”

We have intimate relations with our musical tools: at times, they feel like trusted friends or seem to merge into our bodily schema as a prosthesis or implant might, and we become one. Through the somatic sensations that our actions at these instruments bring forth, performers are brought into relationship with the world. Thus the knowledges cultivated by musicology’s technophilic material turn can always be read back onto and alongside the body, not least because music has always been material and bodily, even when it is denied under transcendent rationalist ethics of instruments. Music theorist Jonathan de Souza’s book Music at Hand uses

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80 For a review of these major lines of thought, see Carrie Noland, Agency and Embodiment: Performing Gestures/Producing Culture (Cambridge, MA: Harvard University Press, 2009).
82 Szendy, Phantom Limbs, 158.
his first-hand knowledge as a multi-instrumentalist to examine the relationships between bodies, instruments, and human cognition.83 Through habituated practice and the instruments’ particular mappings of musical space, instruments such as the piano, violin, guitar, and harmonica coordinate dynamic, particular, and individualized musical bodies and minds to make possible styles and musics that are, because they are grounded in habituated instrumental coordination, always-already idiomatic. His final chapter examines the horn, but from the perspective of aesthesis, as a listener, and the technologies and techniques of the horn remain at a certain experiential distance, sounding from over there. I make gestures to close that gap.

Another approach to embodiment understands the body of the subject as an object of power and a technology of the self. Countering the disembodiment of music established under the work-concept and Werktreue, which accelerated with the advent of mechanical recording and electronic broadcast, and its effacement of the mundane, the critical, “new” turn in musicology recovered socio-historical contexts of encounter (perhaps another sense of “interface” than typically evoked in technocentric approaches). Concert performances and other practices of musicking have been read as rituals of social construction, organizing participants into socialized musical subject positions—such as composer, performer, and audience—but also reinforcing or reperforming classed, gendered, and other identities.84 Instruments of the orchestra, too, have politicized identities that play out in musicking space: as Dolan’s work on orchestration demonstrates, as instruments became constituents of the orchestral polity, they were granted voice as free subjects in the organized body of civil society.85 But as the orchestra and its building up became standardized and codified through treatises, it became conceived as the

83 De Souza, Music at Hand.
85 Dolan, The Orchestral Revolution.
sounding apparatus of a giant keyboard that the conductor telekinetically “played” to realize the composer’s vision; the instrumentalists of the orchestra become parts of a hyper-instrument which can only sound “the composer’s voice,” autonomous and singular.  
Many of the performance-based readings cited above think primarily through solo repertoires and eschew the coordination of multiple instrumentalists. The hornist, by contrast, is most often found in ensemble; yet, while often homogenized into a “horn section,” the hornist knows of the differentiated voices, individual roles, and responsibilities of each of its constituents.

While these corporealities can often be creative and artful, our relations with instruments, with our bodies, with ourselves and with others can also feel, at times, antagonistic. The “group formation of two members”—or the workings of the incorporated ensemble—articulates itself in intersubjective and intercorporeal negotiations, body-to-body. Indeed, Szendy’s formulation of musical incorporation as corps-à-corps maintains the sense not only of contact, but of melee, of man-to-man combat. De Souza describes practices of “voluntary self-sabotage,” where the instrument is intentionally manipulated to invite new bodily approaches and musical experience; in this regard we can recall the spectacle of Ben Heppner’s broken instrument.

As such, musical embodiment is not always a pleasant experience: instruments can cause pain or damage to the body, marking and scarring our flesh; similarly, our labor breaks down our

86 Ibid., and Szendy, Phantom Limbs.
88 De Souza, Music at Hand, 83–108.
instruments as their vibrating and resonant bodies shake. Like the Heppner upon which Abbate aurally gazed, brass musicking can drastically, even painfully reveal its limits in epistemologies and phenomenologies of music couched in universalist, transcendent terms. At a most basic level, brass instruments can be seen as limited in access to musical material, in executional speed and accuracy, in terms of stamina and in the basic need for the sound to stop in order to take a breath. These boundaries point not only to the limits of the human or technological body, but moreover, its inevitable, ultimate failure. Instruments malfunction, our bodies tire. This is the peril of performance, of an admittedly material music: inexhaustible music is a myth, for sound and breath ultimately die, and music’s ultimate ephemerality can remind us of our own.\(^89\) In other words, brass musicking can—and often does—give voice to the very fears that lead to a “mind-body problem” in the first place. Additionally, brass instruments are often heard within a narrow intensive band—“loud”—that limits their contexts of musical participation under listening practices that increasingly value interiority for the composer and listener. Paradoxically, the invisibility of the sounding mechanism invites a kind of acousmatic reduction, divorcing musical sound from its materiality by keeping its sources hidden from view, bodies and instruments out of mind.

I do not claim these conditions as unique to the hornist’s musicking. Rather, attention to the particulars of any specific instrumental mediation intensifies the edges of Werktreu-based musicological approaches. The horn and the body that meets it here function as case studies, specimens, boundary objects.\(^90\) It cannot always parrot back the musical utterance of the

\(^{89}\) For a critique of music’s theoretical inexhaustibility, see Amy Cimini and Jairo Moreno, “Inexhaustible Sound and Fiduciary Aurality,” Boundary 2 43, no. 1 (2016): 5–41.

\(^{90}\) Inasmuch as I plunder the historical curiosity cabinet, this project is at times demonstrative of “quirk historicism”; moreover, I consider that the horn both is and is not central to Western serious musicking practice, always operating on the periphery of the fluently musical and the merely mundane or “extra-musical.” See essays in Nicholas Mathew and Mary Ann Smart, eds., “Special Forum: Quirk Historicism,” Representations 132, no. 1 (Fall 2015): 61–129.
composer. “Performance, however, is not limited to mimetic repetition,” writes Taylor. “It also includes the possibility of change, critique, and creativity within frameworks of repetition.”

These limits of musical autonomy and agency point back to the lived experiences of the socially- and culturally-specific, but ultimately always underdetermined body taken up in critical theory, particularly as articulated in feminist phenomenology. The performative and material turns were, in fact, largely inaugurated by the interventions of feminist and other minoritarian perspectives in projects of knowledge making, including critical race theory, colonial studies, and, more recently, disabilities studies. Indeed, for Cusick the performative turn in music is already feminine because the feminine is always bound up with the body, where the unmarked masculine is associated with the musicking mind; and for Taylor, performance’s ephemerality—its “‘disappearing’ even as it comes into being”—resists the “laws of the reproductive economy.” While there are real consequences for musicking from marked, minoritarian positions, the body I describe at the mouthpiece is generally not a specifically, socially marked one in larger society, in the world *out there*. Rather, the interventions I glean from critical theory are those that name the unnamable, that make *all* bodies subject to power that is both everywhere and nowhere, and that seek to make intervention by analyzing the contours of interaction in always-already socialized, always-already politicized space.

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92 Cusick, “Feminist Theory, Music Theory,” esp. 15–6; Taylor (also citing Peggy Phelan), *Performance*, 10
93 See, for example, Tracy McMullan, “Corpo-Realities: Keepin’ It Real in ‘Music and Embodiment’ Scholarship,” *Current Musicology* 82 (Fall 2006): 61–80. McMullan examines the experience of Abbie Connant, a woman who, despite having unanimously won a blind audition for principal trombone with a European orchestra, was ultimately pushed out of the position because it was felt that women generally lacked the adequate breath function and stamina. This fact is not born out by medical testing, as Connant tested above the average man on these parameters, and on par with her (male) colleagues. She ultimately left the orchestra.
I take here Philip Auslander’s extension of Cook’s reframing of scores as scripts that refocused attention from composers to performers, to which he adds that “the direct object of the verb to perform need not be something—it can also be someone, an identity rather than a text.”94 “To be a musician is to perform an identity”—what he calls a personage or persona—“in a social realm” that is called into being in musical performance.95 That is, the identity to which I attend is that of “musician,” and here, the marked identity of the “hornist,” in the musicosocial space within and beyond a given work, always realized in performance. This identity is contoured by both the material facticities of horn and body that ground subjectivity and by the discursive technologies—our ethics of instruments, the regulative work-concept, but also those of larger society, governmentality, discipline and biopower, embodied experiences of pleasure and erotics, action and sensation—that afford and govern the hornist’s performance.

Musical instruments are understood to shape and extend the gestures and expressions of bodies into musical “voices,” and, in fact, almost any object or body can be sounded and thus “envoiced.”96 This realization reconnects instrumental praxis and poiesis to voice studies, the interdiscipline which takes the “voice” as both material and metaphor for participation, agency, and freedom, even as it “inclines always toward alterity.”97 A singular concept of voice, however, is insufficient; as Adriana Cavarero and other feminist thinkers remind us, the voice is

95 Ibid.
always multiple. No matter how perfectly formed in the image of its ancestors, every instrumental body is, at every moment, unique. Rather, this project challenges univocal concepts of music and of instrumental sound by engaging with the hornist as a contingent and polyphonic incorporation. The hornist is—at every level—multiple, intimate, intercorporeal encounters in slippery spaces between bodies and technologies, in shifting technicities coordinating intermaterial vibration; she is articulated and recomposing, dismembered and remembering, organized and organizing for the cultivation and performance of her voice.

A Partial Perspective

With the exception of orchestral and select chamber works, brass musics, techniques, and pedagogy are largely not considered in the historiography of music and often misrepresented or misunderstood. Even the instrumental technology has only a marginal presence in the publications of the Galpin and American Musical Instrument Societies. I consider that the limited “degrees of freedom and teleologies” granted brass instruments in the typical spaces and modes of music scholarship may, in fact, ultimately reveal liminal, emergent modes of musical performativity and contours of musical sound beyond the omnipotence of the singing musicus, the virtually envoiced composer, or the autonomous keyboard. This project is sourced in a drastically-encountered, historically contingent, instrumentally-marked and -limited subject position—the hornist—at work in a musical and academic culture that values autonomy, transcendence, and “gnostic” detachment. My work remains grounded in “works” because they

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are what interpellate the hornist and bring her forth into being. But I use works as boundary objects, too. For works, horns, and bodies are here ultimately objects of inquiry in the thick event of music’s intermaterial vibration that connects performers and listeners, bodies and instruments: my subject is the phenomenology of knowledge practices of music and, inasmuch as musical space is social space, ultimately life itself.

My issue with the Hornbostel-Sachs nomenclature is, I must confess, ultimately partial, following Donna Haraway’s 1988 essay “Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective.” I am an example of *homo sapiens* with two lungs, two lips and other maxillofacial tissues long instrumentalized into a coupling mechanism called *embouchure*, endowed with five digits on her left hand, who regularly presents to and moves in the world articulated to a specimen of H-S class 423.232, a (423) “trumpet” type aerophone (.2) made chromatic (.23) by means of the addition of valves, and (.232) of fairly conical bore.

I am a performing hornist, and my relationship with my instrument is not simply one of subject and object, knower and known, nor is my instrumentality a means to an end. It is, in the sense of Haraway’s writing, the embodied, situated, and partial perspective from which I speak,

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99 Cf. Auslander’s critique of Cook, “Musical Personae,” 101: Cook’s “positing of the musical work as that which is performed ultimately leads to a privileging of the work, now renamed as a script, which remains consonant with that tradition.

Another problem that arises when the question is framed in terms of work and performance, process and product, is that the important relationships are between abstractions rather than human beings. The concept of performance thus becomes curiously disembodied and participants are deprived of agency. In Cook’s description of the Mozart quartet, for example, the script is the grammatical subject that choreographs the players’ social behavior. As a result, both the composer’s agency as the one who created the script, and the performers’ agency as those who embody it through actions and gestures—and who undertook, for whatever reason, to play it in the first place—are left out of the picture. The audience is not mentioned at all.”

and this in-corporation—body-at-instrument, cor à corps—is where my project of knowledge production begins and returns. It is thus not only a musical instrument, but also my technological enframing: it is also like a scientific instrument, priming and extending my sensory capacities and my “vision” of music in particular ways, but not always in step with formalist approaches to music built upon the monologics of patriarchial rationalism.

There is a tension in this retained framing, which I cannot articulate better than Cusick did:

The central core of my musicality is performance, an identity so strong that I can barely imagine what other musical identities people (especially critics) might have. As I began to think from the performer in myself, and not from the musicologist in her, I felt acutely that I was not supposed to be thinking that way… As a performer, I act on and with what we ordinarily call music with my body; as a musicologist I have been formed to act on (and with?) what we ordinarily call music with my mind, and only with my mind.¹⁰¹

I first learned to love music alongside my horn, as a hornist, body to horn, breath to tube-air, and, to some extent, my experiences of any and all music are conditioned by my musical identity, even as I listen, as I write. I do not seek to—here I strive to not—separate the hornist from the musicologist nor the musicologist from the horn. Rather than attempt the detached gnosticism demanded of those that would engage in the science of the tonal arts, my approach insists that our initial, sustained, and most intimate experiences of music—for many of us, the drastic practice of music seated at the piano bench, bow in hand, throat in song, performing our part within an ensemble—constitutes a local and locatable knowledge and conditions our musical being-in-the-world. That which I write about here, then, is always a doing and a doing-with; a specific instrumental embodiment becomes a musical habitus from which ultimate

transcendence is not fully possible, but instead can be understood through critical reflection, held accountable, and yield productive boundaries. It is only through the collected and collective vision of these partially knowing selves, as Haraway writes of scientific knowledge, that we might ever get at a full sense of what music might be.\textsuperscript{102}

From the partial, embodied perspective, Haraway says, “we just live here and try to strike up noninnocent conversations by means of our prosthetic devices.”\textsuperscript{103} I do not seek gnostic, transcendent truths; I seek that which is organized for and around the aperture of my embouchure, generally illegible behind the mouthpiece and submerged in the ensemble. The horn, however, is not merely an extension of my musical voice; rather, “alive and dynamic,” instrument and air impresses upon and within me in musical encounters where metal meets flesh and is experienced in pressurized resistances, nodes, and anti-nodes. Together we become hornist, interpellated into musical subjectivity through invitation into the concert hall, collected into the orchestra, re-membered and disembodied through instrumental technology and the ideologies of Werktreue and scientistic rationalism. With sensibilities tuned through and toward the drastic aspects of performance with the horn, my concerns do not always align with those of formalist practice. My attention is drawn to intercorporeal microchoreographies of gesture, timbre, and intonation, in the moment-moving negotiations that I experience daily, through musical practice, as part of my being-in-the-world.

When bodies become instrumentally organized and instruments have resonant and anatomical bodies, we consider: Where is the body in, at, or with the horn as it sings? But also: who or what is granted what kind of body, and under what conditions do we grant them voice? Elsewhere, Haraway aligns the partial perspective with practices of “modest

\textsuperscript{102} Haraway, “Situated Knowledges,” 582–3.
\textsuperscript{103} Ibid., 594.
witnessing.”¹⁰⁴ “Witnessing is seeing, attesting; standing publicly accountable for, and physically vulnerable to, one’s visions and representations. Witnessing is a collecting, limited practice that depends on the constructed and never finished credibility of those who do it, of whom are mortal, fallible, and fraught with the consequences of unconscious and disowned desires and fears.”¹⁰⁵ Musical corporealities and incorporations ask us to recognize not only bodies—organic and inorganic, human and technological—but also to question the ethics and politics always already deeply embedded within our classificatory impulses and epistemological methods.

Whether musical or scientific, instruments provide a means to extend the capacities of the eye, ear, voice and boundaries of the lived, perceiving body. An embodied partiality recognizes its limits and the situating perspective of its technologies of vision, and takes on particular valences and productive compromises in 423 musicking.¹⁰⁶ Labial sputterings are funneled into the approximate partials of the harmonic series rather than neatly organized and theorized diatonicisms. The cycle of breath coupled with the instrument yields hesitant entries and cracked notes—all too mundane and regular reminders of risk and peril. Bearing modest witness to these drastic ruptures removes us from the gnostic omnipotence of the “god trick” and acknowledges the ephemerality of performance, which in turn becomes, perhaps, the sound of our own vulnerability and death. But if, in Haraway’s words, “immortality and omnipotence are not our goals,” bearing witness from within the risky and moving boundaries of our always partial perspectives reveals our limits and fears but may also rehearse our capacious abilities to live with dignity and the affordances to craft a world anew.¹⁰⁷

¹⁰⁴ Donna Haraway, Modest Witness@Second Millennium. FemaleMan Meets OncoMouse: Feminism and Technoscience (New York: Routledge, 1997).
¹⁰⁷ Ibid., 580. “We need the power of modern critical theories of how meanings and bodies get made, not in order to deny meanings and bodies, but in order to build meanings and bodies that have a chance for life.” (Ibid.)
Project Overview

This project is organized into a series of four work-based case studies from the hornist’s repertoire; in each chapter I examine that work’s choreographies for a different—but always instrumental, always bodily—facet of hornistic performance and consider its implications for musicological study. These works were selected for their notoriety and salience to both horn players and to musicology writ large, as well as from sheer circumstance: these are works that I encountered as a performer during my doctoral studies. Repetition in the practice room and rehearsal space—with a horn in my hands—was both augmented by and foundational to my work at the writing desk once the horn had been set in the corner in favor of a book. I can just as easily reverse the formula, and grant that my work at the writing desk was augmented by and foundational to my work on the horn once I picked it back up again.

In the process, these “works” are reinvigorated as performative repertoire—musicking work rather than musical works—as sites for underdetermined corporeal encounters, as choreographies of players and instruments, human and non-human bodies, as well as negotiations between musical sound, linguistic discourse, and what it is that we think we know about music.

In the first chapter, I take as my case study the first movement of Beethoven’s Eroica Symphony (1803). I examine common readings—supported by Cone’s attention to “the composer’s voice” and the related “composite musical persona”—that figure the movement as the journey of a singular, ultimately autonomous hero; this mode of attention is facilitated or afforded by what Goehr described as the regulative work-concept, similar to Abbate’s gnostic mode, that coalesced and gathered force in the early nineteenth century.
To counter the omniscience and transcendence typically assigned to this monumental musical work, I take a “partial perspective” from the three horn parts, revealing multiple and collective drastic agents at work in the collective orchestral organism. By taking each part in turn, I examine the affordances of the horns for which Beethoven wrote, which give rise to renewed consideration of instrumentation and the role of timbre in articulating form and melody, of the almost always extra-musical remainders that attach to the horn, and of the ultimate immanence of the hero—and music—in collective sounding.

In the second chapter, I examine shifts in the hornist’s technicities in the nineteenth century by means of Brahms’s Trio for Violin, Horn and Piano (1865). Famously, Brahms asked that the work be performed on the natural Waldhorn, and not the new Ventilhorn (valved horn), which had come to replace the older instrument by mid-century. Where musicological commentators typically cite Brahms’s personal nostalgia and the Romantic horn’s status as an “emblem of distance” as his rationale, I propose that we attend more closely to the material distinctions between the two in chamber musicking space.

The Waldhorn’s melodic techniques—using the player’s hand—created a crucial shift in the instrument’s timbre, a cherished “grain” in the horn’s voice that is not legible from the score; these bodily interventions were, I suggest, that which made the horn so ideally Romantic in the first place. Despite resistance from Brahms and others, however, the Ventilhorn was the ultimate victor under industrial imperatives that demanded full control and exhaustion of instrumental resources. Thus the audible presence of the body in the hornist’s performance was, I argue, silenced by the valve’s mechanization of the instrument and the player, which created a new “romantic anatomy” of the hornist that, paradoxically, allowed for the body’s erasure from
melodic production, the dismemberment of timbre from music, to realize the dream of an incorporeal music.

In chapter three, I use a solo work by Olivier Messiaen (1974) to examine the “essential acoustic factor” for the hornist and all labrosones: the lips. I introduce the reader to their own potential for labrosonification, which locates a musical voice in the trained embouchure at the surface of the body. I then employ Brian Kane’s diagnostic model of the voice to examine the concept of the composer’s voice at work in embodied analysis: through bodily co-location with the composer, analysts can claim an unparalleled access to his voice. In the process, voice becomes as much about expression as it does impression, action and reaction, when it is organized around, or as, an instrument.

Messiaen, however, was not a hornist; rather, his solo work, an “Interstellar Call,” connects the hornist to myriad other voices and other oralities: to the bird song, to the baby’s babble, to the long history of the signal horn’s call and horning, probing how and to what we attend when we grant musical voice.

I return to the idiom of the horn trio in the final chapter to consider the hornist as a somatechnical subject at work in the chamber musicking space. While Ligeti’s Trio (1982) is often read for its harmonic and structural components, Ligeti indicated that a crucial component of the work is the clash of tuning systems afforded by each of the instruments, signaling the importance of intonational events and negotiation in the work and the aestheticization—and alterity—of techno-corporeal difference. I consider how disabilities studies might inform
organological embodiment and technological subjectivity, where intonational instrumental affordances are often coded as temperamental (dis)abilities.

By choreographing tacit and explicit intercorporeal facilitations and contests—as well as moments of rejection, abjection, and acceptance—I suggest that Ligeti’s Trio presents a disability aesthetics of temperamental idiolect andcripped fluencies in musical space. Moreover, with relational attention and attunement to material limits, the instrumentalists engage in an “embodied ethics” of care, and musical performance can be a rehearsal for living, or for the world to come.
CHAPTER ZERO

BASICS OF BRASS INSTRUMENTS, or, PARTIALITY

The most basic horn is a simple tube made of animal bone, wood, metal, plastic, or any number of other materials, upon which one end is blown by the player. Like all blown aerophones (H-S class 42), the tube contains a standing column of air that is set into vibratory motion when it is blown.¹ The horn differs from other 42 aerophones in its manner of activation: flutes (class 421) use a jet of air flowing across an edge of the instrument, clarinets and oboes (class 422) use a single or double reed made of cane or plastic. Trumpets and horns (423) are lip-reeds or lip-activated aerophones: rather than a separable mechanical reed that can be attached to the instrument, the player’s lips—or part of the lips—are what periodically open and close at a small opening called the aperture as the player blows. The regular, cyclic pulsation at the aperture sets up consistent waves in the standing column of air in the instrument’s tube to create sound.

Cyclically vibrating lips can create sound on their own, colloquially referred to as a buzz, without being attached to an instrument.² A specialist can train their lips and supporting musculature of the face, collectively referred to as an embouchure, to create highly predicable and controlled buzzing at a number of frequencies. We will examine the mechanics of this embouchure in more detail in the third chapter. Even the non-trained specialist creates a relatively low frequency, slow oscillation of the lips when they blow through their mouth with

¹ With aerophones we typically do not hear a mechanical component of the instrument directly; generally, we hear the pulses in air that has been set into motion this way. That is, what we hear is the tube air in cooperative oscillation with the lips, not merely the lips themselves. The exception is at extremely high frequencies above the reflective cut-off frequency, where the wave simply passes out of the instrument rather than being reflected back into it. If the fluctuating air is not contained in a tube, this is a “free aerophone” (H-S class 41, such as with the harmonica, the siren or whip, or, hypothetically, a buzz without instrument or mouthpiece, called a “free buzz”).
² The term embouchure is also the French word for the instrumental mouthpiece.
lips slackened and loosely closed, such as we (or perhaps a horse) might in frustration or
exhaustion. The musical utility of this unconscious, nondirected behavior, however, may not be
readily apparent to the tired blower; another way of saying this, from the perspective of an
ecological psychologist or designer, would be to say that the loose-lipped exhalation does not
generally afford—supply, provide, grant, or offer—useful musical sound. Of course, while
sitting at a desk, we do not need this physical and sonic gesture of exhaustion to be musical;
rather, we value the release of tension in the face or the expression of our exhaustion to another
animal in our environment—it affords physical relaxation and/or communication.

Organologist Jeremy Montagu suggests that the first lip-vibrated aerophones may have
been discovered when an ancient human found conch shell upon a beach, and the loose-lipped
blow at a broken-off tip afforded the removal of a bit of water from its interior.3 When so
coupled, the vibrating lips can be guided to natural resonances of the tube—nodes—setting up
what acoustic and other fluid physicists call a cooperative regime of oscillation, and a new sound
erupts with the potential to travel farther than the lip blow of the player, or even their voice,
affording sonic extension across great distances. Ecological psychologist James J. Gibson coined
a noun form—affordance—to describe the properties of an object or aspects of the environment
that are useful to the animal. These properties do not merely inhere in the object, but arise from
their directed use in the natural and cultural environment. Thus the protective exoskeleton of the
mollusk can become the domicile of an insect, armor or a weapon when held in the hand of a
Mayan warrior, decoration for a Bengali bride, or, when coupled with a cyclic lip vibration, a
trumpet for a Hindu priest or a Grenadian fisherman. Thus, depending on who is wielding the

shell and in what context, the conch shell’s affordances include protection in defensive and offensive modes and allure in the visual and sonic.

For any blown aerophone, the fundamental frequency is determined by the length of the tube (and hence the length of the sound wave that can be established in it). The conch shells used for blowing, for example, average about 30 inches of tubing contained within the helical spiral, and so sound somewhere around the G above middle C, though Montagu cites examples that extend almost an octave lower. For Western orchestral brasswind, tube lengths range from over 24 inches (62cm) for a piccolo trumpet to about 18 feet (563cm) for a contrabass trombone or tuba, both sounding B-flat as the fundamental, albeit offset by several octaves. Often, a single pitch has been adequate to communicate messages of some complexity across great distances: this has been the case with many conch trumpets, fox horns, and other sonic signaling technologies, such as with Morse code.

But these instruments can afford further, higher pitches if the player adjusts lip tension and air speed to create faster vibrations at the aperture to meet other modes of resonance in the instrument. While this is quite difficult on very short instruments, in the case of modern Western orchestral brasswind, through careful shaping of a long, unbroken tube, the mouthpiece (which acts as a coupler to control and direct the lips’ vibration of the lips and air flow), and a flaring bell section at the end of the tube, the instrument’s natural resonances above the single fundamental pitch are brought into ratios very close to those of the harmonic series, and because of the length of the instruments, become relatively easy for the player to activate.

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4 Ibid., 4.
5 For instruments not built to such exacting specifications, the natural resonances will nonetheless be arranged in a series of gradually diminishing intervals, but not necessarily those of the harmonic series.
Example 0.1 shows the harmonic series of a C fundamental with wavelength approximately of about 17 feet in length (527.47 cm); this pitch is the same as the second lowest C on the piano, or the lowest string on a traditionally tuned cello. This fundamental is available on an instrument of approximately 8 feet in length (the length of a natural C trumpet or a horn in C alto). Theoretically, the harmonic series can continue upwards ad infinitum in ever-decreasing intervals; in practice, the human ear stops perceiving sound over 18,000Hz (or over 20,000Hz in the case of very healthy young people), and the lips of the instrumentalist peak at about 3,500Hz, which approaches the top of the piano’s range and of appreciable musical sound more generally.\(^6\)

Before we turn to the specific qualities of the series, it is important to remember that the harmonic series is present in various proportions in any single pitched sound through synthesized hearing of the individual harmonics over the fundamental frequency, also called overtones (as they sound over the fundamental). This harmonic spectrum is what gives rise to characteristic instrumental sound. More specifically, what distinguishes the sound produced by the horn from that of the trumpet is the shape of their tubes.\(^7\) “Trumpet-types” are of generally cylindrical bore—that is, the inside diameter of the tube stays relatively consistent for the majority of their

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\(^6\) In fact, because the wavelengths become shorter than the diameter of the tube, the instrument stops reflecting the sound back—no longer creating a standing wave—and instead these high frequency pitches simply travel almost unidirectionally out of the instrument. In effect, we no longer hear the composite instrumentalist, rather, the instrument can become a megaphone for the vibrations of the player’s lips alone.

\(^7\) In the original presentation, H-S uses the visual form of the instrument to distinguish between trumpets (straight) and horns (curved or folded), but this is not of particular acoustic significance. For this reason, revisions to H-S often differentiate by bore shape. See Appendix A.
length, in the shape of cylinder—where “horn-types” are more conoidal or conical, gradually flaring from the blown end. As with all aerophones, the shape of the tube is responsible for the general timbre of the instrument: the cylindrical tube of the trumpet, trombone, or clarinet favors certain frequencies in the harmonic spectrum, lending a “brightness” to the sound, where the conoidal tube of the horn, tuba, or oboe has a more gradual distribution through the harmonic spectrum, resulting in a more complex and “darker” sound. (We will examine creation of horn timbre more fully in the second chapter.)

The harmonic series is especially crucial in musicking because this is also how lip-vibrated aerophones transverse melodic space: by varying lip tension and air speed alone (and not modifying the length of the tube in any way, as is the case with “natural” trumpets and horns), the simple tubes afford pitches at the natural resonances of the tube. Brass players call these *partials*, and in a properly shaped Western brasswind instrument, these partials are an extremely close approximation to the harmonic series.\(^8\) Another way of saying this comes in the form of technē—technological knowledges—that the harmonic series is what a horn “knows,” musically. A hornist, then, can refer to numbered partials as points in the instrument’s topography, numbered locations in the instrument’s space: the first partial is the fundamental of the horn, the second partial the octave above, and so forth. Returning to example 0.1 with partials

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\(^8\) Brass players will use the terms *harmonic*, *overtone*, and *partial* somewhat interchangeably to refer to the members of the harmonic series. To be precise, *partial* (from “partial wave”) refers to the constituent sine wave elements of any complex sound, both harmonic and inharmonic components; *harmonic [partial]* refers to specifically those partials which are harmonic—that is, partials whose frequencies are whole numerical integer multiples of the fundamental, including the fundamental; and *overtone* is any frequency greater than the fundamental, whether harmonic or inharmonic. I have elected to use the term *partial* for its distinction from other musical terminology—that is, to save the reader from the time-consuming task of determining whether I am using the adjective or the noun *harmonic*, or even *harmony*. I have included in this figure, then, the first sixteen partials of the harmonic series. Moreover, the term is more accurate: in the case of untuned instruments such as a digeridoo or a merely decorative trumpet or horn, these partials may not be aligned with the harmonic series—that is, the first pitch available over the fundamental (the first overtone) may not be an octave.
labeled above, observe that the frequencies of each member of the series (below) are spaced at equal intervals—each harmonic is a whole number multiple of the fundamental frequency. (In the case of the ‘8-foot’ C series, each partial is 65.41Hz away from the next member.) When a frequency is doubled, we reach a new octave. Between these doublings, however, the intervals get increasingly smaller—finer and finer tessellations of the octave—as we ascend. Thus, the melodic affordances of a horn without valves—such as the orchestral horn available when Beethoven composed the Eroica—are quite distinct from a piano, which affords division of the octave into twelve parts throughout its compass. Compared to the regularity afforded by the piano’s interface, the horn presents an archetypical example of irregular pitch space, where consistent steps in the tube’s instrumental space (the movement from partial 1 \([p1]\) to partial 2 \([p2]\), compared with \(p2\) to \(p3\)) yield variable pitch intervals (an octave, a fifth).\(^9\)

![Figure 0.1. Andrew Waddington and Peter MacDonald, piano keyboard imagined as irregular pitch space.](image)

(Incidentally, this narrowing is partly responsible for the peril of brass instrument performance; imagine playing a keyboard arranged thus!)

The harmonic series and its whole number ratios—particularly the first six partials—are well-known as the source of Western harmonic theory, and nineteenth-century horn pedagogue

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Louis François Dauprat compared the natural instrument to Rameau’s *corps sonore.* The fundamental is actually rarely used in brass musicking: it lacks the strength and timbre that we associate with the instrumental category. The second and third partials in the second octave of the instrument’s compass, however, are often used. In the third octave, the series introduces the major triad (p4–p6), and in the fourth (p8–p16), the series gives way to an almost diatonic scale. This potential for scalar, diatonic motion explains why solo specialists in the late Baroque were trained for especial fluency in the fourth octave and above, with some reports of trumpeters hitting the thirty-second partial; however, once situated within the orchestra, the majority of high brass musicking assumes the sixteenth partial as the functional end-point.

Yet, except for the fundamental and its octave doublings, the tones of the harmonic series do not plot exactly onto standardized—we might say socialized—temperaments, such as equal temperament (ET) with its highly uniform mapping. The fifth partial, for example, is 14 cents low compared to an ET major third (refer to ex. 0.1, with deviations from ET in italics). While this might present a slight impediment for melodic use, it is advantageous harmonically: the flatness of the harmonic major third—p5 or p10—brings it into beatless just intonation above the tonic, resulting in rich difference tones below the sounded pitches. The seventh partial, however, is a full 31 cents flat compared to equal temperament; while this less of a problem for the solo hunting hornist, and even useful in ensemble when tuning a dominant seventh chord built upon the tonic (V7/IV), the partial requires adjustment to be used in most other contexts.

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10 Louis F. Dauprat, *Méthode de Cor Alto et de Cor Basse,* Part I (Paris: Schonenberger House, 1824), 3; translated by Jeffrey Snedeker, “[L.F. Dauprat’s] Méthode de Cor Alto et de Cor Basse,” Part I, *Historic Brass Society Journal* 4 (1992): 168: “Limited, so to speak, to function as a resonant body [*corps sonore*], the Horn has as natural sounds only the Tonic, Mediant, Dominant, minor Seventh, and major Ninth, some doubled, others tripled and quadrupled. These are also, more or less, the only notes which one uses in the orchestra, because they can be modified at will and heard within the masses of the harmony.”
Luckily, instruments sounded through lip-activation are not immobile: the instrument will respond to frequencies that closely approximate its natural resonances. As such, a player can buzz a pitch somewhat flat or sharp and the instrument will nonetheless resonate with it, though with a slight loss of color and tone. This technique is referred to as lipping the pitch, and allows the trumpeter or hornist to sound p5 or p10 (or the even flatter p7) somewhat sharper than the harmonic series, more in tune with the way it might be sounded by a violinist or flautist.

For more extreme cases of non-harmonic notes, such as the minor third over the tonic, there are other options, especially for the hornists. In many minor key symphonies—indeed, in the C minor second movement of the *Eroica*—the composer can call for the horn section to be pitched in two different keys. The hornists—a pair pitched in the tonic and a pair pitched in the minor third above—divide their labor, able to provide harmonic support in the tonic minor as well as the relative and parallel major. In fact, it was exceedingly rare for a four-member horn section to all be pitched in the same key until the standardization of the valved horn in F in the mid-nineteenth century; rather, the section would generally be divided in half by pitch: a first and second horn in one key, and a first and second in another. This is the case in the overture to Weber’s *Der Freischütz* (1824), where the famous quartet begins as duets, first for a pair of horns in 16-foot C and taken up by a pair in 12-foot F in order to execute the cantabile melody. Later, in the Wolf’s Glen scene (no. 10, Act II Finale, mm. 336–46), Weber scores for a horn in B-flat, one in F, and a pair in E to use the stable tones available in the harmonic series—p10, p8,

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11 Zarlino introduced two categories of instruments: “mobile” instruments with flexible pitch, such as a violin or a trombone, and “stable” instruments of fixed pitch, such as the piano or xylophone. He identifies a subcategory of stable instruments with some degree of mobility; I would place the lipping natural trumpeter or hornist here. See de Souza, *Music at Hand*, 62.

12 This explains the typical distribution of parts in the modern horn section, with horns I and III as high parts and horns II and IV on lower parts. In American symphony orchestras, players will hold a seat for one of these parts only; in European orchestras, players will often switch between the parts in their respective registers.
and p6—of those instruments to construct an otherwise dissonant A-flat diminished seventh chord that would not be available on any two of them.\textsuperscript{13}

Fortunately, orchestral hornists and trumpeters did not need to own entire instruments in every key: instrument builders in the seventeenth century devised a system where various lengths of tubing, called crooks and couplers, could be added to the mouthpipe of a trumpet or sackbut. The principle was adapted to the horn sometime in the early eighteenth, and thus a player could have at their disposal an instrument of a new length, and thus a new key, in the amount of time it took to remove and replace the bits of tubing in the instrument.

![Image of a horn with crooks and couplers](image)

Figure 0.2. D. Jahn, orchestral horn with crooks and coupler in various lengths, Paris, ca. 1819–26. Brass, 386mm. Boston, Museum of Fine Arts.

\textsuperscript{13} see de Souza, 157–9.
Instrument makers and horn players derived other methods of accessing additional pitches beyond those of the harmonic series, which we will examine in more detail in the chapters that follow. In the meantime, we now have available to us a natural horn pitched in E-flat, which is the instrument for which Beethoven composed the first movement of the *Eroica* symphony. It is to this work, and this horn, that we now turn.
CHAPTER ONE

THE HORN AS HERO in BEETHOVEN’S EROICA

Beethoven’s Symphony No. 3 in E-flat major (Op. 55, 1803) needs little by way of introduction, for the Eroica is, in Joseph Kerman’s words, “an authentic ‘watershed work,’ one that marks a turning-point in the history of modern music.”\(^1\) The first movement sonata-allegro was first heard as glaring, bizarre, too long, and in the ears of one critic “pushing limits” of length, scope, and chromaticism “that ought to be respected by the instrumental composer.”\(^2\) Through familiarization, however, the work would be understood—like the promise of Napoleon Bonaparte, the original inspiration for the symphony—as truly revolutionary: that same critic in the next breath described the work as “one of the most original, most sublime, and most profound products the entire genre of music has exhibited.”\(^3\)

Commentators on the symphony have drawn upon the full title—the Sinfonia eroica: *composta per festeggiare il sovenire di un grand Uomo*—as inspiration for their reading of the symphony, and the sonata-allegro first movement is almost invariably read as the journey of a protagonist who, on the field of battle, undergoes a test of will and emerges triumphant. In his monograph on the symphony, Thomas Sipe catalogs the various protagonists that have been forwarded as the eponymous hero, the titular grand Uomo, including a pre-coronation Bonaparte, a literary, epic figure such as Prometheus or the Illiad’s Hektor, an idealized, generic solider, or an abstract heroic mentality.\(^4\)

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3 Ibid.
In this chapter, I will consider the concept of the work that facilitates these readings—and which serves to make Beethoven and the analytical listener the transcendent heroes of musical being—and consider what happens if we choose to follow the fortunes of a different protagonist in the symphonic mêlée: the three horns.

**The Hero and the Composer’s Voice**

The primary theme of the movement is typically understood to present two aspects of the hero in succession. The bare, arching E-flat triad (mm. 3–6) of the theme presents steady heroism; the descent to C-sharp (mm. 6–7) undermines the tonic’s simple power through the intrusion of the complex chromatic. Since it is part of the singular musical line—here intoned by the cellos—readers have read this C-sharp as representing a seed of doubt within the hero’s own psyche, introducing conflict from almost the very beginning.

Example 1.1. Beethoven, Symphony No. 3, I. Allegro, mm. 3–8, cello

In his dramatistic reading of absolute music, Edward T. Cone would describe this musical line as a “temporary virtual agent,” a clearly individuated component of the “complete musical persona” presented by the full orchestra in the course of the work. Listeners and performers are to attend to and self-identify with—indeed, impersonate—the “complete musical persona” as a composite, unified utterance of a conscious, personal subject, what Cone identifies as “the composer’s voice.” Cone describes that “to compose is to control this inner voice, to shape it

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6 Ibid., esp. 81–114. Specifically, Cone describes that a virtual persona requires “joint continuity of line and timbre” to appreciate a temporary unitary agent within the terrain of larger form and its progression (Ibid., 112)
into new forms, to make it speak for us. To listen to music is to yield our inner voice to the composer’s domination. Or better: it is to make the composer’s voice our own.” In *Beethoven Hero*, Scott Burnham describes this identification—this yielding—as “presence” by means of which the listener engages in a parallel “self-structuring” alongside the hero through anthropomorphic metaphor to the music. As such, “human experience is here cast as heroic experience,” Burnham explains, and through attention to Beethoven’s voice, the listener can, perhaps, become the hero.

That we understand music to embody the composer’s voice—the expression of a liberated, aesthetically autonomous composer who possesses ultimate authority—is a result of what philosopher Lydia Goehr calls a “work-concept” that coalesced in the years around the composition and premiere of the *Eroica*. Musical “works,” artefactual and aesthetically complete, are a function of this concept. The work-concept emerged out of a need for music to qualify as a fine art, which in turn required that it become artefactual (rather than as functional in

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7 Ibid., 157.
9 Ibid., xiv.
10 Lydia Goehr, *Imaginary Museum of Musical Works: An Essay in the Philosophy of Music*, Revised (New York: Oxford University Press, 2007). Her paradigmatic example is Beethoven’s Fifth Symphony in C minor, op. 67; however, given the *Eroica*’s acknowledged status as a ‘watershed work’—and arguably for anticipating many of the same qualities as the Fifth—and its prominence in the canon, it nonetheless functions under, or contributed to the establishment of, the regulative work-concept at the time. Indeed, that a work of music should or could be revolutionary or challenging for the edification of the listener is a function of a regulative work-concept under the Beethoven paradigm, or the Romantic cult of personality more generally.

Since *The Imaginary Museum*’s first publication, several musicologists have published rebuttals regarding her dating of the work concept, generally seeking to place its origins earlier in musical history. For my purposes, the date of origin is irrelevant; rather, the crucial point is that the work concept was regulative by this point in history.

“extra-musical” contexts), and ultimately allowed for music to become, for a time, preeminent among the arts: “It is perhaps in music,” Goethe wrote, “that the dignity of art is most eminently apparent, for music has no material element that has to be taken into account. It consists entirely of form and content; and [therefore]… elevates and ennobles everything that it expresses.”\(^\text{11}\)

Through identification or presence, the musical work-concept allows for music, as a fine art and even beyond the abilities of the plastic arts, to transcend the worldly and particular toward the spiritual and universal (such as a generic heroism), and demands that its listeners engage in a quasi-religious mode of appreciation of Kantian disinterested attention or Cone’s imaginative participation.\(^\text{12}\)

The work-concept is *regulative* in that it determines how music should be approached. The activities of music become equated with those surrounding the work—its composition, its performance, its publication—and the musical work becomes a personally-owned unit, already complete in-and-of-itself outside of any particular embodiment (Goethe’s “no material element”). That is, the musical work is a permanent, repeatable object that is *separable* from any particular instantiation in performance—indeed, no longer requires performance at all—able to be placed in what Goehr refers to as “the imaginary museum of musical works.” A crucial site of this development was the full score, which was understood to contain—if not the totality of the work—its most complete and accurate embodiment: a physical document that both symbolized to the listener the complete musical persona and reminded the performer of the composer’s authority. Performance came to be valued for the accurate recreation and retrievability of the

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\(^{12}\) Cone, *Composer’s Voice*, 118: “What I have in mind is an active participation in the life of the music by following its progress, attentively and imaginatively, through the course of one’s own thoughts, and by adapting the tempo and direction of one’s own psychic energies to the tempo and direction of the music.”

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score (*Texttreue*); however, performers were also confronted with a moral obligation for its proper interpretation (*Werktreue*) to capture a transcendent remainder—the spirit or Divine Ideals, such as heroism—that cannot be directly coded in the mundane notation required for the composer to make his utterance repeatable and thus beyond of time and place, a “timeless masterpiece.”

The “work” was, of course, epitomized by Beethoven’s compositions and the modes of attention they garnered and provoked, or rather, the modes of attention that were cultivated for them. The institutions of serious music shaped themselves around the presentation and preservation of the work and its composer. As Tia DeNora has shown of contemporary Vienna and Scott Burnham of music criticism and analysis since, Beethoven was placed at the apex of music, his works built into the foundation of the canon and of our analytical methods, his image physically placed in its edifices at the center of the proscenium arches in concert halls.\(^\text{13}\) Perhaps not coincidentally, following the first private rehearsals of the difficult work in the early summer 1804, Beethoven sent the *Eroica* to Breitkopf & Härtel for publication, and made the request that the symphony be issued in both parts and full-score format.\(^\text{14}\) The request was unusual in that, to this point, symphonies were primarily published as sets of parts; the request for a full score presented an extra expense that may have contributed to Breitkopf & Härtel’s ultimate rejection of the work. The parts were published in October 1806, a year and a half after the public premiere, by a local Viennese firm.

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Scores—and derivative embodiments in performance—are how we typically experience the work under the work-concept. This synoptic (or panoptic) gaze allows for complete identification with, in Cone’s rendering, the complete musical persona and its composite agents and personas.\(^{15}\) As such, music for bourgeois listenership and specialist analysis created a demand for the publication of full scores in the nineteenth century; these visual technologies afforded abstract and idealized performances that took place entirely in the reader’s mind, an always perfect, complete performance that maintains an ideal of fidelity to the total work. During the course of the nineteenth century, the specialist conductor would emerge from the ranks of the orchestra to stand at the head of the ensemble, his back to the audience, symbolizing the composer’s authority and complete control over the complex events that unfold before him.\(^{16}\)

Thus, regardless of the protagonist forwarded, the hero is always—like the work, the composer, his surrogate the conductor, or its appreciator the listener—singular, authoritative, able to achieve ultimate transcendence.

Where Cone would say that the listener immediately identifies with the composer’s voice in the composition as the abstract persona of a conscious agent, Burnham and DeNora have demonstrated how—through sustained engagement with his oeuvre and biography—we come to make heroic Beethoven’s compositional process and make revolutionary the works that result. This attention has given rise to one of the most enduring stories of heroic overcoming in the history of music: that of Beethoven himself as the artist-hero. The symphony was composed while Beethoven was, on the advice of his doctor, on a sojourn to Heiligenstadt to ease his

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\(^{15}\) Cone, *Composer’s Voice*, 136; Cone here also notes that this practice was “lamentably not available before scores existed,” demonstrating the often-denied reliance of music’s transcendence upon visual and material technologies.  
\(^{16}\) Cone continually insists that conductor is the “surrogate of the composer’s persona” and authority, such as in *Composer’s Voice*, 88. See also Stevens, “Why Conductors?” Goehr notes that, “despite the theoretical alternatives, mainstream conductors have not been convinced that they should dispense with the ideal of fidelity to composers and their works,” *Imaginary Museum*, 275.
failing hearing. Solomon and other commentators consider that Beethoven’s psychical crises about his hearing and family strife, so famously described in the so-called Heiligenstadt Testament, may have been a necessary pre-condition to his creative flourishing: as a result of his emotional tumult and ensuing physical removal from the musical scene in Vienna, Beethoven began to compose in a *neuen Weg* or “new way.”

Beethoven’s hearing diminished yet further in the next fifteen years; the end result was that, as Richard Taruskin describes, “his creative activities now took place in an unimaginable transcendent space to which no one but he had access,” paving the way for a God-like status by removing him from the mundane world, musical or otherwise.

The tones and works he composed could only be imagined, “virtually,” in his innermost being and mind, rather than experienced as vibrational sound in “actual,” phenomenological performance; under the burgeoning work-concept and its related *Werktreue*, however, this was perhaps for the better.

Music, Schopenhauer assured the reader, “reproduces all the movements of our innermost being but [is] quite divorced from phenomenal life, and remote from its misery.” As the nineteenth century progressed, Beethoven became “the Olympian being, far removed from the ephemeral transactions of everyday musical life.” That is, Beethoven himself—along with his works—came to be transcendent, removed from the miseries of mundane existence, indeed, conquering them—with “a fuller consciousness of his own personal greatness, a wider view of a

17 Sipe, *Eroica*, 16.
18 Richard Taruskin, “The First Romantics,” in *The Oxford History of Music*, vol. 2: *Music in the Seventeenth and Eighteenth Centuries* (Oxford: Oxford University Press, 2009), online. Goehr (*Imaginary Museum*, 162) writes that the creator became God-like in his access to the spiritual, “not the individual or mundane thoughts of the mere mortal, but the universal thoughts of which there can be no personal ownership.”
vast realm of imaginative music lying open to him alone.”22 Through right listening and identification with the composer’s voice, the listener can become aligned with both the protagonist hero and, through Beethoven’s triumph, participate in the Schopenhaurian “universal will,” “sounding truth beyond simple sound.”23

For critics and commentators, it is perhaps easier to assume identification with the composer and compress agency to the virtual realm, for the sake of the coherence of the work and its (or his) authority. Indeed, the listener—whether ideating or in attendance at a performance—is granted the greatest potential for a complete view. Yet as Cone’s essay demonstrates, such transcendence for the listener—a silent co-utterer—is a product of presence to and active investment in the labor of multitudes—whether ideated or material—as sounding, sounded or envoiced agents.24 Under the regulative work-concept, however, the actual performers are to become self-negating and transparent, a mere medium for the composer’s voice, assuming a duty to allow the music “to speak for itself.”25 Carolyn Abbate writes:

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24 These agents or actors most obviously consist of the composer, the conductor, and the players of the orchestra; in a more expanded view, these agents would include the audience, concert producers, instrument makers, concert hall builders, music publishers, and so forth, creating an “art world” surrounding the production of music. The concept of art worlds was first posited by Howard S. Becker in 1982 (Art Worlds, 25th anniversary edition, updated and expanded [Berkeley: University of California Press, 2008]). The general concept was applied to serious music making in the west by Christopher Small (Musicking). Small’s contribution demonstrates the ritualized forms of encounter of music, and, inasmuch as these rituals are organized around the production of the musical work, rely on the institutional power of Goehr’s work-concept and Werktreue.

Cone explicitly argues against the most rigid of ritualistic approaches, the performance as “the reverent reading of a sacred writing” (Composer’s Voice, 116) in lieu of “vivid experience” (Ibid., 117) and “active participation in the life of the music” (Ibid., 118). Elsewhere, however, Cone speaks of the composer’s authority, the “duty” of the performers, and the (il)legitimacy of interpretation, which speaks to a moralistic, Werktreue-(if not particularly Texttreue) informed position of deference to the composer’s transcendent utterance: “If [scores] inhibit spontaneity, it is the personal spontaneity of the player, not the inherent spontaneity of the music, that suffers. And since the two often come into conflict, it is sometimes fortunate that the presence of the score can remind the performer where his primary loyalty should reside,” (Ibid., 65).
25 Cone, Composer’s Voice, 62: “The faithful performance… allows us to hear the persona, and hence the composer’s voice behind the persona, speak for itself. The illegitimate interpretation… forces us to hear the singer speaking through the persona and hence converting the composer’s voice into a medium for his own self-
Author politics in music [such as those dictated by the work-concept] are thus in great measure also performer politics, for when confronted with human sources of sonority in live performance we create for ourselves a polyphony, in which the noise-making of the human individuals before us—as a little drama of usurpation that powerfully disperses the “composer’s voice”—encourages us to assume the other singers, inside the music.26

That is, under Werktreue ideology, the presence of sounding material bodies—human musicians and their instruments—before us can, at best, enliven our identification with the composer’s voice or, at worst, distract from its transcendence.

The Horn as Agent in the Eroica

Regardless of the reading of the Eroica, one particularly salient agent—an instrumental voice—is the horn that anticipates the recapitulation.27 In the retransition from the long development, as the first and second violins sound a major second on A-flat and B-flat—the third inversion of the dominant seventh in its starkest form—over which a horn sounds the arching hero’s theme in the tonic, catapulting the form to the recapitulation. This odd moment of thematic-harmonic overlap is, in the hermeneutic mode, described as the hero’s stirring to expression.” Cone then notes, “I do not mean to imply that there is anything morally, or even esthetically, wrong about this practice. I merely insist that what one is listening to in such cases—as in many virtuoso performances of ‘serious’ music—is not the piece being performed, but the performance itself” (Ibid., 62–3). That is, this iteration does not meet the requirements for Werktreue under the regulative work concept. See also Goehr, “The Perfect Performance of Music and the Perfect Musical Performance,” New Formations 27, “Performance Matters” (1995): 1–22; Richard Taruskin, “On Letting the Music Speak for Itself,” Journal of Musicology 1, no. 3 (1982): 338–49, reprinted in Text and Act: Essays on Music and Performance, 51–66. New York: Oxford University Press, 1995.


27 Cone, Composer’s Voice, 86–7 writes: “A musical composition, then, according to Berlioz, records and communicates an inner personal experience, and this is as true of a symphony as of a solo. Yet at the same time, within the complex orchestral texture…the instruments often appear to be leading lives of their own—to be speaking, acting, reacting, in quasi-human fashion…. [It is] not just that instruments have personality, but that instruments are personalities.

“One must be careful here. It is not the material instrument that is personified, but the energy it transforms—kinetic into sonic—and transmits. Thus our discussion properly refers to the sound or voice of an instrument rather than to the instrument itself.”
consciousness, self-awareness, assuming his heroism through a distant summons from the battlefield, drawing upon the historical imagery of the horn as signal instrument.\(^\text{28}\) A more formalist view reads the “horn going berserk,” in Richard Taruskin’s words, the instrument reacting to the interminable formal-harmonic tension and taking more than a modicum of agency in the progression of the form.\(^\text{29}\) Of course, the horn is here sounding as a dutiful agent in this hard-won *coup de théâtre*, and Cone, for his part, would remind the performer where his duties lie: to the faithful expression of the persona’s experience and not his own.\(^\text{30}\) In the oft-recounted story, during the first rehearsal of the symphony on June 9, 1804 at Prince Lichnowsky’s palace, Beethoven’s student Ferdinand Ries misunderstood this moment and admonished the horn here for entering too soon; that is, the horn player was faulted for (unintentionally) inserting himself—a musician-*cum*-instrument—where the music itself did not (seem to) call for that utterance. This bizarre outburst experienced in live performance would, through repetition and familiarization, become understood as a “stroke of genius” on Beethoven’s part, and the hornist’s agency carefully folded back into the composer’s voice in the work.

Cone suggests that investment in the fortunes of the unitary musical protagonist—the complete musical persona, the composer’s voice—is essential to comprehension of the work; this

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\(^{28}\) Cone, *Composer’s Voice*, 94: “In every case there is a [singular] musical persona that is the experiencing subject of the entire composition, in whose thought the play, narrative, or reverie, takes place—whose inner life the music communicates by means of symbolic gesture.”


Cone, *Composer’s Voice*, 106–7: “The music should give the effect of composing itself through the instrument, by means of the player. For once the relationship of performer, instrument, and agent has been clearly established, it is unnecessary—indeed, hardly possible—to make a hard and fast distinction between performer and instrument. Whether one thinks of the performer as the motive power of his instrument, or of the instrument as an extension of the performer, for musical purposes they are almost as indissoluble as a singer and his voice. This is, in fact, the way we tend to think of a good performance: as the achievement, not of a musician or of an instrument, but of a compound creation, the musician-*cum*-instrument,” which is an instrumental persona, symbolized by the musician-*cum*-instrument but realized in the voice of that instrument.
is the “presence” to, “immediate experience” of, and ultimate “identification” with the hero—whomever he may be, and in whatever instrumental guise—that invites the listener to transcend their contemporary situation in pursuit of timeless and ineffable truths. This approach to the total artwork is aligned with what Abbate has called the “gnostic”: the panoptic, reverential gaze of the listener or analyst in detached contemplation, bound up in the “cryptographic sublime” of the full score.31

Yet, this striking moment of thematic return is, in every reading, always identified with the horn’s agency; in Cone’s sense, the “temporary virtual persona” is a specifically hornistic persona who seizes the attention of both hero and listener. What might we come to understand, instead, if we participate in the fortunes of that horn? What if, instead of under the center of the proscenium arch, we stand beside the hornist, off to stage right or across the battlefield? What I propose is that we engage in a perspectival, imaginative variation—but actually quite pragmatic—in our attention to the Eroica, a “drastic” experiment: to assume identification with a single instrumental agent, even if it denies us ultimate authority and omniscience about the work—or its “complete musical consciousness”—itself.32

31 Carolyn Abbate, “Music—Dramatic or Gnostic?,” *Critical Inquiry* 30, no. 3 (2004): 505–536. Goehr writes similarly of philosophy’s gnostic: “Usually when philosophers of music ask after the ontological status of musical works, they do so from the position of audience and thus as interpreters who enter the game when the processes of composition and performance are for all intents and purposes complete. Otherwise put, musical works are typically treated by philosophers as they are treated by critics and historians—as objects with Being. They are treated as ready-made or as belonging to the past, rather than as existing in the process of their being crafted or constructed (which is a perspective often taken by performers or music theorists). As such, they are treated by philosophers as objects for exhibition, description, and interpretation. Coming after the fact, philosophers often assume the attitude fitting a well-established positivistic philosophy of—a philosophy in which the world is looked upon or even down upon as given. Here, there is a disenfranchising tendency exhibited when works are treated not as alive and particular, but as dead or thinned out in the act of their being made to fit an already established ontological category.” (Goehr, *Imaginary Museum*, xxxvii–xxxviii)

32 In Cone’s formulation, the best examples of protagonists are vocal characters or the soloists in concertos, and are rare in the symphonic repertoire otherwise. He gives the example of the solo viola in *Harold in Italy*, adding “it is equally obvious that one does not have to consider the entire *Fantastic Symphony*, or even the third movement, from the point of view of the English horn” (Composer’s Voice, 124).
In other words, what if we make the horn the hero?33

“We have a choice,” Goehr writes, “either to listen to the work according to what we already believe it will show us, or to listen to it for something it might persuade us to rethink.”34 Rather than the personification of the composer’s voice and the gaze of authority located in the conductor-surrogate’s gaze upon the full score, we focus on a few staves in the spatial center of the score that come and go as the horns do.35 To facilitate this reading and listening against the grain, I will consider the horn parts.36 A part is not co-extensive with the score, and therefore cannot guarantee compliance with the totality of the work or assume the total authority. “Except for conductors and pure soloists, then, it would seem that performers are barred from a full appreciation of the music they are playing!” Cone anticipated. “Now, we might all agree that the listener is in a better position to grasp the full import of a symphony than, say, the second oboist; but does the listener really understand a violin concerto better than the soloist?”37 If we eschew omniscience, a part becomes a tool—and the horn a medium—that grants what Donna Haraway has called a “partial perspective,” a self-consciously situated location that can look askance at received knowledges by shifting the tools and instruments at work—here, literally at and with the horn.38 We substitute the score of a work for the part’s working instructions, for a part is not meant to be contemplated, but to be played.

33 Cone, Composer’s Voice, 122: “The goal of participation must be identification with the complete musical persona by making its utterance one’s own.” However, “even though one may identify oneself ultimately with the entire persona, that identification necessarily depends on imaginative participation in the musical life of each of its chief components.”
34 Goehr, Imaginary Museum, lii.
35 As in Cone, Composer’s Voice, 88: “The conductor is the surrogate of the composer’s persona: That is, by directing the performance, he symbolizes both the composer’s actual authority over the musical events and the persona’s imaginary control.”
36 Recall that before the nineteenth-century (and the dominance of the regulative work-concept), orchestral works were issued primarily in parts, and only rarely in full score.
37 Cone, Composer’s Voice, 132.
At a fundamental level I propose a part-based approach to the *Eroica* because my knowledge of and experience with the symphony is and remains primarily situated at and with the horn, as *work* rather than *a work.* Rather than attempt to move into omniscience, I claim and even double down on my position, on my situated knowledge at the horn. I aim to take the work and the horn out of the museum, to play it in bits and pieces as I might practice it and rehearse it, rather than consider it from the full score as a disembodied “mind-mind game” between the composer and listener that performance can only seek to capture, or as a “cryptographic sublime” for gnostic contemplation. By claiming such thickness for the horn part, I seek to re-enliven or deepen experience with the work that appears so familiar in toto. In this attempt, I will find myself inevitably shoring up some of Beethoven’s authority—for the work and my approach to it have, after all, been shaped by the regulative work-concept, and the *Eroica* is already aesthetically complete before the conductor raises his baton, or even steps on the stage. Yet the horn section’s position off to stage right may, I contend, provide for exactly the kind of variation that can shift the focus from our “metaphysical mania” and reveal some of the edges of our regulative concepts.

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While eschewing complete relativism, Cone states: “The content of instrumental music is revealed to each listener by the relation between the music and the personal context he brings to it. Since each such context can be only exemplary, the resulting content can only be partial. The total content of a complex and profound composition is thus probably beyond the comprehension of any individual listener; it is a potential content matching the entire expressive potential” (*Composer’s Voice*, 171).

39 This echoes Adorno’s critiques of the commodity culture of music—that we lose sight of construction and work (form and labor), in Goehr, *Imaginary Museum*, xi.


42 Abbate, “Drastic or Gnostic?” 505.

In the days before he transcended this material plane, so to speak, Italo Calvino wrote a note concerning the structure of a collection of short stories—including “A King Listens,” taken up later in this chapter—into a book about the five senses. “Both in art and literature,” we might also add here academic knowledge production, “the function of the frame is fundamental. It is the frame that marks the boundary between the picture and what is outside. It allows the picture to exist, isolating it from the rest; but at the same time, it recalls—and somehow stands
In Cone’s reading, the instrumentalist is never to be thought of as the composer, or even composing; indeed, even her identity as a “real” character or persona is sacrificed in favor of an “implicit” “virtual” agency made concrete through her instrument. Under the work concept, we typically do not think of the performer as a free individual, yet she—and her instrument—do have a history before the work: While the hero comes into being at the moment of composition or our attention to it in performance, the horn has always already existed. What, then, are the preexisting conditions for the composer and the instruments and players working under the conductor’s baton, charged with translating his silent kinetic gestures and the composer’s graphic inscriptions into real actionable sound?

There is, of course, more than one horn at work in the symphony: there are three horn parts, each enacted by one musician-cum-horn. (That there are three horns—a truly odd number, in all senses of the word—will be explored below.) Inspired by Goethe’s declaration, that the genre of the string quartet presents a “conversation between four intelligent individuals,” Edward Klorman developed an analytical model of multiple agency to nuance Cone’s Romantically-influenced reading of singular agency. Klorman’s part- and player-driven analyses of Mozart’s
chamber music read as a sort of theatrical script for the musicians-\textit{cum}-instruments to engage in present-tense interactions as a kind of spontaneous conversation in and about—or thinking through—musical gesture. The symphonic orchestra however, has historically presented more outward-facing organization than the intimate games of the musical drawing room. This is in part due to size: the agents of a trio or quartet are more easily self-organized than the polyphonic masses of the orchestral polity. Under the work-concept, however, all these actors have compressed into the singularity of the authorial composer’s voice. As Emily I. Dolan has shown, as the individual timbres of the instruments—their voices—and their interactions became normalized, their individual and collective voices were largely effaced, their efficacious, sonorous materiality reduced to a secondary parameter of the work’s integrity as disembodied form and motif.\footnote{See Emily I. Dolan, \textit{The Orchestral Revolution: Haydn and the Technologies of Timbre} (Cambridge: Cambridge University Press, 2013).}

One must also consider instrumentation, the distribution of musical material or the assignment of musical agency within the ensemble. Orchestration is part-and-parcel of work production, and must take into account the possibilities and limits the instrument that comprise the ensemble. Due to the horn’s historical limitations, the musician-\textit{cum}-horn, hornistic persona—or, more simply, the \textit{hornist}—remains acutely aware of the heterogeneity of instruments—their “concrete vehicles”—that limit, in some ways, whatever degree or guise of agency a musician-\textit{cum}-instrument can be said to claim.\footnote{“Concrete vehicle” is from Cone, \textit{Composer’s Voice}, 105.}

From the concrete instrumental perspective, we might consider the orchestra as a kind of \textit{organism}—a whole with interdependent parts. The term has derivation from both the post-classical Latin \textit{organismus}, meaning a polyphony of voices, and the French \textit{organisme}, an
individual animal, plant, or single-celled life forms—thus staking territory in both the heterogenous and unified aspects of what a grouping can be.\textsuperscript{48} Organism reminds us of organs—not the musical keyboard instrument, but those differentiated structures that perform specific functions in political, social, or biological—organized—bodies.\textsuperscript{49} (The shared Latin root organum also refers to instruments, and is the source of the term organology.)

Distribution of musical material—and thus virtual agency—within the orchestral organism and even within the horn section is, as we will see, built on precedents not (only) of compositional design, but upon the affordances of their “concrete vehicles” and upon real historical modes of training for hornists that delimit how the ensemble is or can be built. We shift from a transcendent mode to an immanent one: redirecting our gaze from the mind-mind connection between composer and listener under the work-concept to a situated perspective that considers how the performer or musician-cum-instrument brings its own histories as hornistic personas—or, actual persons with horns—which the composer must accommodate in order to create at all.\textsuperscript{50} Where orchestration refers to the building up and control of the orchestral

\textsuperscript{48} Dolan identifies that in the eighteenth century, the orchestra was a kind of collective but diverse musical community (Orchestral Revolution, 3). As the orchestra and orchestration normalized and standardized under the work-concept, it came to be seen as a unified musical and institutional body (Ibid., 4). She uses the term polity to point to the institutional politicization of this body (Ibid., 135).

\textsuperscript{49} Organon can refer to a bodily organ, especially one that is an instrument of the soul or mind, or also an instrument of thought or a system of rules for discovery.

\textsuperscript{50} As Szendy (Phantom Limbs, 107) writes: “Musical bodies, which we believe to be aerial and hollow and resonant like dreams, leave lasting traces… they are embodied in archives, prostheses, maculatures, instruments, organa.”
ensemble or polity, attention to instrumentation—the organization of material within it—reflects necessary deference to a distribution of musical labor according to the skills and needs found within a heterogeneous community of different abilities, functions, and commitments.

Attention to the horn parts of the *Eroica*, then, promises neither complete identification with Beethoven nor the listener, nor with the Hero and his narrative, nor does it promise to overturn these concerns. Rather, three-fold presence and noisy materiality present drastic remainders—“performed music’s action”—that are generally suppressed under the gnostic demands of *Werktreue.* Even the relatively small number of musicians here cannot—for reasons that will become clear—be compressed into an single instrumental monolith; therefore, I consider each part in turn. The first movement’s “heroic” key of E-flat major was, and would continue to be, long associated with the instrument as an ideal key: These implications and the positive effects of instrumental limitations in the harmonically-wide ranging movement become salient in the first horn part. Despite its prominence in critics’ narratives, the aforementioned horn solo—the cumulation of the movement—is actually given to the *second* horn for reasons concerning the historical division of labor within the horn section. Additionally, this call and the near unanimity of its interpretation provides an opportunity to consider the musicopoetics of the

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51 Abbate, “Drastic or Gnostic?” 530.
52 John David Wilson, “Of Hunting, Horns, and Heroes: A Brief History of E-Flat Major before the Eroica,” *Journal of Musicological Research* 32 (2013): 163–4. For example, E-flat is the key of three of the four concertos by Mozart and both those of Strauss, and in most chamber music for the natural [valveless] instrument, including Beethoven’s Opp. 16, 20, and 81b. It may be of note that E-flat is a particularly good key for orchestral horn—for its register and hand technique—and so this instrument is often deployed in E-flat; additionally, Wilson (Ibid., 171) argues this may have worked back onto the hunting instrument—previously pitched in D or F. Thus through tenuous association, E-flat became associated with German hunting horns, which lends back to the key a heroic valence through timbral association with the instrument above any quality inherent to “the key itself,” such as we might consider is the case with C major and its association with trumpets and timpani.

Additionally, E-flat major was also Beethoven’s most frequently selected key for instrumental compositions. For more on the symbolic associations and compositional history of E-flat major specifically, see Wilson, “Of Hunting, Horns, and Heroes.” For more on key symbolism in Beethoven’s oeuvre through reference to vocal music, see Paul M. Ellison, *The Key to Beethoven: Connecting Tonality and Meaning in His Music* (Hillsdale, NY: Pendragon Press, 2014). For more on key characteristics in general, see Rita Steblin, *A History of Key Characteristics in the 18th and Early 19th Centuries*, 2nd ed. (Rochester, NY: University of Rochester Press, 2002).
One of the unusual features of this already “unusual” symphony is the addition of a third horn; orchestral horns typically come in matched pairs. This odd instrument can be understood as an additional “heterogenous element” that merits further discussion of the sociality or function of the instrument within the orchestral organism.

First Horn: Tonality and Timbre

Part 1: Exposition

Recall from the introduction that western orchestral brasswind, as a *corps sonore*, operate primarily upon the tones of the harmonic series. We used the example of an archetypical instrument pitched at ‘8-foot’ C, a length of trumpet typically associated with Haydn’s military symphonies but only rarely used as a length for the horn, whether in functional or musical settings. Rather, the horn is typically longer and thus lower: the long, coiled hunting horns popular at Versailles when they were first brought into heterosocial music-making were some 14 feet (442cm) in length and thus with a nominal pitch in D. These are the instruments for which Lully and Bach composed, and also the key and length of horn for Haydn’s famous “Horn Signal” symphony (Hob. I:31) and the two concertos that are attributed to him. While the horn would eventually settle into ’12-foot’ F (369cm; the key of Bach’s Brandenburg Concerto No. 1 [BWV 1046] and the nominal pitch of modern horns since the mid-nineteenth century), the Austro-Germans first favored a horn pitched in E-flat, about 416cm in length. This is the length of horn for which Mozart wrote three concertos and all his chamber music with the instrument, with Beethoven following suit in his Op. 20 Septet and the Op. 81a Sextet for Two Horns and

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54 The attribution of the “second concerto” (Hob VIIId:4) is uncertain; it may have been composed by his brother, Michael Haydn.
String Quartet; this is also the principal key of the horns in the first movement of the *Eroica* symphony.\(^5^5\) Examples 1.2 and 1.3 show the sounding harmonic series afforded by horns pitched in E-flat and F.

Before we proceed further, let us take a moment to observe notational practice for the horns as would be read in the parts. Note that the trumpet and horn parts (and their notation in the full score, as well) make reference not to the harmonic series in E-flat, but rather in C, as in would be upon our archetypical C instrument. That is, the parts appear to be in C major, but the sounding result is in E-flat; in the case of the horns, the sounding pitch is a major sixth lower than written.\(^5^6\) This method of notation allows the musician-*cum*-horn to read not for specific pitches but for *partials* located more generally upon the topography of the instrument.

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\(^{55}\) The trumpets are also pitched in E-flat for the first movement of the symphony, though at half the length of the horns. The symphony also calls for horns in C in the second movement, though these would be in C *basso*—that is, ‘16 foot’ C, twice the length of our model 8-foot instruments.

\(^{56}\) For comparison, on E-flat natural trumpets, which are half the length of E-flat horns, the sounding result is a minor third higher.
To take the theme out of context (ex. 1.4), the horn plays p4, p5, p4, and p3, moving stepwise along the instrument’s topography, but, due to the irregular pitch space of the harmonic series, what sounds are intervals of major thirds and perfect fourths. Note also that when E-flat trumpets play the same partials, the result is an octave higher than the E-flat horn. This same sounding result can be replicated one octave higher, but due to the diminishing intervals of the harmonic series, the horn will omit p7 and p9 to sound the theme on p8, p10, p8, and p6 (ex. 1.5).

The advantage is that, regardless of the actual length of instrument, the notation refers to places on the *corps sonore* which is mapped to appropriate sounding pitch, or what Jonathan de Souza refers to as *place-to-pitch mapping*.”57 What appears as one pitch may sound another

because, from a part-based perspective, notation does not merely describe music but also suggests locations upon the instrument, and sometimes prescribes actions on the part of the musician-at-the-instrument. What may appear to be notation is, instead, a kind of tablature.⁵⁸

For the horns, the triadic portion of the hero’s theme is heard in both available octaves in the exposition: it is heard in brief from the first horn with the wind presentation (mm. 13-18, in the fourth octave) and in the orchestral tutti statement (mm. 37–45, in the fourth octave for the first horn, in the third octave for the second).⁵⁹ However, recall that the triadic gives way to the chromatic: the enigmatic and much discussed C-sharp (A-sharp in horn notation) that, standing outside diatonicism, signals the protagonist’s doubt or obstacle. Since the pitch also stands outside the harmonic series, the natural trumpets and horns do not afford this pitch without intervention. They cannot “know” or “make” this doubt, this primary catalyst of music-narrative conflict and drama.⁶⁰

For this reason, when situated in the Classical orchestra horns mostly participate as harmonic instruments, as they do here in the Eroica; that is, they function less often as leading agents and more often as subordinate to others’ melodic drives, their sound mixed into the melee

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⁵⁸ Tablature, Szendy describes, is a kind of “mechanical practical knowledge that remains prisoner to the particularities” of the instrument. As a “dialect” of and located upon the instrumental body, instrumental music read through tablature remains hopelessly bound to its materiality, and denies the musician qua reader the logos of transcendent music, of song (Phantom Limbs, 33–37). We will return to the idea of tablature in the next chapter.

⁵⁹ Similarly, the trumpets (also in E-flat but at half the length of the E-flat horn) sound the melody in their third octave in mm. 37–40, along with the horns and the rest of the orchestra. Because of their place-to-pitch mapping, the third octave on the trumpet sounds the same as the fourth octave on the horn. The players’ lips, however, are always vibrating at the sounding frequencies; for example, p₄ for the E-flat trumpet requires double the vibration speed for the same p₄ for the E-flat hornist.

⁶⁰ Granted, A-sharp can be enharmonically respelled to B-flat (sounding D-flat), which can be accessed in the harmonic series. However, this seventh partial is quite low compared to equal temperament and would require a severe opening of the hornist’s hand to execute in tune; the result on timbre would be, I believe, less than desirable, and the intonation still likely a bit flat for a pitch that is, more likely than not, played sharp in the orchestra.

Moreover, this respelling of the C-sharp to the “enharmonic” D-flat occurs in the recapitulatory presentation of the Klang in the cellos. Despite their co-location on the piano, orthographically, analytically, and especially for musicians that operate beyond or outside twelve-tone equal temperament, these pitches are non-equivalent.
of composite, implicit accompanimental agents. By virtue of its intimate relationship to the harmonic series, the natural horn well affords the crucial tones of stable diatonic tonality but less so the seeds of its upheaval; as such, the horns’ participation becomes yet more limited as harmonic progressions venture further afield, even in moments of local stability. Thus, when Beethoven’s sonata-allegro forms feature wide-ranging harmonic palettes, such as the development of the *Eroica*, the horn may be less present and so a less advantageous perspective from which to analyze: in formalist narratives that dramatize the harmonic element above all, the horn will be lacking.

In the orchestral sonata-allegro movement, horn parts are typically replete with harmonic supporting material and rests, entering and exiting as the harmonic palette allows: this is the majority of the hornist’s labor in orchestra settings. For example, in the first half of the transition section (mm. 45–63), the first horn’s participation is limited to two pitches—partials 6 and 9, the fifth and second scale degrees of E-flat (B-flat and D)—as the overall harmony moves toward the dominant; when the harmony moves much further, they rest, as they lack completely fluent access to carry the twists and turns of modulation here. After reaching the second theme space (m. 83), the horns will bide their time—both unable to contribute as readily, but also saving their color in anticipation of the orchestral tutti (m. 109).

But recall, too, that the exposition is repeated: where the analyst’s labor is complete after one reading, the performer (and listener) go back and execute again. Thus the playing and

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61 Louis F. Dauprat, *Méthode de Cor-Alto et de Cor-Basse*, Part II (Paris: Schonenberger House, 1824), 121: “The greatest difficulty for the horns who begin to accompany in the orchestra is to follow the modulations, all the while counting a number of rests more or less long, [and] after which, they must bring in the notes with which they re-enter in the right key, and in the chord of which they are a part.” Trans. Jeffrey Snedeker, “[L.F. Dauprat’s] *Méthode de Cor Alte et de Cor Basse*,” Part V, *Historic Brass Society Journal* 8 (1996): 75.

62 According to his brother Carl, Beethoven considered omitting the customary repeat of the sonata-allegro movement, fearing it would be too long. After several rehearsals and performances, he relented: Carl writes that “it seems that it would be detrimental if the first part were not repeated.” Cited in Sipe, *Eroica*, 27.
counting efforts of the exposition are doubled, and the first horn plays the hero’s theme four times—not merely the two passes made with the copyist’s pen. In total, then, the lengthy movement may appear to the eye (and analyst) as 695 measures, but requires yet more: 846 measures of exertion—of presence—in live performance.

First Horn, Part 2: Development

A cursory glance over the first horn part for the exposition shows several pitches that require slight adjustment from their location in the harmonic series: the Fs (sounding A-flat) in the primary theme area and transition are almost available as p11 (see ex. 1.2 above and ex. 1.6 below), but would sound quite sharp compared to equal temperament. Luckily, horn players had by this time codified a method for securely accessing tones outside the harmonic series: “hand horn” technique. The top of the horn’s corpus is held in the player’s hand to stabilize the instrument against the vibrating lips; historically, the other hand was occupied with holding the reins of a horse whilst on the hunt. Once the functional instrument was domesticated into the orchestra and new musical demands placed upon it, horn players discovered that they could grant the rein hand a new occupation: by placing the hand into the bell of the instrument and manipulating it, they could adjust the length of the horn’s tube at the bell end through a technique referred to as “stopping.” (We will examine this technique and its acoustics in chapter two.) Thus, if the musician at the instrument closes their hand over the bell opening, they can lengthen the instrument enough to adequately flatten p11 to the diatonic scale. This same technique can be used to a lesser extent for slight adjustments in intonation for melodic or harmonic purposes, or when applied to a greater degree, can be used to access the written E-flat
(flattened mediant, sounding G-flat, m. 147), lowering p10 by an entire semi-tone, at the end of
the closing section.

With practice, hand horn technique affords the horn player (and the composer) a more
regular pitch space than the horn *qua corps sonore* provides. That is, the musician-*cum*-horn
becomes more chromatic in terms of pitch affordances in the third and fourth octaves by
instantly filling in the smaller gaps between the already decreasing intervals of the harmonic
series by use of *factitious*—that is, “made by hand”—pitches. This is how, in the development,
the first horn takes relatively equal footing with other temporary agents, playing a passage which
ventures markedly from the harmonic series of his “concrete vehicle,” the E-flat horn (ex. 1.6,
below): a statement of the scalar fugato subject in C minor.

[Example notation]

63 The other valence of *factitious*—the negative connotation which makes the term a synonym for artificiality and
falsehood—will be taken up again in Chapter Two.
64 Typical hand horn tutors do not label the partials—for they are inherent in the instrument’s mapping—and use
will fractions to describe the amount of covering needed for a given pitch. While clear in a chart format (first
introduced in 1824 by Dauprat, *Méthode de Cor Alto et de Cor Basse*, n.p.), application of the fractions and partial
numbers together created made for more clutter here than necessary.

The benefit of my adaptation is also to give the non-natural hornist, at a quick glance, a sense of the timbral
implications of the technique which will be covered in more detail in the next chapter. The heavier or more filled
in the marking, the more modified the timbre. (1) An unaltered partial is simply numbered with the partial. (2) Any
additional markings indicate a movement of the hand from the neutral position, where the more filled in the
marking, the more covered the throat of the instrument: namely, (2a) ø indicates a “half-stopped” note, generally
used to lower a partial less than a semitone; (2b) • indicates a covered or “three-quarter stopped” note, roughly
corresponding to a partial that requires lowering by about a semitone; (2c) o indicates a wide open note, for which
the player opens the hand from its neutral position, thus raising the pitch of the instrument. Further markings will be
introduced as they appear in the repertoire.

The description of closure levels for each pitch is derived from Heinrich Domnich’s tutor (*Méthode de Premiere Cor
et de Seconde Cor* (Paris: Le Roy, Conservatoire Imperiale de Musique, 1808), for general contemporaneity with the
As before, I have labeled the pitches of the harmonic series with their respective partial; the additional markings are symbols I have devised that indicate the amount of stopping, if used, for a given pitch. Recall that the notated pitch is itself a kind of tablature, as these positions are more prescriptive than the pianist’s or violinist’s fingerings: to execute this melody at this pitch level, the hand hornist must use this combination of hand positions and partials. Importantly, the effect of moving the hand inside the bell to open and close (“stop” or “cover”) the throat of the instrument carries timbral effects: those notes which are most manipulated by the hand—corresponding to a given pitch’s distance from the harmonic series—will sound darker and, depending on dynamic, air pressure, and force of attack, either softly muted and veiled or quite buzzy and distinct. We will examine this technique more closely in the next chapter; for the moment, suffice it to say that any pitch falling outside the harmonic series that occurs in the horn parts is possible, but will be effected timbrally. In the case of my annotation, these translate to any partial accompanied with an additional marking.

Moving from written C (p8), executed with the hand open and neutral, the horn plays a partially covered A (not available in the harmonic series in this octave, but rather is made by lowering p7 with the hand), a wide-open B-flat (to correct for p7’s inherent flatness), and several

_Eroica_ and due to the fact that the Conservatoire pedagogue studied with the noted Austro-Bohemian hornist Giovanni Punto, discussed below, before emigrating to Paris.

Note also that tutors in the early part of the nineteenth century did not include tables of hand-stopping positions, as we might see today with a standard fingering chart. Horace Fitzpatrick identifies two reasons: (1) the technique was considered something of a trade secret among hornists, but also (2) more importantly, “No two instruments are alike; and there are as many hand sizes and shapes as there are horn players…. Generally speaking, therefore, no-one is in a position to dogmatize on this technique; and the only certain way to learn to stop accurately is to experiment patiently along basic principles” (Horace Fitzpatrick, *The Horn and Horn-Playing and the Austro-Bohemian Tradition from 1680–1830* [London: Oxford University Press, 1970], 182). Additionally, different horn corpuses, crooks, and bells may also somewhat effect the exact amount of closure.
neutrally open tones before landing on an emphatically closed, buzzy, even “straining” sforzando on the written F (required to lower p11, naturally +49 sharp to ET, to the scale).

A knowledgeable composer can use the timbral implications to good effect: indeed, the tendency for a stinging quality on the hornist’s F (p11•) is reinforced by the sforzando indication in the part, but we may also consider that the marking is less prescriptive than descriptive of the horn’s affordances here. A hornistic persona of Beethoven’s time thus vividly colors his voice when it ventures beyond the harmonic series, which are also those pitches that are located away from the movement’s tonic, which is in turn concretized in the instrument’s length. Claiming a modicum of agency, we can note that the sforzando quality inherent in the horn’s—the actual horn’s—endeavor and utterance is made desirable for all the instrumentalists through consistent marking of this sforzando in all the statements, no matter the instrument-cum-agent to which it is assigned. On the other hand, we can acknowledge Beethoven’s conscientiousness in assigning this particular statement of the fugato to the horn, where it is most idiomatic.

The tutti that follows after a few entrances of the fugato subject would be similarly colorful due to its insistence upon similar stopped sounds on written F and E-flat in the first horn (mm. 252–269). When the horn returns to more open sounds (unaffected p10, p9, and p8; mm. 270–283), it then seems to “resolve” both harmonically and timbrally. Yet, this resolution to the tonic will turn to the minor mode (ex. 1.7).
The open sound on the first and fifth scale degrees confirms its proximity to the movement’s tonic, but with the natural instrument, this modal variation remains timbrally marked, signaling its not-quite tonicism. The tension is maintained, the endeavor prolonged since the hero has not yet overcome his obstacle.

These shadings inherent in hand horn execution were, as we will examine in the next chapter, long considered an asset rather than a deficit even after other options became available.65 During the first half of the nineteenth century in particular, individual temperamental and timbral idiosyncrasies of instruments were reduced or erased through specific technological developments and interventions. This, I contend, is part of a larger process of the normalization and erasure of timbre as a musical parameter through the control of the massed orchestral organism, such as explored in Dolan’s *Orchestral Revolution*, with the aim of bypassing mere phenomena for the sake of metaphysics and transcendence.66 Similarly, as the *Eroica*’s fugato passes between the various agents with their own voices, the timbral specificity of the actual horn’s utterance—its idiomatic quality of its voice—becomes wiped away in favor of the complex workings of the singular musical consciousness—the composer’s voice—if that is the abstract entity to which we attend. As Dolan writes: “The orchestra turned instruments into free subjects. But perhaps that which was granted the most freedom was the musical tone itself.”67

We will return to these implications for instrumental technology and musical reproduction in the nineteenth century in the next chapter.

65 This is evidenced most saliently in Brahms’ continued writing for the instrument long after the valve had become standardized—discussed in Chapter Two—and in that the Paris Conservatoire maintained the *cor simple* as its principal instrument of study until after 1900.
66 In her focus on orchestration as a totality, Dolan does not focus on the technological interventions on or within individual instruments of the orchestra, but rather does interesting recovery of automaton curiosities and other machines meant to mimic the total orchestral polity.
First Horn, Part 3: Recapitulation

From a gnostic perspective, a recapitulation is typically understood as the straightforward repetition of previously heard material compressed, more or less, to a single key. Since it is harmonically uninteresting (or at least predictable), it is ignored as an “embarrassment” to formalist narratives that privilege unceasing development, troubling to the teleology of hermeneutic readings, and generally glossed in analysis.68 As Dolan also demonstrates, orchestrational variation in these “repetitions” are often lost when the work is reduced to melody and harmony, or reproduced at the piano.69

Conversely, Dolan argues that the total and powerful effect of the sensuous and forceful orchestral body—especially in the symphonies and oratorios of Beethoven’s one-time teacher, Haydn—was crucial to making form sensible during the late eighteenth and early nineteenth centuries: form, harmony, and orchestration (or timbre more broadly) were co-articulated.70 The hand horn, I argue, is a privileged site for such co-articulation. As can be observed in examples 1.10 and 1.11 (in the next section), the majority of the pitches sounded by the horns in the course of the symphony are those of harmonic series proper to that length of instrument, and the Eroica

68 Burnham, Beethoven Hero, 18. Wilhelm von Lenz suggests that the recapitulation is the hero’s recounting of the story; Sipe glosses it as the formal demands of the sonata-allegro taking precedence over any narrative or poetic plan (both in Sipe, Eroica, 103). Other commentators, writing both before and after Burnham, almost bypass the recapitulation completely, as in Taruskin, “The First Romantics,” demonstrating the analyst’s remove from real-time musicking.

69 Dolan, The Orchestral Revolution, 16. She later describes: “It is precisely this process of re-imagining that allows us to speak of a musical theme in the abstract: orchestrational development helped foster the notion that a theme existed in some sort of ideal state, separate from its many manifestations within a given work. In other words, a theme’s ideality is created by the abundant material—the diverse technological means—unified by the orchestral assemblage of the symphony. In Haydn’s works, the orchestra transformed from an ensemble into a musical society, and that musical community fostered new forms of musical meaning” (Ibid., 134).

70 Ibid., 100: “The notion that some moment constitutes an arrival at a goal or wrong turn does not simply reflect an abstract fulfillment of or a departure from a ‘formal contract,’ but also the ways in which Haydn has manipulated orchestral sound to make that moment sound and feel significant…. Yet the notion that Haydn articulated form through orchestration does not sufficiently describe his compositional technique: to do so implies that form is somehow the ‘aesthetic goal’ of the work, as if sound were merely a convenient medium by which to convey the abstract beauty of these forms. To say that orchestration articulates form would be akin to arguing that the purpose of a new version of a theme is to create variation form. Form, harmony, and orchestration are all in the service of musical experience.”
is typical in this regard. In the course of a symphonic work for natural horns, the musicians—cum-horns are wedded, by dint of their instruments’ concretization of the harmonic series, to the sound of the symphony’s home key. The sound of open horns and trumpets becomes part of—even integral to—the *Klang* of harmonic resolution, making palpable this triumphant achievement of form.

In narrative approaches to the *Eroica*, the recapitulation is understood as no mere harmonic triumph, but as the protagonist’s reclaimed self-assurance, his mature state: after eradicating the seeds of doubt, his *Klang*—arched triads of the tonic collection, afforded by almost all instruments in the orchestral organism—ring out the ultimate achievement of the artist-hero from throughout the polity.\(^{71}\) Once the form achieves and maintains the major tonic in the recapitulation and coda, the hornistic personas’ participation becomes much more varied and interesting by virtue of the horn’s affordances: as these final sections unfold, the horn’s labor and particularly its role in presenting the theme increases and varies. The analytical lacuna of the missing recapitulation identified by Burnham is then specifically problematized in the total, sounding experience of the *Eroica*: it assumes that the variations in instrumentation, timbre, (and necessarily, register) that often occur in this section are not crucial to listening experience or sensation, that abstracted pitch stories, melodic motifs, and harmonic areas are enough. Indeed, the “embarrassing” repetitions are neither embarrassing nor repetitious, for, as Dolan describes, at the level of instrumentation, the recapitulation is *not* a repeat, but is a further development of orchestration.\(^{72}\) The section is one in which Beethoven and his interpreters—whether performer,

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\(^{71}\) Sipe uses the term *Klang* to describe the theme throughout his reading, wedding melodic, harmonic, and timbral parameters.

\(^{72}\) *Orchestral Revolution*, 90–135.
listener, or analyst—can deepen their engagement, and further attend to the potential of musical tone in all its valences and guises, and the labor it demands.

After the recapitulation commences, the first musician-cum-horn plays a succession of partials—p8, p10, p8, p6, p8, p10, p12—which yields a relatively familiar iteration of the hero’s theme figured on the topography of the horn’s fourth octave (mm. 412–20, ex. 1.8 below). This presentation of the *Klang* occurs after a long period of rest in the first horn part some 41 measures in length, and so is a welcome reentry for the first horn agent and in a location roughly parallel to his statement in the exposition. But note, too, that this statement is prefaced by the indication that it is “in F.” This is not an indication to a conductor or listener to switch their reading transposition, or it is not principally so; rather, it is an instruction for the performer to play on a horn with a nominal pitch in F, to effect—in actuality—a shift in the length of the horn’s corpus.

The orchestral horn would be limited indeed if it could only sound, even with the discovery of hand-horn technique, the small selection of keys it started with. Rather, once the instrument was absorbed as a tissue into the orchestral organism and its open tones normalized in the orchestral polyphony, the musician-cum-horn needed to be readily available in any number of keys.73 Luckily, orchestral hornists and trumpeters had the crook and coupler system—also called *tons* or *corps de rechange* (spare keys or spare bodies), discussed in the introductory chapter.74 The rationale for the first horn’s long rest in the retransition of the *Eroica*, then, is less

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73 Recall that notational practice of the horn has demonstrated de Souza’s observation (*Music at Hand*, 58) that “the topography of an instrumental interface is theoretically independent of any particular tuning.” The crook and its notational practices embodies this.

74 There are several different forms of crooks. The earlier “master crook and coupler system” was developed by the Leichnamschneider brothers in Vienna sometime around the early eighteenth century, where the mouthpiece of the horn is removed and the crooks, with their own mouthpiece receiver are inserted upon the leadpipe of the corpus. However, for very long keys, crooks would be coupled together, with the effect that the instrument could become
for harmonic limitation or bodily fatigue than to allow the change of crook. For the first horn in
the *Eroica*, then, the indication “in F” is not conceptual: it is an instruction for the player to
remove a bit of the horn and put a “spare body” in its place—a shorter tube so that the instrument
sounds the harmonic series in F. This changed horn facilitates the musician-*cum*-horn’s sounding
of the hero’s *Klang* in the recapitulation, where—though it appears on the page to be the same
gesture from the exposition—it is now sounded in F major (ex. 1.8).\textsuperscript{75}

Example 1.8. mm. 412–420, horn in F

This F major presentation of the theme—motivically sound but harmonically shifted—*is*
executable on the E-flat standing instrument (ex. 1.9). However, because of its distance from the
E-flat harmonic series (and thus E-flat major), the presentation in the horn would be timbrally
marked.

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\textsuperscript{75} Dauprat, *Méthode* I, 121 (in trans. Snedeker, II, 174): “It is not enough to be a good musician. Sustained attention
is also necessary, [as well as] keeping track of one’s place, [and] great comfort with the degree of pressure
appropriate to the production of such and such a sound, on whatever crook.”
While at this point in the history of the repertoire, a hornist will often change crooks (and thus the available harmonic series) between movements of a symphony or numbers of an opera, to change the standing fundamental of the instrument mid-movement is a rare direction. In essence, it is picking up a new, potentially unfamiliar instrument in the midst of the fray. To direct this change of crook—a *ton de rechange*—mid-movement is to make a bold statement about harmonic monumentalization and the way that individual instrumental timbre becomes articulated to it.

Compared to the open sonorities of the theme’s tonic arpeggio heard in the exposition, an E-flat first horn’s sound of the theme in F major, while possible, would be more variable in color and end far too dully. It would, from a timbral perspective, be too related to the minor variation of the theme that had been worked over in the development: unstable and transitional for the listener and performer alike. As Burnham identifies, in Beethoven, “harmonies are monoliths and not playing cards:” the horn does not simply play a theme in F major.\(^{77}\) Rather, to present the melodic material *on an F horn*, parallel to the statement of the theme in E-flat major in the

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\(^{76}\) The written F-sharp can also be performed as a wide-open 11 (11o); however, the result is still likely flat to ET and less stable for the hornist.

\(^{77}\) Burnham, *Beethoven Hero*, 40.
exposition but on a new cor qua corps sonore absolutely confirms F major as the intended tonic, the sound of the open horn authenticating this key.

Indeed, the German term Klang—which Sipe uses in reference to the theme—refers to a melody or tune, but also to sound more generally. The self-assured hero as theme is an F major tonic arpeggio, afforded by a horn in either key; he is also ringing (a more direct translation of Klang), extroverted, and confident, here afforded only by one.\(^78\)

In addition, horn tutors of this time emphasized that each crook, each length of horn, possessed its own overall sound color.\(^79\) Both E-flat and F were ideal keys for the horn in terms of idiomatic execution; however, the F horn is heard to be brighter in tone color. With a more brilliant sound, the F major presentation thus presents not merely a return, but a further development of the hero—aligned with what Dolan calls “developing orchestration,” yielding an “enriched recapitulation” that further advances the narrative not only at the level of harmony, but also of sound color.\(^80\) So, at the direction of the composer, the musician-at-the-horn changes the very body of the instrument to ensure proper timbral embodiment of the conquering hero.\(^81\)

\(^78\) For the hornist, the recapitulation often provides for a deeper engagement with the musical material than the exposition can provide: if the horn is to have melodic figures in the second theme area, for example, it will typically not occur until their presentation in the tonic in the recapitulation, where the fourth octave affords almost all members of the diatonic collection. I follow Dolan (Ibid.) in suggesting that analysis might gain from considering the recapitulation not as a repeat, but as an opportunity for a developmental reinvestment in traditionally secondary parameters such as instrumentation, register, and dynamic. An analysis of Brahms’ symphonies would, I believe, provide for another interesting case study here, which may also be interesting to consider in tandem with feminist critiques of sonata form theory.

\(^79\) As in Domnich, Méthode, 10–11; and Dauprat, Méthode, I, iii and 5: “What is meant here is that all the notes in the general range of the instrument must, so much the more, be understood in its different Tons [keys]: Each of them, taken individually, has its own color, timbre, character.”

\(^80\) Dolan, Orchestral Revolution, 112–17.

\(^81\) Since the ascendance of the valve horn, this material shift in the corps de cor becomes a conceptual one: the hornist shifts their transposition on their already chromatic instrument, as a pianist might. Indeed, when I mentioned this passage to (valved horn) colleagues they had often forgotten there was a transposition change at all; a natural hornist would have to remember to bring their F crook.

Despite the fact that valves had yet to be invented, this shift was actually already underway in the decade Beethoven wrote the Eroica: hand horn virtuosi in France had become so fluent in their third and fourth octave chromaticism that a new type was delimited—the cor mixte—who played all repertoire, regardless of key, on a horn in F. This new genre was generally considered a bit of a mongrel, and decried for forsaking all the advantages of the other two genres of horn (discussed below), including the alternation of open and stopped sounds and their
Second Horn: Sociality, Materiality, and Musicopoetics

Part 1: The Irreducibility of Multiple Bodies

Because of the immense range of the horn—almost four octaves, depending on the crook in use—horn players in the late Enlightenment and early Romantic were trained into one of two “types” (genres [Fr.], or Arten [Ger.]), to which an aspiring hornist would be trained from the start. These types are described in detail in the methods and treatises that emanated from Paris and Germany in the first quarter of the nineteenth century, publications that emerged with the institutionalization of professional music in the secular conservatory and with the rise of a leisured musicking middle-class. The “first horn” type (Primarius, corno primo) specialized in the higher range of the horn, tracing a compass from the third or fourth to beyond the sixteenth partial, as well as mastery of the factitious notes in between (those produced by hand-horn technique), to create an almost entirely chromatic range of approximately two-and-a-half to three octaves. (In orchestral work, this range is typically limited to two octaves, p4–p16.) Conversely, the “second horn” (Secundarius, corno secondo) specializes in the lower range, with a compass from the second to over the twelfth partial, with factitious notes below (produced by lipping, indicated by a minus sign next to the appropriate partial) and in between (produced by either lipping or by the hand), thus spanning a range of over three octaves. (In orchestral

relationship to tonality, in pursuit of mere pitch fluency in a narrow range, as in Domnich, Méthode, vii; and Dauprat Méthode I, ii–iii.

82 Dauprat, Méthode Part I, 6 (trans. Snedeker, Part I, 171): “The range of the Horn being, as we say, of four octaves, it is not possible to traverse such a large range [satisfactorily, with appropriate sound.] without using at least two mouthpieces of different diameters. Now since it is apparently impossible for the same person to get accustomed to both, in order to use them alternately, if not two instruments, at least two persons are needed: one, traversing the high and middle ranges of the Horn, plays the high part and is called First Horn, and the other, combining middle and low notes, plays the low part and is called Second Horn.”

83 Othon-Joseph Vandenbroek, Méthode Nouvelle et Raisonnée Pour Apprendre à Donner Du Cor (Paris: J.H. Naderman, 1797), 1–2; Frédéric Duvernoy, Méthode Pour Le Cor (Paris: Mme Le Roi, Imprimerie du Conservatoire de Musique, 1802), 9.
accompaniment, this range is from the facticious note written G2, which is produced by lipping p2 downward, up to p12).

These respective ranges are shown in examples 1.10 (first and third horn, discussed further in the section on the third horn) and 1.11 (second horn), which presents the expected compass of each type as notated pitches.

The pitches used throughout the Eroica (all movements, in its entirety), respective to each of the three parts, are indicated with open note heads. Pitches that appear most frequently are notated as large whole notes, where pitches that occur with less frequency are the smaller open note heads; pitches with closed heads are not used in the symphony, but are nonetheless expected as part of the mastery of this genre of horn.

Example 1.10. Compass of first and third (high) horns in E-flat

Example 1.11. Compass of the second (low) horn in E-flat

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84 The compass expectations are, like the hand technique indications, those of Domnich (Méthode). Incidentally, Domnich was trained as a second horn. There are, to my knowledge, no extant methods by Viennese hornists published around this time.

85 The compass expectations and handstopping indications are taken from Domnich, Méthode (1808). A (+) appears above to facticious notes which are produced by fully covering the throat of the instrument, similar to the modern “stop” or gestopft. Note that the third horn part ascends only to p12, indicated by the dotted line. Also note that the third horn has one instance of a notated D-sharp 5 (sounding F-sharp) in the first movement of the Eroica (mm. 276–7) that appears as the third of a diminished seventh over the tonic. This notation would indicate to the hornist to cover slightly less so as to adequately raise the pitch, where it will sound in tune with the sounded D-sharp.

86 Traditional notation for horn—so-called “old notation”—displaces pitches bass clef by an octave downward, for reasons that remain unclear to this day. This was practice until the first half of the twentieth century. The second
As with the other wind instruments among the orchestra masses, the second horn’s role is largely to support the first at harmonically appropriate intervals: customarily, the part is scored in rhythmic unison in octaves, fourths, fifths, and thirds with the first horn as the type allows. Contrary to natural assumption, however, the second horn (who occupies the “second chair” in the horn section) is not an inferior position or player than the first horn (or “first chair”): rather, as Dauprat insists, “each performer is first in his part, and” due to the extent of specialization, “one cannot replace the other, because they are equally useful in musical performance.” For this reason, Dauprat suggests new terms, cor alto and cor basse, high-horn and low-horn, to replace the potentially misleading first and second designations. The professoriate at the Conservatoire generally included a balance of the two, implying the inherent value of the basse as particular from and necessary to the alto. Moreover, some of the greatest soloists of the late Enlightenment were cor basse, including Giovanni Punto (born Jan Václav Stich), the unparalleled Bohemian virtuoso for whom Beethoven wrote his Sonata for Piano and Horn in F, op. 17, and who was, in reputation, second to none.

This value is a function of their depth of specialization, which finds that the two types “cannot in most cases exchange parts without being thwarted by the insufficiency of their means.” It is for this reason that hornists began learning duets—the part appropriate to their horn part for the Eroica, however, is written entirely in treble clef. The dashed line refers to the bottom of the high horn compass as used in the third horn part (see below).

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88 An informal poll of horn players indicates that “high horn” and “low horn” are now the preferred terms for these types. Horn players today have a general expectation of fluency throughout the full compass of the instrument, but maintain a preference for—if not an identity of—one or the other type. For the players lucky enough to have full-time orchestral positions, they will hardly ever play a part not written for their position, or at least their type. For example, in American orchestras, the third (high) or fourth (low) hornists may be seated “higher” in the section for a given work—such as to spell the first and second—but will be assigned only to the part for their type: first (high) or second (low), respectively. In European orchestras, the high players may rotate between first and third, the low between second and fourth, but still maintain type.
assigned type—and training in pairs as early as possible. Even many of the most prominent horn “soloists” of the time were, in fact, duettists, travelling in heterogenous pairs, high and low, each performing solos appropriate to their genre and then coming together for a grand duo. This specialization is Beethoven’s inheritance from the horn tradition: it was two types of horn players that were required to transverse, with appropriate sound, the full range of the instrument. While each can stand as an agent in its own right, a complete orchestral horn section is then comprised of two hornists—two different genres or Arten (or species) of musicians-cum-horns, who only together can sound the full gamut of the instrument, the complete voice of the hornistic persona.

In each and all of these tutors, the two species of horn are realized principally not by different horns nor by genetic configuration of the lips but, first and foremost, by different mouthpieces (Fr: embouchure, Ger: Mündstück). The mouthpiece serves as a kind of connector, focusing the vibrating lips of the player at the rim and funneling its pulses downward through the cup and backbore into the narrow leadpipe of the instrument. They are typically detachable from the instrument, which allows for the change of length for a terminally crooked instrument, but also allows for a single given horn to be played by either of the two types. The mouthpiece is,

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90 Dauprat, Méthode I, 39 (trans. Snedeker, Part II, 49). Dauprat, Méthode, Part II, 159 (trans. Snedeker, Part VI, 45): “Because the two types of horn are fixed, and because of their constant use in the orchestra, they must be brought together as soon as possible. Therefore, duets must always be the first music presented to horn students, after preliminary lessons.”
91 Domnich, Méthode, iii: “Chacun travaillant de son côté à perfectionner le genre qu’il avait choisi, on parvint de part et d’autre au terme extrême; et dès-lors toute l’étendue de l’instrument fut connue quoique le concours de deux individus fut nécessaire pour la parcourir en entier.”
92 Dauprat notes that high horns may play horns with slightly narrower bells or bell throats than a low horn (Méthode I, 2; trans. Snedeker, Part I, 167), but considers that a slightly too large horn is preferable over one that is too small. In the main, however, he focuses much more on the distinction between mouthpieces. Both he and Domnich before him suggest that a hornist with thinner lips may be more predisposed to the high horn; however, both insist that this is not a hard and fast rule (Ibid.). Duernoy (Méthode, 5) notes that while the overall width may vary according to lip size, the proportional distinction between the two mouthpieces must be maintained; this is echoed by Franz Joseph Fröhlich, Horn-Schule (Bonn: N. Simrock, 1811), 6.
Dauprat suggests, highly personal, and the loss of this mouthpiece could be devastating for the player. While today a mouthpiece can be reliably made again with the aid of computer-driven automated lathes, hand-wrought examples would have more natural variation, even if made to fairly exacting standards. The lips are incredibly sensitive organs, able to perceive a difference of several microns in size, for example, at the diameter of the rim.

The selection and retention of a mouthpiece, and through it, a ranged specialization, was a crucial early step in the study of the horn. The mouthpiece for the high horn type is narrower in diameter and generally a bit shallower to facilitate the execution of higher notes. However, it was recognized to be the low horn type who carries the sound advantage—naturally darker and fuller—by dint of its mouthpiece’s slightly wider diameter, deeper cup, and wider backbore as well as their placement of the mouthpiece upon the lips. Indeed, since the second horn type, the *cor basse*, was described as having the ideal sound, in this way, the first is deferential to the second.

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93 Ibid., 12.
95 Domnich (*Méthode*, 8) also mentions that the effort of the lips of the players—what I understand as the actual vibrational frequencies of the lips—is the same regardless of mouthpiece size. That is, a horn player playing A440 is, regardless of which mouthpiece or horn they are playing, is buzzing A440. The proportions of the mouthpiece (and the whole instrument) can help distribute this labor somewhat, but are not solely—or even largely—responsible for it.
96 High hornists had previously preferred a mouthpiece placement with proportionally more bottom lip than top lip. Domnich suggests that both types should cultivate the inverse, the low hornist’s two-thirds top lip, one-third bottom, for its darker and richer quality of sound (*Méthode*, 29–30). This is the standard mouthpiece placement in use today for all horn players, and prescribed without such explication in Dauprat some sixteen years later (Méthode I, 15).
First and second (high and low) horn mouthpieces from Duvernoy, *Méthode.*

The inner diameter of these archetypical mouthpieces are 16mm and 19mm in diameter across the cup, each with a 2mm rim around the circumference. Image reproduced to approximately this scale.

First and second horn mouthpieces from Domnich, *Méthode.*

The inner diameter of these archetypical mouthpieces are 18 mm and 20mm, respectively, in diameter across the cup, with a 1.5 mm rim for the first horn and 2 mm for the second.

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97 Duvernoy, *Méthode,* 4. Reginald Moreley-Pegge, *The French Horn: Some Notes on the Evolution of the Instrument and Its Technique,* Instruments of the Orchestra (London: Ernest Benn Limited, 1960), 102 identifies that the inner diameter of these archetypical mouthpieces are 16mm and 19mm in diameter across the cup, each with a 2mm rim around the circumference. Image reproduced to approximately this scale.

98 Domnich, *Méthode,* 8. Morley-Pegge (*The French Horn,* 102) identifies that the inner diameter of these archetypical mouthpieces are 18 mm and 20mm, respectively, in diameter across the cup, with a 1.5 mm rim for the first horn and 2 mm for the second.
Domnich maintains that it is both impossible for one individual to execute the full compass of the horn with a single mouthpiece and that it is not possible for a given player to use mouthpieces of differing diameters.\footnote{Domnich, Méthode, 8: “J’ai dit qu’il était impossible à même individu de parcourir, du grave à l’aigu, toutes les notes du Cor avec un seule embouchure; il lui est également impossible d’employer tour-à-tour deux embouchure de différents diamètres.

“Les limites étant ainsi posées, il fallait ou consenter à perdre une partie des avantages propres à l’instrument, ou partager en deux toute l’entendue de son exécution.”} Thus, Domnich poses, that either the horn in total loses some of its proper advantages, or else needs to divide its labor between two.\footnote{Ibid.} In none of these tutors are students advised to become fluent in both types. Rather, the student is encouraged to continually deepen their mastery of their type; the attempt to mix genres in total, Dauprat insists, harms the hornist’s efficacy in the orchestra in particular.\footnote{Dauprat, Méthode I, 9 (trans. Snedeker, Part I, 173). Note that hornists today are expected to have fair mastery of both high and low horn, beginning in the late Romantic (embodied in the virtuosic section writing of Richard Strauss) and especially in contemporary and avant garde writing for the instrument. While most horn players maintain a predilection one for the other, most players today use a moderate sized mouthpiece of about 17–18mm in diameter across the rim, splitting the difference between historical high and low horn types.

Note also that it is not as impossible as Domnich claims to switch mouthpieces, though it is not advisable to switch in the course of a work. Indeed, I have a mouthpiece on the narrow side of center for the majority of my playing that is consistent with my self-identification as a high hornist, and a slightly wider, deeper mouthpiece for extended work in the lowest keys (for example, when playing second horn on the Ninth Symphony, written for horn in C basso and particularly demanding on the bottom end of the range). The differences between these mouthpieces are experientially noticeable, though empirically small: a quarter of a millimeter in width at the rim, and a slight distinction in the depth of the cup.} Thus, if the full range of the horn requires two players, and these players play on different mouthpieces, we can consider that a complete or total hornistic persona (as Cone’s analysis might demand) is, in fact, comprised of not only two different musicians-\textit{cum}-horn, but two distinct “concrete vehicles”—two different mouthpieces in, necessarily, two distinct horns.

The difference in specialization—a function of mouthpiece selection and reinforced by rigorous training to that species—creates the conditions for further distinction between the two personas. “The voice of an instrument” such as a horn, “is not to be narrowly construed as an abstract or idea sound,” Cone writes. Rather, “it is the actual sound as conveyed through the
mechanics of an instrument by the energy and dexterity of a player, and its character depends on the potentialities and limitations thus defined. Instrumental technique, that is to say, determines the nature of the persona to the extent that it defines the possibilities available to it.”

Where the first musician-cum-horn’s technique focuses on melodic fluency in the upper tessituras of the horn’s range, the second specializes in the lower register’s idiomaticities—both melodic and harmonic passagework through extensive specialization in, among others, broken chord realization across and despite the gaps in the harmonic series.

Both Domnich and Dauprat liken the distinction between the two types to that between the violin and cello, or viola and cello, by virtue of their range and gamut. Even further, both also draw comparison to a vocalist’s tessitura, such as the distinction between a tenor and a bass voice; while both are male voices, they nonetheless possess distinct sound qualities and roles in musicking. An earlier commentator, one Ernst Ludwig Gerber went yet further, writing in the last decade of the eighteenth century that “the art of refining the tone on the solo horn has reached the greatest heights today. When a pair of virtuosi [duo hornists] mount the platform, one seems not to hear the sound of brass instruments, but a flute accompanied by a gamba.”

That is, the two parts present not merely different specializations with slight material differences, but entirely different instruments, experientially, by virtue of their constitution and preferences, if not their sound. The two musicians-cum-horn thus present different voices and agencies in the

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102 Cone, Composer’s Voice, 107.
103 As such, Dauprat’s method includes more exercises for the low horn than for the high horn.
104 Domnich, Méthode, viii; Dauprat, Méthode I, 7 (trans. Snedeker, Part I, 172), where he compares range and gamut to viola and cello.
orchestral polity, conditions created by the material distinctions and functions of their vehicles 
qua organs within the organism.

The second horn is generally among the lowest wind instruments, along with the 
bassoons, and is always the lowest brass in typical Classical orchestration before the introduction 
of trombones to the orchestral polity. The particular virtuosity of the second horn’s idiomatics 
are generally less apparent in Beethoven’s symphonic writing than in his chamber music, much 
of which was written for Punto and thus a cor basse.106 The Quintet for Piano and Winds, Op. 16 
(1796), the wildly popular Septet, Op. 20 (1800), and the Sextet for Two Horns and String 
Quartet, Op. 81b (1795) (all in the horn’s preferred key of E-flat major) each feature prominent 
writing for horn that displays the range and strengths of the cor basse: lush melodic lines in the 
middle register, on par with other wind writing, harmonically crucial Alberti bass figurations, 
and fanfarish flourishes of rapid movement across the harmonic series.107 Beethoven would later 
transcribe all of these works for various combinations of instruments, generally with a cello 
taking the second horn’s line.108 As such, its comparison to a gamba or cello seems apropos. In 
the case of these earlier works, all stemming from his first working period in Vienna, Beethoven 
may have drawing on Punto’s reputation as a reinforcement of his own—especially for the Op. 
17 Sonata in F for piano and horn—but any cor basse’s capacities for both mid-range melodic

106 By comparison, Haydn and Mozart’s symphonies present several excerpts standard to the second horn repertoire 
which employ tricky Alberti bass figurations, among other idiomaticities.
107 For more on the development of wind instruments evidenced through Beethoven’s scores, see Lawson, “The 
Development of Wind Instruments.”
108 The Op. 16 would be transcribed for piano quartet, the Septet for any number of combinations, including one for 
clarinet (or violin), cello, and piano published by the composer in 1805, and the Op. 81b sextet to strings, with the 
first horn transcribed directly to a second viola part, and the second to an additional cello to create a string sextet.
and bass figurations in the appropriate registers contribute to the second horn’s crucial role in the
chamber musicking sphere and into the massed orchestra.\textsuperscript{109}

In the orchestral organism, however, the horn section typically plays much simpler
passagework. Back in the \textit{Eroica}, following the brief \textit{tutti} first chords—on tonic in octaves (p4
and p8 of the E-flat horn)—the horns rest for the initial presentation of the hero’s theme in the
strings. They re-enter the fray by means of a highly typical figure in duo—a descending “horn
fifth”—just a few bars later (mm. 13–4). We will examine the topical significance of this figure
in the next chapter.

Example 1.12. mm. 13–18, first and second horns in E-flat

In the meantime, by virtue of the comparisons of the two types of horn to cellos, gambas, violas,
and flutes, the horn fifth can serve as both a registral and perhaps \textit{timbral} pivot from the celli to
the first winds. We can also suggest that this presentation of yoked horns—one \textit{cor alto} and one

\textsuperscript{109} Dauprat, \textit{Méthode I}, 8 (trans in Snedeker, Part I, 173): “The Low-horn, in obbligato music, knowing [how] to
profit from effects offered by slow notes, concealing the gaps which are the only imperfection of the instrument, can
combine melodied executed in the middle [range] chord patterns, [with] all species of \textit{Ideas} or \textit{Passages} which
belong to it, and the capability that it has to play, alternately, the melody and the bass, is preferred by modern
composers in music for several wind instruments,” such as the wind quintets by Anton Reicha, which remain staples
of that ensemble’s repertoire. (Incidentally, Reicha had been a friend to Beethoven in Bonn, and both lived in
Society Journal} 6 [1994]: 272): “These passages [exercises] were written in order to prove that the horn, like other
wind instruments, possess the capability to produce harmony by means of broken chords. One was limited, until the
present day, to perfect chords, but it will be seen that the horn [always had] possessed other resources” by virtue of
refined hand technique.
*cor basse*, first and second horns—on open tones of the harmonic series is a stabilizing device for the pair. For the listener, this presentation of the horn section that makes clear, perhaps, that the hornistic persona is in fact *plural* musicians or agents.

In the accompanimental melee, the *cor basse* will also regularly double the *cor alto* at the unison for several potential reasons. The most commonsense rationale is for dynamic reinforcement and balance against the orchestra, but this would only make sense if this doubling were solely deployed for material at a loud dynamic. Rather, recall that as the exposition continues and modulates to the dominant, the open tones of the horn—those generally favored in orchestral accompaniment—become more limited in efficacy. To continue playing alongside the first, the second horn will just as often double in soft passages, often on pitches that are unavailable open in the lower register. A flexible approach to doubling allows the *cor basse* to play continuously alongside the *cor alto*, at times at productive intervals, at times at the unison.

Example 1.13. mm. 122–5, first and second horns in E-flat

Example 1.14. mm. 92–4, first and second horns in E-flat
Hornists in the second chair are taught to be exceedingly conscious to match the first precisely at all times—but especially at unisons—in terms of intonation, attack, timbre, and duration. But they are also taught to trust that if the composer wanted only a wholly singular sound, he would have written for only one member of the section to play. To explicitly double the part demonstrates at least a modicum of value for each musician-\textit{cum}-instrument within the collective section—indeed, the two types are not quite the same instrument. This does not merely reinforce its individual capital within the orchestration, but also provides that by which the \textit{cor basso} can fully participate in an orchestral sociality.\textsuperscript{110}

With each musician-\textit{cum}-instrument so valued, reduction to an implicit singular persona, and the subsequent illegibility of the multiple, may not in fact be the desired goal. The consistent instrumental comparisons of the \textit{cor basso} to cello, gamba, or bass voice (as opposed to the \textit{cor alto}’s violin, flute, or tenor voice) point to musical function but also, in the research of hornists Kathryn Zevenbergen and Teunis van der Zwart, the possibility of a non-homogenous sound ideal between the two: the hornists posit that perhaps the aim of the \textit{cor basso} is not necessarily to blend perfectly with the \textit{alto}.\textsuperscript{111} As such, we may tentatively extrapolate that an even an written unison from two similar sounding bodies may not be effaced as a \textit{musical} singularity—while they may present a unified pitch, translated to a single key on the piano (which is

\textsuperscript{110} Austrian conductor Felix Weingartner suggested rewriting some passages in Beethoven’s symphonies, particularly for the second horn, to continue octave doublings in the mid-low register—now with homogenous sound or pitches made available by valved instruments—rather than have the second meet the first at the unison. Weingartner’s practice reveals a productive disconnect between \textit{Werktreue} and \textit{Texttreue}, but nonetheless functions under the regulative work-concept in implying that the work (transcendent) was hindered from full realization by the limitations of the instruments available to Beethoven (material). The resulting effect is, in my reading, to further differentiate the second horn as another voice in the polity, but to subject it to even further control. Felix Weingartner, \textit{On the Performance of Beethoven’s Symphonies} (New York: E. F. Kalmus, 1906).

\textsuperscript{111} From the abstracts of Kathryn Zevenbergen, “The Myth of the Ideal Horn Sound,” and Teunis van der Zwart, “Favouring the cor basse, a matter of diversity?,” and a collaborative lecture-recital, “Cor Alto and Cor Basse; to blend or not to blend,” all presented at \textit{Researching Performance, Performing Research Conference}, Amsterdam Conservatory, October 27–29, 2017.
nonetheless multiple in double- and triple-strung instruments)—they may present different timbres, temperaments, or slight differences in execution that are valued as an exercise in sociality and expanded sensibilities, rather than needing dismissal as poor execution in a reductive Werktreue.\textsuperscript{112} In this way, we can perceive a value placed upon a presence of multiple performing bodies—their inherent abilities (and limitations), their own fluencies and modes of engagement, their unique voices—than may be typically captured in analytical reduction.

Part II: Musicopoetics, Character, and Topic

When operating under the assumption that the designations of “first horn” and “second horn” as valuation of a hornist’s artistry, rather than a product of highly codified and valued specialization which makes each “first on his part,” it is natural to assume that all prominent solos in massed performance are given to the first horn.\textsuperscript{113} However, if and when the passage demands the particular skills of the cor basse, it will be assigned accordingly: the much-discussed preparation for the recapitulation sits in the lower register (p3–p5), so according to the rules of registral distribution and sociality in the orchestral organism it is the organ of the second horn—the cor basse—who sounds alone.\textsuperscript{114}

\textsuperscript{112} Of course, I recognize this logic may be at work most saliently in string section playing; however, there is not a control for the number of bodies at work where in the case of the horn parts, two (or three) performers are specifically called for. Note, however, that in the first half of the nineteenth century, doubling of wind and brass parts was a regular practice in the performance of Beethoven’s symphonies as concert halls and audiences grew bigger and more sound was needed from the orchestra, or as a demonstration of the sheer sonorous power of instrumental music.

\textsuperscript{113} Dauprat, \textit{Méthode} I, 7 (trans. Snedeker, Part I, 171).

\textsuperscript{114} Dauprat, \textit{Méthode} I, 8 (trans. Snedeker, Part I, 173): “Meanwhile, solos in the orchestra can be alternately for one or the other type of Horn, according to the Key upon which they are composed, and the range they traverse. This is also a good point to call to composers’ attention, who [then] will find more variety, at the same time they encourage and propagate the two types equally.”

Indeed, through the mechanism of reduction and the continued force of the misunderstanding, \textit{The Oxford History of Western Music} assigns this solo to the first horn.

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This is not the only example of such assignment: the *cor basse* also has prominent solos in the overture to Beethoven’s *Fidelio* (mm. 45–55) and in the slow movement of the Ninth Symphony (mm. 82–123), where the musical flexibility of the *cor basse* is put on full display as both the bass instrument in the woodwind consort (in lieu of the second bassoon) and a melodic soloist through the entire middle range of the instrument, before plunging again to its depths in its characteristic arpeggiated gestures.\(^{115}\) However, solos from the second chair remain relatively uncommon, and so it may be somewhat forgivable that at the rehearsal of the *Eroica* Ries heard this unexpected middle-register entrance of the *Klang* as mistake on the part of the *cor basse* and almost earned himself a box on the ear from the perturbed composer. It was, perhaps, not merely the clash of dominant and tonic harmony or the overlapping of formal sections that disturbed, but also that it came from the second in the section.\(^{116}\)

\(^{115}\) This latter solo, assigned to the fourth horn (where the first pair of horns is pitched in B-flat, the tonic of the movement, and the second pair is pitched in E-flat, the prevailing tonic in this section; this is the second horn of that pair), is one of the longest in the repertoire and a fixture of low horn auditions. Weingartner (*Beethoven Symphonies*, 169) was puzzled as to the assignment to the fourth and suggested reassignment to the first or third horn because they are more accustomed to soloing. Most hornists would find this suggestion appalling, and, by virtue of its low register work, this solo would have been exceedingly difficult for a traditionally trained *cor alto*, but well within the affordances of the *cor basse*. See Lawson, “Wind Development,” 88; and W. F. H. Blandford, “The Fourth Horn in the Choral Symphony, Part I,” *The Musical Times* 66, no. 983 (January 1, 1925): 29–32; Blandford, “The Fourth Horn in the Choral Symphony, Part II,” *The Musical Times* 66, no. 984 (February 1, 1925): 124–9.

\(^{116}\) “At the first rehearsal of the symphony, which was horrible, but at which the horn player made his entry correctly, I stood beside Beethoven, and, thinking that a blunder had been made, I said: ‘Can’t the damned hornist count?—it’s so obviously wrong!’ I think I came pretty close to receiving a box on the ear. Beethoven did not forgive the slip for a long time.” Ferdinand Ries, *Biographische Notizen über Ludwig van Beethoven* (1838), in O. G. Sonneck, ed., *Beethoven: Impressions by His Contemporaries* (New York: Schirmer, 1926), 54.
Example 1.15. mm. 382–407, full orchestra
Analysts have all stood before this moment—a *cumulus*, a *coup de théâtre*, a “stroke of genius” over which Beethoven himself similarly labored—as a crucial moment in their weaving of narrative, but an elusive one.\(^{117}\) Burnham’s nuanced reading of this moment is worth quoting at length:

The horn call combines in one mysterious utterance the essence of the theme (a triadic call) and the essential crux of its presentation (the downbeat-oriented tonic…). … Answering the elemental with the elemental—whispering, as it were, the magic word.

…The appearance of the first theme as a military horn call takes on a communicative function hovering suggestively between the referential and the phatic. In other words, the horn call both represents the hero and summons him by name…

But the abstracted essence (both the triadic and poetic) of the first theme here heralds rather than enacts the important thematic return; or, semantically speaking, this use of the theme stands not for the hero himself but his name. Thus the poetic essence of the character of the hero (a military horn call) is used to name the hero.\(^{118}\)

Let us examine this passage in several parts. First, we have already observed how the horn affords the theme: the triadic call is afforded by the pitches of the harmonic series, sounded by the *cor qua corps sonore*. These pitches—and thus this simple theme—are available in two octaves: the fourth octave, heard in E-flat in the first horn, as well as the third octave, the provenance of the second horn. We can observe that, like the first horn’s impending presentation of the hero’s theme in F, the presentation in the second horn here monumentalizes both the return of this theme and the tonic major despite the prevailing dominant harmony. Moreover, the uncanny concomitance that Burnham cites is further reinforced by of the hornist’s wedding of


\(^{118}\) Burnham, *Beethoven Hero*, 16.
open sounds to tonic tonality, since both are built upon the harmonic series—a kind of musical elementalism that remains the privilege of instruments that sound the resonating body. Since the first horn—or any yet more fluent instrument—can sound this theme in any number of keys in its range, or since the harmonic series would afford it in higher octaves, the second horn’s presentation in the lower range emphasizes that the theme is not a mere arpeggio (the bare skeleton of tonality that gives rise to a theme some have called “banal”) but rather suggests that its fundamental source of the hero’s power is, perhaps, the harmonic series itself, the fertile soil from which Western harmony was built. (This, too, is at play in the first horn’s change of crook, to sound this theme in F.) Unlike the cellos, violins, or even the winds, the horn—and the low horn’s presentation in particular—enacts the re-binding of the elemental with the elemental by virtue of the limited affordances of its concrete vehicle. It is not the mere fact of theme re-encountering the tonic harmony: the long habituated timbral associations of the open horn—the *corps sonore* and *cor sonore*—deepen the sense of elementality, the reintegration of concepts pried apart and worked over in the development of the movement and under the regulative work-concept in the decades that would follow—harmony, pitch, timbre—in present, material sound, in *Klang*.

In her work on orchestration, Dolan describes how burgeoning Romantic aesthetics, deeply indebted to Kant, yielded a “new discourse of character:” within the orchestra polity, the timbres of certain instruments are more marked than others.\(^{119}\) In Michaelis’ rendering, the strings can give “true aesthetic pleasure” because they help the listener contemplate the work’s form; the winds, by contrast, provide immediate pleasure through their sensuous charm, perhaps

“too much that excites and fills out. They mix more materiality into our pleasure.” Thus the orchestra (and its building up in the repertoire, orchestration) created “an aesthetic system that organized instruments according to their expressive capacity.” These capacities were tied to their function within the organism—as we might imagine of the two genres of horn, cor alto and cor basso—but these voices also threaten gnostic contemplation with their distinct timbres, mundanity, and extra-musical referentiality.

Wind instruments in particular have long prehistories as instruments of function—echoes of signals sounded across field and forest that continue to reverberate in the concert hall. In fact, these instruments were first brought indoors to directly index hunting, battle, pastoral and other scenes in musico-dramatic narratives—alongside but not within the orchestra—and these associations continued, though more vaguely, once they were absorbed into the orchestral polity. For example, Haydn’s symphonic trumpets and timpani typically carried a whiff of the militaristic for eighteenth century listeners, and horns—particularly when playing in compound-based meters on the open tones of the harmonic series—sounded of the hunt. Even once normalized into the orchestral organism, “trumpets were instruments of war; violins were instruments of music.” Thus the first theme in the cellos can present, somewhat transparently, the entirely musical figure of the hero who can be subject to all forms of development and organic growth, the individual subject; the winds present the forces of the world—extra-musical—upon him.

In light of these historical associations, hearing of the second horn entrance as a “military horn call” may seem a bit muddled—trumpets were instruments of war, horns were instruments

\[120\] Ibid.  
\[121\] Ibid.  
\[122\] Ibid.
of the hunt—though it is echoed by a number of commentators. To pull this less-than-casual reference apart, we turn to the semiotic device of the musical topic. Topic refers to figures of musical discourse that are taken out of original, often “extra-musical” contexts and placed in other, explicitly “musical” contexts, collected and employed in the concert music of late Enlightenment. This veritable universe of cross-reference was first identified by Leonard Ratner, and has since developed into a sub-discipline of music theory and analysis—or more properly, musical semiotics. Because of their particular histories, the horn and trumpet both figure prominently as both topical signifiers and signifieds, and are central foci in Raymond Monelle’s book *The Hunt, the Military, the Pastoral*. These signifieds—the hunt and war—were, by the end of Enlightenment, less manifest in programmatic, blow-by-blow narrations or direct representations, than re-embodied in stylized figures to symbolize vague, idealized concepts which had come to surround these activities: euphoria, heroism, valor, chivalry.

Topics can manifest through the mobilization of genres, such as the march; characteristic rhythms, tempi, and meter, such as with Baroque dances; pitch collections, such as the harmonic series; or mere instrumentation. Thus the sound of the trumpet, in and for itself, came to be the sound of war, of heroism and valor; the horn, the sound of the hunt, chivalry, and simple pleasure. While these activities and their related values are somewhat different, they shared

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125 Interestingly, Monelle (*Hunt, Military, Pastoral*, 100) cites the second horn entrance in his discussion of the hunt signified, reading the horn entrance as a belated timbral confirmation of the presence of the *hunt* in the first
chivalric associations in the late eighteenth century. There is, however, a more basic unity of functionalized instrumental sound between the two: both trumpets and horns were used to communicate across fields and other expanses. Writing of the imaginary posthorn in Schubert’s song cycle Die Winterreise (an implied virtual horn agent portrayed by the piano), Roger Moseley pithily notes: “The message is that a message is being sent.”

If Beethoven’s theme, initially presented in the cellos, presents the musical figure of the hero, the horn calls out to him, harkening to him and the listener. It seems that even in this quiet moment, the open horn, no matter how soft or low in register, cannot shake its iconic historical function—a horn call will always be a horn call. The horn does not sound like anything else: the medium is the message. In this way, beyond the formal considerations of a not-yet-achieved recapitulatory tonic, structural downbeats and upbeats, the horn may never be an empty enough sign to be the embodiment of the hero.

Thus the call is typically read as a distant summons from the battlefield—though it might be filtered through the hero’s perspective—that brings the hero to will or self-consciousness. However, if the trumpets were the instruments of war signified, how does the militaristic aspect adhere here, in the second horn? In his investigation of the military signified, Monelle notes that both cylindrical and conical bore instruments were used in the army: the long yet narrow cylindrical trumpet, controlled by guild association and at the service of the aristocracy, was

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127 Even in Richard Strauss’s Ein Heldenleben, a solo horn call surfs alongside with the cello section for the opening representation of the artist-hero (mm. 1–17).

128 While Cone’s musical utterance can be of many dramatistic types, “In every case there is a [single] musical persona that is the experiencing subject of the entire composition, in whose thought the play, or narrative, or reverie, takes place—whose inner life the music communicates by means of symbolic gesture” (Cone, Composer’s Voice, 94; emphasis mine). “Every musical gesture conveys an idea or image in the minds of the agent making the gesture and of the musical persona” (Ibid., 92; emphasis mine).
heard to lead the cavalry charge. The infantry, on the other hand, was amassed from the lower classes and their signalers from the huntsmen and foresters who blew upon the shorter half-moon conical horn—called a Halbmond, Flügel, or bugle—which would later be wound to resemble a trumpet shape and give rise to the modern bugle upon which ceremonial signals are heard to this day.  

Monelle notes that by the end of the eighteenth century popular culture had largely developed a distrust of the average soldier, held contempt for the bravado of aristocratic army officers, and sought a general “banishment of the ensigns of war and bloodshed from the intercourse of civil life.” As such, while soldiers may no longer have been admired in representational theater, instrumental “musicians returned continually to the military topic, almost always in the euphoric vein. They expressed, not the reputation of the contemporary army, but the persistent myth of the warrior…. a dream of heroism rather than the reality of fighting.” To be too literal in one’s figuration—as in Figaro’s aria “Non piu andrai” from Le Nozze di Figaro, which mocks Cherubino’s pending enlistment—would have been to partake in contemporary cynicism. Rather, in order to invoke the cultural theme of the ancient heroic warrior in the euphoric vein, one had to adapt and distort the army signal—perhaps by putting it in a related instrument.

A key to legibility of a specifically militaristic topic in this moment of the first movement of the Eroica is, I believe, in the instruments’ shared pitch affordances: the third octave of harmonic series, where the cavalry trumpeter primarily played. While both orchestral.

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129 Monelle, *Hunt, Military, Pastoral*, 138–141. The mouthpiece for these instruments is, however, more cup-shaped and trumpet-like.
130 Ibid. Recall that Roland also blew an Oliphant, a conical signal horn fashioned from an elephant’s tusk.
instruments are written in the same octave, Beethoven’s E-flat trumpeter—like the cavalry counterpart—would sound an octave higher than the horn. The quiet heroism of the topic, which refutes any cynicism, manifests in this sounding octave displacement, out of range of the trumpet and the first horn, the provenance of the cor basse.

Beyond the extra-musical reference, the second horn figure adds functional momentum as retransition statement since it is heard in the same octave as the initial and cello presentation; when we hear the cellos play the theme again at the top of the recapitulation, we might hear less tonic triad and more of the harmonic series. Glancing back to the exposition, Wilson describes that the voicing of the opening chords of the entire movement as dramatic E-flat “pillar chords.”134 These tonic harmonies are voiced as p2–p8 of the harmonic series, “the E-flat horn’s deepest tones stacked vertically”—but this is not just a horn, but a second horn.135 He considers it to be “a sonic metaphor… a horn does not even need to be in the room for its spirit to be present.”136 Thus the re-entry of the horns just a few bars later (mm.13–14) can be read as a timbral confirmation of the complex interrelations of tonality, the harmonic series, the hero, and the horn present from the very first, before we even hear the Klang. The sounding of the second horn to launch the recapitulation reminds us that the horn was already there, waiting for us to acknowledge it.

In Italo Calvino’s short story “A King Listens,” the titular sovereign speaks to himself in a state of paranoia—speaking in the second person, he is at once the singular experiencing agent

135 Ibid.
136 Ibid., 174.
of the story and its sole addressee. Unable to move from the throne, throne room, or palace, he aurally surveys the palace and city for any sign of rebellion. The palace and kingdom become co-extensive with the king’s body, wholly within his absolute power yet threateningly outside of his control. Even the daily blast of the trumpet, if done with “too much precision,” provides not comfort in its regularity but an aural sign that a coup is underway; the bits of music that drift up from the city give not aesthetic pleasure, but carry information, signals. The palace walls and his heart pound with potentially threatening messages in code, or else he calms himself with the surety of his sovereign will imposed on every moment of every day, every thing. The king is a taut string, anticipating any movement which reverberates though his ear–body–palace.

The only sound that can break his paranoid ruminations is the voice of a woman singing somewhere in the city. He desires not the woman, but “the voice as a voice,” for “that voice comes certainly from a person, unique, inimitable like every person…. A voice means this: there is a living person, throat, chest, feelings, who sends into the air this voice, different from all other voices. A voice involves the throat, saliva, infancy, the patina of experienced life, the mind’s intentions, the pleasure of giving a personal form to sound waves.” The exteriority of this voice—as image-voice—is all that can bring the listener out of his ruminations.

The massed orchestral organism—musicians-cum-reeds, -cum-horns, and -cum-strings—falls to the dominant in hushed tones; the distributed body watches and wait. Measure-long

138 Ibid., 44.
139 Ibid., 53–4.
140 Dolan (Orchestral Revolution, 79) notes that “timbre… was for Herder a proof that a listener, in hearing such impassioned tones, did not experience a mere ‘raw’ sensation, but something always already imbued with aesthetic qualities.”
dominant seventh chords exhale from the winds, like anxious breaths; the nervous *pizzicati* in the strings rap on the third beat of each measure, all on B-flat in their lowest octave. Anxiety is heightened as the first and second violins tremolo a minor third, then close the gap to a major second, the barest outline of the third inversion of the dominant seventh. The active stillness quivers with anticipation: the king—the protagonist, the hero, you—listen.

It cannot be the trumpet; the trumpet is too threatening. It could be a flute or oboe, evoking the pastoral, but the mid-range tension asks for a lower voice. It is the second horn, but the musician-*cum-*horn enters before the form indicates it should be, frustratingly outside its control, and paints onto the bare musical theme its timbre, laden with its own desires to signify, to communicate, its personal form: the second horn entry is not the figure of the mythic hero—the musico-thematic protagonist of the sonata-allegro drive—but another voice, phatic. The second hornist—another individual, different from all other voices, inimitable like every other—sounds from afar, a voice outside yourself, stirring you to consciousness.

**The Odd Third Horn**

The *Eroica* Symphony is cited as a work of unprecedented scope and organicism. This is due to the work’s overall length as well as expansion of the Classical sonata-allegro form with an extended development and weighty coda. Less commented upon is that Beethoven added a third horn, a quite “unusual” and “heterogenous” element to a work already described as such.\(^{141}\)

Most saliently and logically, this third horn in the *Eroica* will function as a third member of a trio of horns in E-flat. The most famous horn trio in the Symphony—the raucous hunting trio, appropriately found in the Trio section of Scherzo (ex. 1.16)—may be the reason Beethoven

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\(^{141}\) As the symphony is described in total in the review in *Der Freymüthige*, 4 August 1806, cited above and in Sipe, *Eroica*, 54–55.
included this supernumerary; however, as we will see, Beethoven found ways that this additional hornist could be put to use elsewhere. We can observe that the third hornist does not function as the lowest member of the trio, as might be expected if the parts were simply distributed downward through the section; rather, he fills in the chords from the middle, as was the custom within the horn trio genre.\footnote{N.B. Pace Klorman’s analyses in \textit{Mozart’s Music of Friends}, I retain the male gendered pronoun here because, without any known exception, any player of Beethoven’s symphonic works during his lifetime would have been male. I shift pronouns later in the project to reflect changes in subjectivity.}

Example 1.16. III. Scherzo, mm. 176–181, horns in E-flat

Domnich notes that the third part of any horn trio, then, is typically “easiest” because it is a compromise between the two types; that is to say, the third hornist does not generally partake in
the extreme high range of a first horn, nor extreme low range if a second. Yet due to the specialization in training that hornists received, a horn trio would nonetheless be comprised of a first horn, a second horn, and an additional first or second horn. (Indeed, Grove cites a prefatory notice to the first edition that clarifies the Arten of the third horn: that it can be played by a first or second horn type.) Since he does present a bit of a compromise between the two, the third musician-cum-horn in the symphony has a more circumscribed range than that of his compatriots, operating between p4 and 12—within the shared range of high and low horn—as a proper middle voice. (For reasons that will become clear in a moment, the third horn’s range is included in ex. 1.10 above with the first horn; the dotted bar line in the example shows the terminus of its range in the symphony.)

While narrower in terms of range, the third musician-cum-horn’s particular skills and labor are crucial to the right sounding of horn section qua organ. The effect of a given chord is diminished if its intonation is compromised—and particularly by the middle voices, which require more deviation by equal temperament standards—so he must carefully tune to and be in balance with the outlines set by his section-mates. The third of the major chord, for example, must be placed fourteen cents below equal temperament in order to create a beatless, just intoned chord. Luckily, the fifth and tenth partials—the most conspicuous major thirds in the harmonic series—place this tone in ideal intonation when the horn is sounded as corps sonore. The fifth

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143 Domnich, Méthode, viii.
144 Ibid.
146 While orchestras may sound in a variety of temperaments, and in different ones for the melodic and harmonic axes, they rarely sound in harmonic equal temperament. In general, brass instrumentalists in particular are rigorously trained to sound in just intonation within harmonies, as the resulting acoustic difference tones create as alluded to in the opening chords of the Eroica, “pillars” of sound and harmonic reinforcement, as well as ease of playing, since the instruments qua corps sonore already privilege the harmonic series and its just intoned placements.

Intonation and temperament, crucial in the training and performance of the hornist, will be taken up in the fourth chapter.
partial can be a bit squirrely for the musician-cum-horn to hit just in tune, with a wide envelope for lipping.\textsuperscript{147} The reward for his efforts, however, is palpable as the primarily open sounds and resonant chords of this trio grant a marvelous effect.

Two horns—one alto, one basse—were the norm for the orchestra both in terms of the repertoire and the ensembles that performed it through the 1790s.\textsuperscript{148} Even in the decades following, when more hornistic personas may be needed but could not otherwise be obtained or justified, composers found clever stop-gaps. For example, in his Fourth Symphony, Op. 90, Felix Mendelssohn writes for a “horn quartet” comprised of two horns and two bassoons. Indeed, double reeds are not all that different from conoidal lip-reed instruments: by virtue of their similar modes of sound production, conical bore, complex timbre, and range, the voice of a bassoon can make a passable replacement for that of a horn. We see this similarly employed by Beethoven in the Fifth Symphony: in the exposition, the two horns (in E-flat, the third of the C minor tonic) play a prominent rendition of the theme \textit{qua} fanfare to announce the second theme area in E-flat (mm. 59–62). Due to the harmonic prerogatives of the recapitulation section, however, the horns in the Fifth cannot play the theme (now in C major) on open partials upon their E-flat length instruments, and the polity cannot afford to have the horns out of commission for the length of time it would take to change the crook and back; thus Beethoven reassigns this fanfare to the bassoons (mm. 303–306).\textsuperscript{149} As the orchestra expanded in the following decades—

\textsuperscript{147} The “pitch envelope” afforded by the horn—that is, the give it has to sound a certain partial of the harmonic series before “jumping” to another partial—is larger the further down the series; this explains why the \textit{cor basse} can lip p2 downward in excess of three semitones. Conversely, as the horn player ascends, the lipping envelopes (like the pitch classes themselves) become narrower.


\textsuperscript{149} Some modern performances reassign this passage to (valved) horns, as Weingartner suggests, following the logic that “this is certainly what Beethoven would have done, had all our instruments been at his disposal” (\textit{Performance of Beethoven’s Symphonies}, 76).
which included almost doubling the size of the string section, experiments with expanding the
wind consort with additional players (and improvements that make the individual instruments
more powerful), and the addition of permanent trumpets and trombones—orchestras also
experimented with retaining four and even six horns before settling upon four players: the
standard number of horn parts in the orchestral polity today.\textsuperscript{150}

As we examined before, in more adventurous symphonic writing of the eighteenth
century there may have been two pairs—two different keys—of horns: each pair would contain
both \textit{alto} and \textit{basse} roles, and ultimately each pair would function, more or less, as an individual
section, as distinct from the other pair of horns as they would be from the trumpets. But in this
first movement of the \textit{Eroica}, this third horn is without a partner to establish his own completely
distinct horn organ, and is set in E-flat along with the pair.\textsuperscript{151}

Recall that, in the retransition and first part of the recapitulation, the first musician-\textit{cum-cornalto} cannot fulfill his obligation to his \textit{basse} partner because he has to adjust the instrument’s
length order to fulfill an instrumentally poetic and thematic imperative. While the first horn is
occupied with their \textit{corps de rechange} for the recapitulatory statement in F, the third horn part
assumes the typical yoked pairing to the second, functioning as the \textit{de jure} first horn in E-flat.\textsuperscript{152}

\textsuperscript{150} This history is traced in Koury, \textit{Size, Proportions, and Seating}, 143–162. Note that professional orchestral horn
sections today typically retain at least \textit{five} players: a principal performer on each part as well as a supernumerary
player, called an “assistant” or a “bumper.” Typically, this musician-\textit{cum-horn} will read along with the first part,
doubling the first horn at particularly loud passages or playing instead of the first to grant the principal some
reprieve. On the stage, this supernumerary will typically sit to the left of the principal horn, annexed to the rest of
the section, which is seated as a unit in a single descending line or in a square formation. This supernumerary may
also take on a principal part of their own if the parts exceed the traditional four. In addition, some orchestras also
retain an “associate” or “co-principal” who will play the first horn part \textit{in lieu} of the titular principal, typically on the
first (lighter) half of the concert program, or will take fifth horn when needed. In all cases, these hornists—associate
or assistant—audition as high horn players.

\textsuperscript{151} Note that, for the second movement \textit{Marcia funebre} in C minor, the first and second horns will adjust their length
to 16-foot C ‘basso,’ but the third horn will remain in E-flat; therefore, he will almost always sound higher pitches
than the first horn, even if his notated range is not as extreme.

\textsuperscript{152} I do notice in recordings that this redistribution seems to throw off the balance of the section: the players seem
less comfortable in this set-up—the intonation feels less stable and there may be a few more chipped notes.
The third horn is thus a crucial reservist, allowing the second musician-\textit{cum}-horn to continually fulfill his role in the accompaniment as second-\textit{to} while emancipating the first horn from its standing in in E-flat to accomplish the \textit{Klang} on newly confident, open sounds in F. From this perspective, the musician-\textit{cum}-horn in F (the “first horn”) becomes the uncanny, odd third horn against the typical yoked pair in E-flat.\footnote{Since the third horn is a \textit{cor alto}, it would have been conceivable to place this F major solo in the third horn. (Indeed, given his instrumentation tendencies for the horns, Brahms may have opted to do so were it his composition.) While pure speculation on my part, I assume the first horn is given the solo because it sits more comfortably within his compass for the work in total; although, it may have also just been force of habit.} Examination of the third part indicates that, despite its role as a middle voice within the horn trio sections, and the possibility of being played either by a first- or second-type, the third musician-\textit{cum}-horn here \textit{functions} as a the high horn type—a “first horn” in the older appellations: he will almost never play lower than the second and crosses the first horn part when the first and second are yoked in octaves, and thus sounds the highest voice of the trio (ex. 1.17; also, mm. 30–5; mm. 65–9; mm. 124–8; mm. 227–31; mm. 655–661).

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{example1.17.png}
\caption{Example 1.17. I. Allegro, mm. 227–31, horns in E-flat}
\end{figure}

This odd third musician-\textit{cum}-horn—this \textit{spare body} who exceeds the internal symmetries of the orchestral organism, a whole other instrumentalist with its abilities, needs, and voice—allows for Beethoven’s creative freedom to manifest in new agencies for the hornistic personas, and perhaps the horns and their players themselves.\footnote{As Szendy (\textit{Phantom Limbs}, 11) writes: “The musical \textit{corps à corps} experience”—the experience of body-to-body contact, to “presence”—“would produce inventions of improbable bodies that are still without figure or destination. Bodies that are neither monstrous nor fabulous, neither glorious nor weak nor empty: simple but powerful thrusts from even before the drives [of ego and id], from ‘behind’; threats or traces of still unorganized organs—neither living nor dead—that are remembering, dismembering, hurrying, crowding, growing, ramifying.”}

The result of this vocalic remainder beyond the
standard needs of the horn section and the orchestral organism writ large is that the third horn plays as a free agent in line with, or even beyond, the horn’s already remarkably variable agencies as both a brass and woodwind instrument. This is partly by virtue of third hornist’s refined hand horn technique; in some ways this part is more demanding in terms of this style than the first, not least because more technique is needed to produce inner pitches within the trio when not sounding open partials. The particular virtuosity and independence of this hornist is best displayed in the coda section.

Now that the first horn has returned its standing to E-flat, and thus his role as the first horn in the horn duo, the third horn is again free to roam the orchestral polity. He plays with the first and second horn: at times his line shows great independence of movement as an inner voice within the trio (e.g. mm. 528–538). In the coda’s “second development,” the third horn—not the first, as in the development proper—plays a chromatic line with the bassoons and cellos (ex. 1.18).155 This passage demonstrates all the rules of proper writing for the hand horn—beginning on open partials for security and at a soft dynamic for easier balance between open and closed tones—and exploits the particular affordances of the musician-cum-hand horn, including light timbral variety on the written E-flats, though this would be largely obscured through doubling.

![Example 1.18. mm. 593–599, third horn in E-flat](image)

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155 The first and second horns here, resuming their yoked pairing qua organ, play a simple accompaniment figure of repeated Gs in octaves.
This passage well demonstrates that the horn was already a chromatic instrument before the invention of valves one decade later, and to which we will turn in the next chapter. Moreover, it demonstrates a new kind of sociality or egalitarianism available to the musician-cum-horn by virtue of its chromaticism, and of the independence and personality of this third horn agent in particular.  

Beethoven was already quite familiar with fluid and adaptive instrumentation practices in wind writing: he had already won favor with the aforementioned Piano and Wind Quintet, Op. 16, and especially the “ingratiating” Septet for strings and winds, Op. 20. In these works, the bassoon or clarinet could be a stand in for a second horn. For the Eroica, however, it was crucial to have at a pair of actual horns at all times, yet he required a third musician-cum-horn to accomplish this. This excess provided for the stuff of creative experimentation, and as a result, the horn can be both true to its nature and at the same time, something more. Therefore, we might see that here, at least, the horn here was not simply interchangeable with another instrument; timbre, instrumentation, and materiality are foundational to presence in the work and potentially crucial sites of experimentation and delimitation.

Rather than totality, autonomy, idée, and transcendence, what we come to observe from this close reading of these parts is that there may be a commitment to instrumental training—always already social imperatives—that cannot be ignored analytically. That is, we are verging upon ethics. This is especially the case not only in our sense of presence to the work, in our

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156 Dolan (Orchestral Revolution, 164) writes that in the Schillerian “aesthetic state” of the orchestra, “Instruments possessed the quality of having character. To put it another way, instrumental character was a sign of freedom and aesthetic completeness.”

157 Early reception in Der Freymüthige (1806), quoted in Sipe, Eroica, 54. Dvorak’s Serenade, op. 44 (1878), a chamber work for wind instruments, cello, and bass, includes three horn parts that reflect these individual agencies.
commitments to Beethoven’s hero or to Beethoven himself, or to even to human transcendence, but in our posture of attention to live through and with experience of others, of the bodies that find their own way to call out, to live up to their names.

**Coda: Conclusions**

While watching the full score, but conspicuously absent in reduction, the horn staves will come and go, an attempt to save space and clear non-sounding instrumental lines from view. Yet the musicians-*cum*-horn remain on stage, counting rests as part of their musical labor and no less participants in the musicking for it. By the very presence of their non-sounding bodies before our eyes, we recognize that there are choices: when to sound a body and when to rest, when to listen, when to close our eyes and make the orchestra disappear. The story of the *Eroica* is one of human action and will, but not only metaphorically or in a past mythology. One of the stories, I contend, is of ever-present bodies—musicians-*cum*-instruments and, as we will see in the next chapter, their instruments too—implicated through timbre and instrumentation into material sound and human presence. Does it remain a story of struggle, of autonomy, or could it become a story of something else? When confronted with multiplying bodies, how do we sustain the narrative and the formation of the individual?

Readings of the *Eroica* rely upon the idea of the hero as a thematic entity, a transcendent motivic singularity or complete musical consciousness winding his way through the battlefield of sonata-allegro form. As I have remarked, the horn does not play this theme at the outset, because of the horn’s strange, qualified access to the C-sharp. In this way, the horn cannot provide the hero’s original flicker of doubt or the narrative stumbling block around which most readings of
the movement turn, especially if the horn—as functional, even as an “extra-musical” agent—is deputized to serve as that voice outside of himself which stirs him to action.

The horns become most closely associated with that theme in its multiple guises in the recapitulation, after the hero has mostly transcended his limitation, whether his obstacle is an external foe or his own psyche. The lengthy coda to the movement has already been identified as a kind of second development, but once the tonic is restored again, the three horns play a particularly consistent and salient role, featuring some of the longest stretches of uninterrupted and active playing in the movement.\textsuperscript{158} In particular, as we have observed, the timbre of the horn became tied to the theme as \textit{Klang}, the sheer sound providing at least in part the sense of fullness, as much as any harmonic or melodic monumentalization. Burnham describes the theme here as a “balanced exchange of tonic and dominant,” insisting upon the fifth scale degree, “keeping alive the unresolved feeling of a dominant-heavy melody. This [harmonic] openness suggests the possibility of endless repetitions, endless affirmation.”\textsuperscript{159} And that is precisely how the horn functions in this apotheosis, providing confirmation and manifold variation upon the theme. The emphasis of tonic and dominant afforded by the harmonic series—the horn’s \textit{habitus} as \textit{cor sonore}—provides for this abundant application.

By measure 630 (ex. 1.19, below), the first horn has already sounded the recapitulation’s F major statement and replaced the E-flat crook, and the third horn has joined strings and winds in a functional second development (ex. 1.18, above). The first horn intones the simple theme in a most complete statement, eight bars in length. As the first holds the fifth scale degree in the fourth measure, the second joins in an echo of the first (m. 634). Following the four-bar

\footnotesize
\textsuperscript{158} In Burnham, \textit{Beethoven Hero}, 21.
\textsuperscript{159} \textit{Ibid.}, 19.
sequence, the violins take up the principal burden of the theme, but the third horn joins the first two to create an echo of this melodic theme in full-bodied triads (mm. 645–52). It is one of the few moments of full section melodic writing in the entire movement that fully utilizes the capacities of the trio, indicating a total self-actualization, the hero cloaked in the sound of another affirming his name.

Example 1.19. mm. 631–652, horns in E-flat
Before this bountiful presentation in the reclaimed tonic, the trio presents a unique statement of the theme in E-flat minor. The theme is divided across the three E-flat horns, each playing in turn or in pairs as their role demands and amply provides.

This divided presentation is not one of mere egalitarianism. It demonstrates that these instrumental socialities and relationships are not—or need not be—interchangeable, that each come with their own role and abilities, their own way of traversing the terrain of the piece, be it the battlefield of the narrative or the score of the absolute work. The pitch story of the “self-creating,” “autonomous” Romantic individual\(^\text{160}\)—the virtual agent of a singular musical line we hear, the composer’s voice—is a function of the collective sounding and labor of real and present orchestral subjects-*cum*-instruments. Burnham writes, “Thus the sense of presence we detect in this music not only involves the enhancement of the present moment but is intensified to such a

\(^{160}\) from Solomon, quoted in Sipe, *Eroica*, 74.
degree that the temporal sense of presence becomes an uncanny sense of the presence of another order of being.”¹⁶¹ Rather, I consider this another ordering of being, perhaps—interdependency, organization of the corporate body—where each participates as he is able and no one actor has to carry the burden. Rather than individual triumph, prowess, or even courage, it is resonant fraternité which gives rise to a hero.

While analysts continue to proliferate singular individuals who can stand in for the hero—and perhaps even become a little heroic themselves by identifying him—we do know that the original hero of the Eroica was struck from the dedication. Ferdinand Ries reported:

I was the first to tell him the news that Bonaparte had declared himself emperor, whereupon he flew into a rage and shouted: “So he too is nothing more than an ordinary man. Now he will also trample all human rights underfoot, and only pander to his own ambition; he will place himself above everyone else and become a tyrant!” Beethoven went to the table, took hold of the title page at the top, ripped it all the way through, and flung it on the floor. The first page was written anew and only then did the symphony receive the title Sinfonia eroica.¹⁶²

The democratic promise of the revolution was swept aside by the republican tragedy of Bonaparte’s desire for power. In a symphonic polity, however, no one actor—performer, composer, listener, or analyst—can be the hero or rightly claim the position for himself. Rather, it is the collective organism, the corporate voice of all that gives rise to the leader; the resounding multiple comes together to summon one, and to grant him a name.

¹⁶¹ Burnham, Beethoven Hero, 34.
¹⁶² Quoted in Sipe, Eroica, 31.
CHAPTER TWO

RE-MEMBERING THE BODY in BRAHMS’S TRIO, Op. 40

Johannes Brahms composed his opus 40 trio for piano, violin, and horn in 1865 and
premiered the work in November of that year. Despite its unusual instrumentation, the Horn Trio
has since become a staple of the chamber music canon; it has also inspired a number of works for
this combination, including an example by György Ligeti that we will take up in the fourth
chapter. Brahms was evidently pleased with the work, and recommended it to his friend Albert
Dietrich for a chamber music evening on the composer-performer’s tours in 1865–66:

For a quartet evening, I can recommend my Horn Trio with a good
conscience, and your horn player would do me a very special favor
if he would do as the [player] in Carlsruhe [did], practice the
Waldhorn [natural horn] for a few weeks to be able to play it on
that…. In Oldenburg I’ll have the most splendid free time for
friendship and friendly music-making.¹

Several performances with Brahms at the piano have been documented in the work’s first
two years: Zürich on November 28th, 1865, with hornist Glass and violinist Hegar; in Carlsruhe
on December 7, 1865, with Segisser (first horn in Carlsruhe Opera; the referenced of the letter to
Dietrich); in December, 1865, with August Cordes (with whom Brahms had performed
Beethoven’s Op. 17 sonata and the piano quintets by Mozart and Beethoven in the 1850s); in
Oldenburg on January 10, 1866 with Westermann (the anticipated performance in the letter to

¹ Letter from Johannes Brahms to Albert Dietrich, Basle, 1865. Cited in Johannes Brahms: Life and Letters,
selected and annotated by Styra Avins, trans. Josef Eisinger and Styra Avins (Oxford: Oxford University Press,
1997), 335.

N.B. In modern German, the term Waldhorn refers to any orchestral horn, where Horn might refer to any
wind instrument (much like in American English). This seems to have been adopted before the turn of the twentieth
century: Henri Kling’s 1865 tutor is a Hornschule, where Oscar Franz’s 1897 tutor is a Waldhornschule that teaches
the valved orchestral horn. Brahms, however, always used the term Waldhorn in reference to the natural instrument
specifically; modern German hornists now use the term Naturhorn—which Brahms also used to mean the natural
Dietrich); in Strausbourg in 1867 with Steinbrügger; in Basel on March 26, 1867, with Hans Richter; and in Vienna on December 29, 1867 with Wilhelm Kleinecke. Notably, all of Brahms’s own performances (with perhaps one exception) occurred on the requested *Waldhorn*, the natural horn played with hand technique for which Haydn, Mozart, and Beethoven wrote, rather than on the *Ventilhorn*, the new valved horn that had come to replace the Waldhorn by the mid-nineteenth century.

Hornist Joshua Garrett emphasizes that Kleinecke’s appearance is particularly telling of Brahms’s insistence upon the instrument: Kleinecke was the second hornist at the Vienna Opera and also a natural hornist, where the more famous and esteemed first hornist Richard Lewy played only valved horn. Of course, any number of factors may have influenced the engagement of a given hornist, but Brahms would go to some effort to ensure that the title page for Simrock’s publication of the work specified Waldhorn, rather than the generic *Horn* that his orchestral scores indicate. Moreover, in a letter to the publisher (who was, incidentally, also a hornist) the composer indicated that he preferred the substitute cello—or later, viola—for the natural horn rather than use a valved horn.

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2 Cited in Joshua Garrett, “Brahms’ Horn Trio: Background and Analysis for Performers” (DMA diss., The Juilliard School, 1998), 27. Garrett also mentions that Brahms at least played through the work with Fritz Simrock, his horn-playing publisher, in 1866.

John Humphries notes that Richter had trained as a professional hornist in the Viennese Lewy line of virtuoso valved hornists, and therefore likely would have performed the work on a Viennese valved horn; yet the Lewys’ approach through mid-century, at least, would have advocated for a mixed valve and hand technique. John Humphries, *The Early Horn: A Practical Guide* (Cambridge: Cambridge University Press, 2000), 102.

3 Humphries (*The Early Horn, 99–103*) identifies that it was likely that within a few years of the premiere the Trio was performed on natural horn (Brahms’s numerous performances), rotary valved horn (Friedrich Gumpert with Clara Schumann in Leipzig, possibly with E-flat terminal crook), and Vienna valved horn in F (Hans Richter, who before becoming a noted conductor studied horn in Vienna where, to this day, they play a horn with different valve construction than elsewhere).


6 Cited in Avins, *Letters*, 335. There appear to have been two editions or “versions” of the Trio, with the first published in 1866 and the second published by Peters in 1891, though the differences between them are minimal. The original included a part for cello to substitute for the horn; in 1884, Brahms opted to also include a part for viola, and may have preferred it (Styra Avins, personal communication).
Why a horn at all? Alan Houtchens nicely summarizes the status of the instrument by the mid-nineteenth century: “The romantic instrument par excellence, [the horn] captured their imagination not only because of its rich, dark, mellifluous tone but also because specific associations had become attached to it: the hunt and, by extension, the forest and nature; the roebuck as a symbol of the cuckold; anything mysterious or exotic.” He also described that the horn was the instrument that “benefited the most” from nineteenth century technological

Note that many mixed chamber works that include horn will also include substitution parts for more common string instruments (usually cello) for marketability, including Schubert’s Auf dem Strom, Schumann’s Adagio and Allegro, and Beethoven’s Op. 81b Sextet for Two Horns and String Quartet.

improvements—namely, by the creation of the valved horn.8 “The valve era” had begun in the second decade of the nineteenth century, when following experiments from several instrument makers and hornists in the 1810s, Heinrich Stölzel and Friedrich Blühmel were granted the first patent for a valved brasswind instrument in 1818.9 The valve is cited—then as in now—as a modernizing, even revolutionary, intervention in brass instrument construction and a crucial moment in Western brasswind history since it “freed” the instruments from the “fetters of a single overtone series.”10 We have already observed how this is not exactly the case: through hand horn technique, the hornist had access to far more than a single harmonic series—it was rather the trumpet that was particularly limited to its single overtone series—but in orchestral settings both instruments were primarily used as a means of harmonic reinforcement on their open tones. Yet, as Barbara Lambert describes in the same volume, if “the history of brass orchestral instruments is the development of technology to make all types of brass instruments chromatic throughout their ranges,” even the most virtuosic uses of the hand horn would be found lacking.11

8 For more on the reception of valved brass instruments, see Cameron Ahrens, *Valved Brass: The History of an Invention*, trans. Steven Plank (Hillsdale, NY: Pendragon Press, 2008). Even in this reception history, Ahrens belies a valve-era doxa that takes the advantages of valve horn as obvious.

9 Anthony Baines, *Brass Instruments: Their History and Development* (New York: Dover Publications, 1993), 206–66. The first major work to call for valved horn specifically was Fromental Halévy’s *La Juive*, a widely popular opera, composed in 1835. Schumann’s Adagio and Allegro, Op. 70, and the *Konzertstück* for Four Horns, Op. 86, both written in 1849, are widely considered the first masterworks for valved horn.

10 Ibid. Arguably, it is the tuba that benefited the most: the serpent and ophecleide—earlier low tessitura labrophones that used hole-and-key systems—never found a permanent place in the orchestra, and the tuba simply would not exist without the valve.

11 Barbara Lambert, “Technical Development of Musical Instruments: Brass,” in *The Orchestra: Origins and Transformations*, ed. Joan Peyser (New York: Charles Scribner’s Sons, 1986), 155. Recall the many late Enlightenment masterworks for horn: Mozart and Haydn’s concerti and the chamber music of Mozart and Beethoven, and all of their symphonies. All of these were written for hand horn—what Brahms would call Waldhorn.
Thanks to the valve technology and technique that we will examine in this chapter, the horn is able to deploy its characteristic sound in full chromatic motion throughout its compass (which is also extended usefully downward) and thus able to transpose material or modulate instantaneously, to play almost any music. Thus, by many measures, the valved horn—the Ventilhorn, also called the chromatic horn—is less limited, more agile than Beethoven’s hand horns, and therefore an obvious advancement in instrumental technology. The valved horn was largely, if somewhat unevenly, adopted by about 1850, and it was certainly the standard horn in Austro-Germany by the time Brahms composed the Trio in 1865, regardless of the repertoire being performed.
This is why Brahms’s request for a “very special favor” is not merely obsequious: by this time, an Austro-German professional hornist would likely use the valve horn by default for any work written for *Horn*, and the older horn was little used, even for repertoire written before the invention of the valve. Indeed, following the Leipzig premiere of Trio in late 1866, Clara Schumann reported to Brahms that “the horn-player,” likely Friedrich Gumpert, the new principal of the orchestra, “was excellent. I do not think he spluttered once, and that says a great deal, though it is true that he played on a Ventilhorn as he would not be induced to try a Waldhorn.” If these two instruments—Waldhorn and Ventilhorn—are equivalent, or if the latter is an obvious improvement over the other, why might Brahms have insisted on the outmoded Waldhorn?

In this chapter, I examine the romantic imaginaries surrounding the horn in the nineteenth century, those that hear the horn—any horn—as a signal of nostalgia and loss calling from within the Trio. Continuing our focus on the drastic aspects of musical performance, but now upon two very materially-distinct horns, I examine the bodily technicities that contributed to the fabrication of these imaginaries. The Waldhorn, I argue, begs closer consideration within our ethics of instruments at the level of the mode of mediation (that is, whether we understand shifts in instrumental technology as active or passive, and upon what parameters) and a thus requires a

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14 Houtchens concludes that “Brahms apparently never felt comfortable with the valve horn, arguing… that it could not produce the same kinds of tone qualities peculiar to the hand horn with its various crooks” (“Challenge and Demand,” 176). This is closer to the point; however, his choice of words—“peculiar”—is telling and is the sort of discourse that will be examined in Chapter Four.
shift in our posture of attention that—beyond a general Romantic poetics or Brahms’s personal connection to or preferences for the instrument—would take into account the differences in sound between the Waldhorn and the Ventilhorn, if not their technologies.

I then turn to the valve and query its commonsense status as an obvious “improvement” upon the Waldhorn. As a technology of musical re-embodiment, it certainly affords new possibilities to the hornist—made possible by an otherwise unremarkable bodily discovery: the finger. We will observe how the work-concept shapes both our listening practices and shapes new musicking bodies through cross-instrumental territorialization. Reading against the grain, as it were, for the sonic effects of deploying the Ventilhorn in performance of the Trio, we see also that the valve is, in a very particular way, a technology of musical disembodiment, part of the material machinations that actually affords the transfiguration and transcendence the work-concept promises.

Along the way, I will also introduce several other instruments with material relations to the hornist, both obvious members of the instrumental taxa and other examples that reflect similar arrangements of materials, proposing wider maps of mediations and potential lines of flight. Where modern, positivist organology was founded with the aim of categorizing musical instruments into distinct taxonomic categories, a new critical organology exercises the utility of limit cases—seemingly strange or dead-end examples, of the technicities of concert hall and stagecraft and music criticism, the interplay between musical and scientific or technological instruments, as well as the organology of the body and of instrumental assemblages—to recompose our museum’s displays and reveal the edges of our ethics of instruments, our work concepts, and our musical aesthetics.\textsuperscript{15}

\textsuperscript{15} For example, see Emily I. Dolan, \textit{The Orchestral Revolution: Haydn and the Technologies of Timbre} (Cambridge: Cambridge University Press, 2013); Gundula Kreuer, \textit{Curtain, Gong, Steam: Wagnerian Technologies of...}
The Horns of the Romantic Imagination

Brahms’s first biographer, Max Kalbeck, attributed to the Trio a certain nostalgia and to the Waldhorn aspect specifically: Brahms had learned the instrument in his youth from his father, Jakob, who was an innkeeper as well as a musician who played the piano, violin, double bass, and the horn. This particular streak of sentimentality is, for Kalbeck and many later commentators, triggered by or at least strongly attached to the recent death of Brahms’s mother, Christiane, and grief over her death is understood to be poignantly expressed in the remarkable third movement Adagio mesto, a sorrowful lament laden with Romantic pathos. A few years later, Brahms would dedicate ten études for Waldhorn (op. post.) “to the memory of my father” following Jakob’s death in 1872.

More broadly, by this point in the nineteenth century, the horn and its characteristic gestures had become understood not only as an index of the hunt but as an “emblem of distance,” a topic associated with both idealized landscapes—geographical distance—and memory—as temporally dislocated past. Indeed, early reception of the Trio considers that the horn bears the


weight of poetic significance in the work: for one writer in the \textit{Neue Zeitschrift für Musik} in 1867, the “Romantic sonority of the horn” brought to mind the “woodland lyricism” \textit{(Waldeslyrik)} of the poets Eichendorff and Lenau.\footnote{“Correspondenz,” \textit{Neue Zeitschrift Für Musik}, January 4, 1867, 12. The translation of \textit{Waldeslyrik} is Reuben Phillips’s, with thanks to him for directing my attention to the review. See also Reuben Phillips, “Brahms as Reader” (Ph.D. diss., Princeton University, 2019).} In a broader study of the resonance of the Romantic horn call beyond the musical work, Rueben Phillips examines this literary and poetic horn that sounds in the pages of early nineteenth century writing. He identifies the “locus classicus” of the horn of memory in the 1798 novella \textit{Franz Sternbalds Wanderungen} by Eichendorff’s forebear Ludwig Tieck. Throughout the narrative, a memory of a horn call—heard when the titular Franz was some six years of age—haunts the protagonist. Phillips writes, “Tieck describes the recurring tones of the Waldhorn as though ringing through Franz’s consciousness—as ‘resonating inwardly’ or as ‘resounding in his being.’ Freed from an everyday function [of the hunt], this remembered horn call figures as a marker of romantic longing.”\footnote{Reuben Phillips, “On the Resonance of the Romantic Horn Call in Brahms’s Trio, Op. 40” (paper presented at the \textit{American Musicological Society Annual Meeting, San Antonio, TX, 4 November 2018}).} With a hermeneutic echo chamber, the symbolic horn in the Trio can be figured as both a marker of Romantic poetics and also specifically as the horn of Brahms’s own childhood; both symbolic horns become bound up with the two real horns under consideration: the Waldhorn and the Ventilhorn. These disparate but layering horns—ideated and imagistic, virtual and actual, past and present—all entwine in the chamber music space.

Let us examine, for a moment, a most traditional use of the hunting horn topic in the fourth movement of the Trio for its hornistic technicities. We might pose the question, following Cone: how does the final movement suggest a hornistic persona?

The horn as “emblem of distance” is a transformation from the hunting topic horn of the late Enlightenment taken up in the first chapter.
The finale of the Trio evokes the boisterous joy of the parforce (horseback) hunt, the sporting leisured practice of landed gentry that was read as chivalrous and noble through the Enlightenment, but by the Romantic had become emblematic of a kind of rambunctious freedom and the practice largely that of the bourgeoisie. The hunting horn—which could refer to a number of instruments of cylindrical or conical bore, and of narrow or wide compass—was used in these practices less as a musical instrument than as a mode of sonic signal that could carry over great distances to direct the movements of the hunt. In function, then, the hunting horn signal is similar to that of the military topic examined in the last chapter: it is the sound of

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communication across great physical distance, but this topic in particular weds the horn to romantic notions of the field, the chase, and simple joy.

The referent or signified here is the wide compassed and wide-looped metal hunting horn whose antecedent is the aristocratic French *trompe de chasse* (in D); here, the key of E-flat modulates this referent to the *Jagdhorn* descendent favored in Germany. Since in hunting practice they cannot employ hand technique—as one hand is used to hold the instrument to the mouth and the other occupied with the reins of the horse—these horns and their players (the signified) use only the open harmonic series, which makes the calls largely triadic or only lightly diatonic in the third octave. Besides registral difference, the military and pastoral are also topically differentiated by their meter: the gallop of the hunting horse organizes musical time, enforcing a compound meter.

Brahms’s hunting horns in the chamber space, however, must quickly move to a submediant that is not afforded by the traditional hunting instruments; that is, they must sound first partials of an E-flat length horn, followed immediately by a C length horn (see brackets in ex. 2.1, above). A Waldhornist will modify the pitch by adjusting the occlusion of the throat of the instrument, using the technique we observed in the last chapter (and included in the example) in order to afford the effect; a Ventilhornist will use valves. Because the horn’s—or, since the violin and horn are both agents of virtual hornistic personae, the horns’—melodic material is still based around open fourths and fifths, and continuing to bounce in the saddle of compound time (which the pianist underscores), the chamber musicking hornist can maintain the “impersonation” of the hunting hornist, and the horn in the chamber music space can become a

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22 Monelle refers to this uncanniness of the hunting horn mutating from E-flat to C in his discussion of the work (*The Musical Topic*, 96), and implies—though does not state outright—that this is a function of valve technology. This will be taken up again later.
hunting horn for the listener.\textsuperscript{23} The specific meaning of an actual hunting horn call—such as those directly quoted by the horns in Haydn’s Symphony No. 73 in D major, “La chasse” or in \textit{The Seasons}—may be less readily available to Romantic listeners than their earlier, courtly counterparts, but the message is clear: we are hearing exhilaration and freedom. The horns’ call came to embody the spatial distance between urban and rural landscape and the temporal distance between the industrial and preindustrial.\textsuperscript{24} In his examination of the horn as aesthesis, de Souza notes that as valved brass became more common, evocations of the natural horn—of this simple, pure joy—became a mode of nostalgia in and of itself.\textsuperscript{25} Through the nineteenth century, natural horn calls and evocations often became even simpler, such as in the call—written for valved horn but in wide intervals of older, natural instruments—that emerges from the mists at the opening of Bruckner’s “Romantic” Fourth Symphony.\textsuperscript{26}

\textbf{Virtual and Actual Horns}

This compound metered, harmonic series-based melody is sounded first by the violin (mm. 1–8), supported by the gallop of the pianist; thus, the “virtual agent’s” identity as a hornistic persona is merely confirmed by the actual musician-\textit{cum}-horn—a kind of timbral

\begin{footnotes}
\item[23] The notion of impersonation is from Edward T. Cone, \textit{The Composer’s Voice} (Berkeley: University of California Press, 1974), 5.
\item[24] Sylvan topical associations with the horn also speak not only to the personal, but as with all topics, to the more broadly social: the spatial distance between urban and rural landscape, and, for Romantic listeners, the temporal distance between the industrial and preindustrial. See Julian Horton, “Listening to Topics in the Nineteenth Century,” in \textit{The Oxford Handbook of Topic Theory}, ed. Danita Murka (New York: Oxford University Press, 2014), 643.
\item[26] Interestingly, Bruckner’s uses wider intervals more commonly associated with bugle calls than horn calls, sourced lower in the harmonic series. This demonstrates that, beyond mere evocations of the horn, even calls played on the horn became even more rigidly schematic as the nineteenth century continued (de Souza, \textit{Music at Hand}, 162).
\end{footnotes}
corroboration—rather than being wholly determined by it. Using similar devices, string quartets have long “hunted” without the presence of an actual hunting horn, and the piano can play at the posthorn in Schubert’s “Die Post” from the second Winterreise cycle. As these melodies pass through the ensemble, they can retain the sense of being a horn call without ever being actually sounded by one; through repetition and familiarity, it also becomes less of a signal than a musical theme, a generic musical object that begins to detach from topical specificity or timbral consistency.

Most commonly, however, we hear the topical horn in the distance emerging from a basic melodic-harmonic gesture known as a “horn fifth.”

Example 1.2. Archetypical horn fifth

The archetypical horn fifth is a melodic-harmonic gesture that uses only members of the harmonic series, and is thus afforded by any relatively long, wide-compassed horn—or, rather, two of them. In the most basic form of the gesture (ex. 2.2), the cor alto sounds partials 8, 9, and 10—the first three steps of a diatonic major scale—while the cor basso sounds partials 5, 6, and 8, presenting the major arpeggio afforded by the series in that octave (cf. ex. 1.12, m. 14). The two horns move in parallel motion, ascending, descending, or both through the partials in even

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27 The notion of timbral confirmation is from Dolan, The Orchestral Revolution. Recall that for Cone, what we attend to is the voice of the (instrumental) persona, the contours of its sounding, and not its material or means of sounding (The Composer’s Voice, 86). Thus a hornistic persona can emerge without need of an “actual” horn.

28 Such as the first movements of Haydn’s String Quartet Op. 1, no. 1, “La Chasse” (Hob. III:1) Mozart’s Quartet No. 17, nicknamed “The Hunt” (K. 458, part of the Op. 10 cycle dedicated to Haydn), and Brahms’s own String Quartet no. 3, op. 67. Interestingly, all of these quartets are in B-flat, lending a “flat-side” key quality without the quartet having to manage the three flats of E-flat major, the preferred key for the Jagerhorn and the solo Waldhorn. “Die Post” is in E-flat; actual post-horns are, at about 32 inches, pitched in G.

While quartets might begin with topical hunting movements, works for horn will invariably include them as the finale movement, such as with the Mozart’s concertos.
rhythm; the resulting harmonies outline (in the ascending form) first inversion tonic, dominant, and tonic. This example is notated in C major, as it would appear to the hornist regardless of the key of horn; the sounding result, of course, depends on the place-to-pitch mapping determined by the length of the tube.

As de Souza has noted in his sustained exploration of the gesture, this parallel motion into and out of the fifth would be forbidden by common practice voice leading rules, but seems to have been given license since it is, as we have learned, simply how horns move through pitch space.29 Moreover, this kind of “horn motion” is so regularly experienced as an “instrumental invariance”—that is, horns so frequently move this way, particularly at cadence points, in the Classical orchestral repertoire—that the gesture can create the perception of a horn even when one is not there.30 De Souza’s work in cognition and ecological listening presents evidence that a habituated listener does, in fact, paint a modicum of the horn’s timbre upon this gesture, even when no actual horn is sounding it—a phenomenon that de Souza refers to as “phantom horns.”31

The hunting, posthorn, and horn fifths topoi are all related in the “universe of topics” by turning upon the sounding affordances of the hunting horn, and even when written for strings or piano, many versions of these topicalized gestures could also be sounded, more or less, by natural horns of the right length.32 Any instrument—or any two instruments—that has the affordances to play

31 de Souza, _Music at Hand_, 159–69.
32 The “universe of topics” was compiled by William E. Caplin, “On the Relation of Musical Topoi to Formal Function,” _Eighteenth-Century Music_ 2, no. 1 (March 2005): 113–124. While a great number of topics are delimited by timbre (the trumpets and drums of the march, the brass fanfare, the clanging idiophones of the Turkish “janissary” band, the _aulos_-like woodwinds of the pastoral) or defined by instrumental affordances and parameters (the triads of said fanfares, the sighing _piantos_, the _coup d’archet_), few topics are so clearly and simply labeled by a given instrument and its affordances as the horn fifth.
upon the pitches of the harmonic series, then, can move like and, to some extent sound like, horns.

The opening of Schubert’s “Der Lindenbaum” is a paradigmatic example (ex. 2.3): following the pianist’s pictorial depiction of rustling leaves through the use of quick triplet-based gestures (such as heard in m. 6, provided), they assume, for a moment, a hornistic persona: a horn calls from the distance through a brief fanfarish gesture (m. 2, not provided). Following another stirring of the wind, we hear a pair of horns, courtesy of a variant the familiar horn fifth (mm. 7–8), that recede into the distance through Schubert’s notated dynamic contrast.

Example 1.3. Schubert, “Der Lindenbaum,” from Winterreise, D 911, mm. 6–13

At the start of Müller’s text, Schubert expands the hornistic personae to a quartet. The accompaniment could almost be sounded by a quartet of hunting horns in E; however, the voicing for the descent at the end of measure 12 would require technological intervention to
sound the lower F-sharp and G-sharp, which are not present in the harmonic series in that octave. Nonetheless, the pianist has become a horn quartet for the listener, and the voice doubles the first “horn” and lightly decorates the line. Rosen notes that the titular Linden tree functions as a “traditional sign for absence” that is doubly removed by not being seen by the traveler-narrator. The horn quartet heard here is also heard as if from a distance: while horns are always heard from a distance, “over there,” we may also interpret the horns—though they are not actual horns—as being heard from “back then,” temporally removed, and thus haunting the traveler in the same manner as those heard by Tieck’s Franz. The horn fifth motion in the piano creates the sonorous presence of horns in the present as an evocation of the past: memory.

We begin to observe how the transfer of topic across instruments participates in the regulative work-concept’s notion of separability: the topic can evoke the horn—or its meaning—when the horn is not even there by trading on a kind of sonic essence that supplements the merely material, and thus musical meaning (the gnostic) can be emancipated from the conditions of its production (the drastic). To take a yet more famous example (ex. 2.4) from this corner of the universe of topics: at the opening of Beethoven’s Piano Sonata Op. 81a, called “Les Adieux,” the right hand of the pianist sounds a descending horn fifth in E-flat major; over this phantasmic

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33 We could also imagine that the hornists are playing two different hunting horns in E: one at 390cm and an entirely fictitious 780cm example, an octave lower. Such a E basso horn, however, would be significantly longer than even the lowest tubas and contrabass trombones and therefore hardly practical.

34 This reading is even further nuanced if we recall that Müller’s book of poems, from which Schubert assembled the Winterreise, was published under the title Sieben und siebzig Gedichte aus den hinterlassenen Papieren eines reisenden Waldhornisten (Seventy-Seven Poems from the Posthumous Papers of a Travelling Horn-Player), implying that the narrator may have himself been a hornist. (Incidentally, Müller’s collection was dedicated to Carl Maria von Weber, who wrote some of the last masterworks for solo and orchestral hand horn and who was godfather to the poet’s son F. Max Müller.) The full collection of poems (and thus likely the title) was not known to Schubert when he set the first twelve songs of Winterreise.


On the final syllable of this farewell, the left hand of the pianist sounds C octaves; where an archetypal horn fifth would sound a major sixth, implying the first inversion major triad in E-flat, Beethoven’s phantom horns here sound a disarming C minor root position triad.

Example 1.4. Beethoven, Sonata No. 26 in E-flat major, op. 81a, “Les Adieux,” mm. 1–2

This moment of uncanniness is due, as many analysts note, to the subversion of the expected major; from the hornists’ perspective, the moment is marked because the E-flat length horn—implied by the open horn fifth—cannot sound C in these registers. (To a lesser extent, this is also at issue in Brahms’s more rollicking hunting horn passage, above, ex. 2.1.) A composer scoring this for actual horns would have several options. A quartet of natural horns in C would be able to sound this gesture, but the hand technique required to manufacture the E-flat, F, and B-flat (or the first two measures of Brahms’s fourth movement melody almost entirely) undermines the clarity of the horn fifth gesture and, for a habituated listener, implies the C tonic before it is ever sounded. The more likely solution in the would have been to score for a pair of horns in E-flat and a pair of horns in C; this mixing of the tonic and flat mediant keys is how horns are crooked in many minor key symphonies, including in Beethoven’s Fifth Symphony in C minor, op. 55, or in the second movement of the Eroica. This mixing of lengths affords, like the piano, a wide-

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37 Incidentally, Beethoven’s Op. 81b is the Sextet for Two Horns and String Quartet in E-flat major, written around 1795 but not published until 1810, the same year as “Les Adieux.”
open sound on the tonic triad, reinforcing its foundational status—much as Beethoven called for
the changing of the crook for the first horn in the first movement *Eroica.*

The texts of these two examples—which we will examine in more detail later—confirm
the horn’s role as a sonic technology for the representation of nostalgic memory, aurally
signified by way of the horn fifth. Technologically, through the *shared* affordances of horn,
violin, and piano, we can hear phantom horns haunting the beginning of Beethoven’s piano
sonata intoning *Lebewohl* or calling from the distance across time and space in Schubert’s song.

This is also how the violinist can make an excellent *cor basso* in Brahms’s expansion of
the figure in the Trio’s third movement, shown in example 2.5 with partials notated for the
hornist and implied ones for the violinist marked with Arabic numerals.

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38 After the first few decades of the nineteenth century, this gesture would also have been experienced in equal
temperament at the piano; by contrast, orchestral hornists would have and continue to execute the figure in just
intonation. These ramifications will be explored in the final chapter.
Example 1.5. Brahms, Horn Trio, III. Adagio mesto, mm. 59–65 (executed on Waldhorn)

Brahms uses this gesture to good effect here: situated within the dark E-flat minor of this *Adagio mesto*, these E-flat major horn fifths feel suspended, a moment from another time. The fifth is heard again not only at a softer dynamic, as in Schubert’s fifths, but also at a harmonic remove: sounded again in F major, Brahms’s horns become even more distanced and hazy, almost a memory. The phantom horns mingle with the timbre of an *actual* horn—which as Monelle notes always carries a whiff of the topical—creating a deep abyss in which virtual and actual horns, horns present and horns remembered, intertwine.

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39 For another reading of this passage, see Beller-McKenna, “Distance and Disembodiment,” 84.
30 Monelle, *The Musical Topic*, 93: “The whole panoply of the Dampierre [long compassed] horn call, with its meter, its timbre, and its character, may be present; but the hunt topic is also regularly evoked by means of simple triadic tunes, or merely by the timbre of the horn.” As Dolan identifies, by the end of the Enlightenment the timbres of orchestral wind instruments had become bound up with poetic significance while strings remained the neutral sound of “music” (*Orchestral Revolution*, 167–8).
Interestingly—though perhaps not surprisingly—several analysts have attempted to attach folk songs to either the theme of the finale or to this moment of horn fifths in the *Mesto*, which is understood to foreshadow the theme of the last movement. The suggested songs have been understood to have been taught to Brahms by his mother (in Kalbeck’s reference to “Dort in den Weiden Steht ein Haus”), or else to represent love lost (in Hill’s source “Es soll sich ja kienen mit der Liebe abgeben,” referring to the end of Brahms’s relationship with Agathe von Siebold), and thus add further texted and personal layers of memorialization to the work.\(^{41}\) These attempts to locate vocal, texted music here often fail to acknowledge the basic horn fifth underneath, favoring textual and hermeneutic modes of engagement over the technological and the immediate—or as in Abbate’s formulation, the “gnostic” over the “drastic.” Susan Sontag writes that often “interpretation takes the sensory experience of the work of art for granted, and proceeds from there,” bracketing off manifest content at the surface to get at “the latent content underneath,” the hidden meaning or the figure in the carpet.\(^{42}\)

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While Brahms may have been making reference to a known folk song, it is may also be simple coincidence: he is not referencing the simplicity of folk music, but rather working within the limits of the horn’s affordances. There are also at least several examples of folk melodies based on the familiarity and normalization of the horn’s affordances, often a function of directly troping horn calls (such as in the sung practices of the *trompe de chasse* tradition). Thus the voice can, too, become a horn (or at least a hornistic persona); inversely, the horn can become a voice saying “Lebewohl.”

As to the relationship between the fifths in the *Mesto* and the finale’s theme—or that the folk song functions as a kind of *idée fixe*—while foreshadowing or cyclicism may have been intentional, I cannot help but feel it may have also been circumstantial, a simple parallelism based merely in the affordances of the Waldhorn. This will-to-intentionality is explicit in the reception of Ligeti’s Trio and its use of the horn fifth, explored in the fourth chapter.

\(^{42}\) Susan Sontag, “Against Interpretation,” in *Against Interpretation and Other Essays* (New York: Picador, 2001), 13, 7.
Brahms himself provided a decidedly *pragmatic* answer to the Waldhorn question in a letter to Max Brode, violinist in Konigsburg who wrote to the composer about, it seems, the possibility of performing the work on valved horn.

Dear sir,

I [would] thank your horn player very much if he would try to play [bläsen] on the natural horn [Naturhorn, another term for a valveless horn] and I would be grateful if you all left it at that. I have often performed this work with Waldhorn to my and others’ pleasure, namely with Mr. Steinbrügger in Strasbourg and Mr. Seigisser in Karlsruhe.

But I would be afraid to hear it with the Ventilhorn. If the hornist [Bläser] is not obliged by the stopped notes to play softly, the piano and violin are not obliged to listen to him. All poetry is lost and the tone is rough and unpleasant from the beginning. The first sixteen bars should immediately convince and clearly show how to handle the whole piece. The ensemble, however, requires some effort and indulgence and caution from the two colleagues.43

As we will see, until the mid-nineteenth century the instruments Ventilhorn and Waldhorn were not considered interchangeable, but rather presented very different technologies and techniques with ramifications upon dynamic, balance, and timbre especially salient in the close chamber musicking space of the Trio.44

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Bessaraboff points out that “it should be taken into consideration that the piano of Brahms’ period was not so loud as the modern instrument. Even then the pianist and violinist had to subdue themselves so as not to overpower the hornist. This gives an idea of the softness of the hand-horn tone and suggests a proper dynamic level for performing Brahms’ Horn Trio.” (Nicholas Bessaraboff, Ancient European Musical Instruments: An Organological Study of the Musical Instruments in the Leslie Lindsey Mason Collection at the Museum of Fine Arts, Boston, [Cambridge, MA: Harvard University Press, 1941], 144.) Organologist, historian, and hornist Jeremy Montagu confirms this experience on the hand horn, and I have experienced pedagogical performances of the work with natural horn, modern violin, and modern piano; the hornist indeed has difficulty approaching the volume of the loud modern piano.

By taking Brahms’s letter at face value, I suggest that rather than the Romantic poetic horn of distance or of childhood, we attend to the Waldhorn and the Ventilhorn present before our very ears. Brahms’s attention to the material differences between these two instruments in performance submits that we attend to poietics and praxis—that is, the production or making of things and the doing of music. What I am suggesting is that we take Brahms at his word and reconsider the “fringe of contact” (to borrow from Roland Barthes) between instrumentality and significance—here to the difference between the two not in symbolism, but in technology and technique, collectively technicities.\(^{45}\) In Sontag’s argument, “Our task is not to find the maximum amount of content in a work of art,” but rather, “to cut back content so that we can see the thing at all.”\(^{46}\) In this shift, we may attend to how the making of sound and music might be significant in its own right.

To be clear, I am not advocating for a primacy or authenticity of historical performance practice in the performance of this work; rather, this is a call for music studies to remember instrumental technicity whether in the most absolute or hermeneutically-tempting works. Circling between various passages in the work, I will focus upon the differences in technicities between these older and newer instruments that co-existed in the nineteenth century, and consider the some of the larger implications of this shift and translation as it realizes other, no less salient priorities of the Romantic era under the auspices of the work-concept.

\(^{45}\) Roland Barthes, “The Grain of the Voice,” in The Responsibility of Forms: Critical Essays on Music, Art, and Representation, trans. Richard Howard (Berkeley: University of California Press, 1991), 269. “The ‘grain’ of the voice is not—or not only—its timbre; the signifying it affords cannot be better defined than by the friction between music and something else, which is the language (and not the message at all).”

The Bodily Technics of the Waldhorn

As we already know, the horn or trumpet—or any aerophone of class 423—begins with a simple tube containing a standing column of air set into motion by the vibration of the player’s lips, and any lip-activated aerophone of adequate length can easily sound above the eighth partial of the harmonic series. By the mid-eighteenth century, Bohemian orchestral hornists had discovered that by inserting a cotton or wooden plug into the bell of the hunting horn—the long horn they had inherited from the hunting trompeurs of Versailles—they could create tones between the partials of the harmonic series offered by the horn’s tube and quiet the historically brash instrument.47 This discovery is popularly attributed Dresden court hornist Anton Joseph Hampel, thanks to the efforts of his students Giovanni Punto and his student Heinrich Domnich.48 In his 1808 tutor, Domnich describes: “In a flash of inspiration [Hampel] realized that by alternately inserting and withdrawing the plug he could cover without a break every diatonic and chromatic scale…. Soon afterwards, finding that the plug could be replaced advantageously by his hand alone, he discarded the plug altogether.”49 While the original technique may have been devised through the introduction of a foreign object to plug the instrument, in the case of the horn, the muting modifier could be replaced by a technology

47 Reginald Moreley-Pegge, The French Horn: Some Notes on the Evolution of the Instrument and Its Technique, Instruments of the Orchestra (London: Ernest Benn Limited, 1960), 86–89. Moreley-Pegge notes that pitch-raising mutes had been used on the trumpet since the first half of the seventeenth century, so the general principle was likely known to Hampel (Ibid., 88).
48 Moreley-Pegge also notes that the technique may have been “discovered” by Strasbourg-born hornist Jean-Joseph Rodolphe; he is at least responsible, it is agreed, for its popularization in France (Ibid. 149–51). Though he was employed as a violinist in the Paris Opéra, he was also a celebrated horn soloist. The Mercure de France, writing of a performance in the later 1760s, wrote: “On ne craint pas de dire que jusqu’à ce qu’on l’eût entendu, on ne croyait pas possible de rendre sur cet instrument [the horn], comme le fait M. Rodolphe, toute les difficultés d’une musique savant, les intonations les plus difficiles avec le son le plus flatteur et les cadences de la plus belle voix” (cited in Moreley-Pegge, The French Horn, 173).
49 Heinrich Domnich, Méthode de Premiere Cor et de Seconde Cor (Paris: Le Roy, Conservatoire Imperiale de Musique, 1808), iv, trans. in Moreley-Pegge, The French Horn, 88.
already present: the player’s hand. The technique of the hand is referred to as “stopping,” and the
technique to which Brahms refers, and that we have already observed at work in Beethoven.⁵⁰

Let us look a bit more closely at these instrumental and bodily technics that come
together in the hand horn—what Domnich esteems as “a new kind of instrument” in the history
of the horn.⁵¹ When horn players place their cupped hand inside the bell flare with fingers
extended against the throat of the horn (as in fig. 2.3, e), they add length to the standing air
column of the instrument and thus somewhat lower the frequency of the fundamental.⁵² This
neutral position of the hand in the bell would become standard for all orchestral horn playing.

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⁵⁰ The German gestopft refers specifically to hand-stopping, where the gedämpft refers to muting more generally. For the latter, modern hornists will use a (straight) mute rather than their hand; for the former, either their hand or a specially designed “stop mute” that replicates its effects.

⁵¹ Domnich, Méthode, v.

⁵² The acoustics of phenomenon has been confirmed by acoustician and hornist Robert W. Pyle, Jr. (personal communication). For more on acoustics, organology, and technique of Western orchestral instruments, see Murray Campbell, Clive A. Greated, and Arnold Myers, Musical Instruments: History, Technology, and Performance of Instruments of Western Music (Oxford: Oxford University Press, 2004), esp. 153–4.
By further cupping the hand in the bell—bringing the heel of the palm closer to the opposite wall of the throat (fig. 2.3, f)—the player adds yet further length to the air column by effectively extending the throat of the instrument. The horn can then access another harmonic series a half-step lower than the so-called “open” horn, with the hand in neutral position (fig. 2.3, e) providing chromaticism in the already diatonic upper register and leading tones in the middle and lower registers. If the player further occludes the throat of the instrument, the tube can be yet further lengthened, and will actually reach down to a half step above the next partial of the harmonic series, and can thus effectively fill in the remaining gaps in the harmonic series in the middle.

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53 Franz Joseph Fröhlich, *Horn-Schule* (Bonn: N. Simrock, 1811), 7. Note that Fröhlich also includes mouthpieces proper to the two “types” (*Arten*) of horn: *primarius* (a) and *secundarius* (b) (Ibid., 6).

54 As my teacher Randy Gardner described, the movements of the hand in the bell be likened to that of a door swinging shut: note that in the image above, the hornist’s fingers in the bell remain in the same location, while the heel of the hand only approaches the opposite side of the bell throat (c.f. Fig 2.3 [e] and [f]). When modern hornists refer to “stopped” horn, they are referencing an extreme version of this technique, discussed below.
register. In sum, the Waldhornist could thus play not only the harmonic series afforded by the instrument’s tube (“the fetters of the harmonic series” Houtchens cites), but could also sound diatonically and even chromatically in the middle and upper registers by using different gradations of stopping to create, factitiously, various lengths of tubing—that is, by instrumentalizing the hand as a new part of the horn. Moreover, because of the particular lengths of tubing the hand affords to make (facere) these pitches, the horn works well with this fleshy extender and is adapted to take advantage of this technicity—it is at the same time technique and technology—through the second half of the eighteenth century by coiling more tightly in front of the player and widening at the throat and flare to more readily accept the hand.

Note to hornists: As is long borne out in the pages of *The Horn Call* and in horn players’ forums on the internet, the acoustic effect of fully stopping the horn is a matter of long debate: is the horn continually lengthened, or does it actually cut off and become shorter as the hornist completely occludes the throat of the instrument? Robert W. Pyle demonstrated in a paper that both explanations have grounding (Robert W. Pyle, “Pitch Change of the Stopped French Horn,” *The Journal of the Acoustical Society of America* 36 [1964]: 1025). In either case, the effect is that a more or less fully closed note sounds one semitone higher than might be expected. Experientially, many hornists will attest to the latter, that the horn gets shorter; indeed, I still prefer this explanation in casual conversation with non-hornists. However, Campbell, Greated, and Myers mention that “recent acoustic experiments” (ca. 2000, though they do not cite them) have shown that the breaking point is not in the length of the tube—the column of air continually lengthens even as the bell is fully occluded—but rather that the pitch lowers so much that it sits one semitone above the next lowest partial on the open horn. “Thus if the bell closure is accompanied by a slight increase in lip tension and breath pressure, the lip vibration will not follow the original mode [partial] downwards, but will jump to the next highest mode [partial]. The stopped note will therefore sound a semitone higher than the original unstopped note” (*History, Technology, and Performance*, 153). The authors do not mention here the characteristic change in timbre that accompanies the shift between stopped and unstopped pitches, since its original purpose was to change notes, not necessarily to change timbre.

Campbell, Greated, and Myers note that the discovery of hand technicity was facilitated by the already present coiling of the hunting horn and the right angle of the axis of the mouthpiece and of the bell. Because of the particular “lengths of tubing” the hand can afford (among other factors), the use of hand technique is only effective for narrow bore, wide-belled instruments with nominal pitch a fifth around 12-foot F. This explains, at least in part, the general preference for horn solo work for horns with nominal pitch between D and G, or the standard crooks available for the *Inventionshorn*—which was developed in collaboration with Hampel—or *cor solo* and the prevalence of those keys in the repertoire. Additionally, it explains why hand-stopping did not catch on with the shorter but wider bugle, though it was attempted. See Campbell, Greated, and Myers, *History, Technology, and Performance*, 162–3, 167, 181.
On its surface, a Waldhorn “itself”—that which can be hung in a museum and passed from player to player—appears as a natural instrument without mechanism to alter its length. In Hornbostel-Sachs taxonomy, it is thus separated from the later Ventilhorn at the first level of bifurcation: “natural” lip-vibrated instruments without instantaneous length altering mechanisms are all classified as 423.1 (aerophones; blown at one end; activated by the player’s lips; “without extra devices to alter pitch”—crooked horns are included here); those “with extra devices to modify pitch” instantaneously are classified at 423.2. Hand technique, however, is a quite effective method of making the instrument chromatic and plays a crucial role in defining the instrument’s affordances. The chromatic category includes fingerholes (such as on the cornetto), slides (trombone), and valves; however, there is no mention of the Waldhornist’s hand (nor the external mute technology by which it was discovered), neither in Hornbostel-Sachs nor in major subsequent revisions by the Museum of Musical Instruments Online (a consortium of European museums) or Roderic C. Knight. Though the lips that define 423 instruments have, in a sense, been recovered for labeling in these later systems as labrosones, labrophones, or plain “lip
reeds” (analogous to the clarinet or oboe’s mechanical reed), it appears that the *technique* of the hand has been separated from the *technology* of the instrument. Consequently, the hand remains lost to the categorizing gaze of positivist organology.

Western instrumentality often understands that instruments extend the capabilities of the body beyond its bounds: a telescope allows us to see farther, a stethoscope to hear what might otherwise be inaudible. Of *musical* instruments, we typically understand the instrument as an extension of the musical body. Recall David Burrows’s description from the introduction: “The instrumentalist rejects the resources of the interior of his body used by a singer in favor of an interaction with an object outside himself.”

For example, in her examination of Western orchestral brasswind, Lambert (“Brasswind”) notes that the attempt to make brass instruments chromatic uses three technologies—hole (and later hole and key) systems, slides, and valves—and one technique, hand horn technique. From the perspective of technics, there is less distinction between technology and technique; from a wider, new organological perspective that understands that the body can be organized (in the strong sense) as metal or reed, hand “technique” is another chromatic technology, of a fleshy kind. I have not been able to locate a classification for the hand horn in any extant classification systems, though it does refer not only to the technique but also for horns designed to work with it.

To this end, I might tentatively propose an addition to the instrumental classification schematic 423.2 (chromatic labrosones). In the MIMO revision (20), “423.22 Slide trumpets,” such as the European trombone, are used to classify instruments in which “the tube can be lengthened by extending a telescopic section of the instrument whilst it is played.” The hand horn could be classified as a slide labroson whose tube is lengthened at the end, but if and only if the player’s hand is recognized as part of the instrument, as a *device* which makes the composite instrument chromatic. Thus the “slide trumpet” category 423.22 could be subdivided into (423.22.1) those which telescope the instrument’s tubing within the instrument’s corpus or (423.22.2) at its end. The benefit of subdividing the category thus also points to the instruments’ shared *portamento* affordances between discrete pitches, which are not a function of the player’s “lipping” but of the relatively infinite gradations of length of the instrument’s corpus.

Alternatively, an additional category for hand horn, its experimental predecessor the plug-stopped horn, and the less successful hand-stopped bugle could be identified: 423.24 “Labrosones made chromatic by use of external object in the bell.” Myers (personal communication) indicates it would be a bit difficult to assign instruments to this category, since it is difficult to tell from the visual form of the instrument if it was built to be used in this manner.

For more on the evacuation of the body from organology and musicology, see Peter Szendy, *Phantom Limbs: On Musical Bodies*, trans. Will Bishop (New York: Fordham University Press, 2016). Specifically here, he critiques Mahillion (which served as a basis for Hornbostel-Sachs) and Sachs for denying “autophony” to instruments with the lexical gloss to “idiophone,” thus denying the instruments (or instruments’) agency and keeping them bound to the human (Ibid., 87–91). I have elsewhere argued that the H-S label for 423 instruments, “horns and trumpets,” performs a similar movement upon the organized human body: the making a wholly separable artefact from its execucant’s instrumentalized lip-reeds, in the same manner as music became artefactual under the work-concept, and the taxonomy does not account for the human voice (M. Elizabeth Fleming, “Partial Perspectives,” *Sonic Circulations Research Blog* [blog], June 2018, https://soniccirculations.com/).

For example, in her examination of Western orchestral brasswind, Lambert (“Brasswind”) notes that the attempt to make brass instruments chromatic uses three technologies—hole (and later hole and key) systems, slides, and valves—and one technique, hand horn technique. From the perspective of technics, there is less distinction between technology and technique; from a wider, new organological perspective that understands that the body can be organized (in the strong sense) as metal or reed, hand “technique” is another chromatic technology, of a fleshy kind. I have not been able to locate a classification for the hand horn in any extant classification systems, though it does refer not only to the technique but also for horns designed to work with it.

his own two hands where he can work on it and shape it out in the open, in full view of anyone who cares to watch.” For the Waldhornist, this shaping is done by private movements inside the bell, and we become aware that the condition of being musical (inasmuch as being musical was equated with being melodic, or at the very least producing characteristic sound) can only be the result of the hand working in tandem with the instrument—extending the instrument’s capabilities, as well.

And despite the standardization of the valve, which makes such movements of the hand to create melody unnecessary, hornists still play with their hand in the bell in the neutral position. Modern hornists use smaller, finer gradations of hand movement to subtly adjust intonation. Moreover, all horns built to be played with the hand in the bell—from the Waldhorn to the modern instrument—are actually built short in anticipation of this fleshy tube extender; thus even the modern valved instrument is also incomplete without the hand of the executant.\(^{62}\) The orchestral horn is not simply a material artifact which has been designed to receive the hand: it is one which \textit{calls for} a hand to be complete for its sounding.

Crucially here, whether at work to shape melodies in the Waldhorn or just by its mere presence in the neutral cupped position in the Ventilhorn, the instrumentalized hornist’s hand changes the very sound of the horn into the characteristic timbre that we have come to associate with it, its “rich, dark, mellifluous tone.” The sonic parameter of \textit{timbre} is the result of simultaneous sounding and synthesized hearing of several pitches at once: the harmonic series—the organized though irregular pitch space upon which lip-vibrated aerophones operate melodically—is also present in the tone of any pitched instrument. An instrument’s characteristic

\(^{62}\) From this perspective, the player’s hand serves as a crook (length extension) at the end of the instrument.
timbre is the result of the proportions and balance of harmonics present and heard in the sound. For example, a clarinetist’s particular sound is a function of the way the single mechanical reed pulses air inside the fairly cylindrical tube, which gives rise to a sound that is dominated by the presence of the odd numbered harmonics.\textsuperscript{63} A hornist’s sound, by contrast, is richly saturated throughout the spectrum due to its generally conical tubing, with a strong fundamental and relatively balanced, though gradually diminishing, presence of higher harmonics. A wide-flaring bell aids in the radiation of the hornist’s sound, rather than reflecting the sound back up into the instrument, as is the case with earlier, animal-derived examples. With the hand in the bell, however, more high-frequency harmonics are reflected back upon the player, which helps to establish stronger standing waves in the instrument’s tube.\textsuperscript{64} For the listener, the effect is filtering out some of the higher frequencies in the sound, resulting in a tone that is less brilliant, that is, “dark.”\textsuperscript{65} The sharply flaring bells of the trumpet or trombone, without presence of a hand, lend to the comparative “brightness” of sound.

The hand horn does not act merely in front of the player, prosthetically—where prosthesis is literally “to set before.” In the case of the hand horn and related instruments, it is difficult to talk about “the instrument itself” (in Sachs’s words) because the hand is, like the lips, part of the technology of the instrument, inasmuch as a musical instrument is valued not only for its ability to make any sound, but to make musical sound, a characterological voice.

\textsuperscript{63} See Campbell, Greated, and Myers, History, Technology, and Performance, 52–3.
\textsuperscript{64} Because these standing waves within the instrument are stronger, this can reinforce desirable frequencies (through “peak definition”) back at the player, creating better conditions for efficiency and accuracy as the harmonic series narrows; this is why good hand position aids the production of higher notes in particular. See Adam Watts, “Spectral Analysis of the French Horn and the Hand-in-Bell Effect” (Senior thesis, University of Illinois, 2009).
\textsuperscript{65} Campbell, Greated, and Myers, History, Technology, and Performance, 153–4. They also note that the hand, by its very presence in the bell, secures the intonation of some higher pitches by the same principle.
Within the framework of Dolan and Tresch’s ethics of instruments, the players hand is not only part of the map of mediations that influence or modify the instrument, but also becomes part of the material of the instrument, and one that we come to take for granted in our insistence upon durable artifacts and technologies of the instrument itself. From the perspective of material configuration and the production of musical sound, the Waldhorn does not begin nor end at the “instrument itself,” but includes the lips and the hand of the executant. We must, instead, consider the *Waldhornist*, an instrument-player choreography with the technics of lip reeds and tubes made of both metal and flesh.

**Hearing the Body in Brahms’s Melodies**

As we have observed in the Beethoven symphony (ex. 1.6, 1.18), the hand hornist’s scales and chromatics exhibit colors and dynamics beyond what is attributed to basic characteristic timbre. Because of its idiomatic dependency upon the harmonic series, Waldhorn melody consists of hand-hewn inflections (called “factitious notes” in the tutors of the early nineteenth century) upon the series of the tube alone (“natural” notes) that are less an interpretive choice than functionally wedded to the instrument’s particular—some might say peculiar—way of bringing the body of the instrument and of the player together. We have and will continue to observe that these idiomatics are audible in the work of the Waldhornist even if we do not see this labor in performance, obscured by the bell, and generally illegible in the score.

In the last few decades, musicology has sought to recover and describe the actions of the body in performance as a valuable epistemology of music. Perhaps most famously, Elizabeth Le Guin explored her embodied, “carnal” relationship with cellist Boccherini, reading her body’s

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66 While the term “factitious” carries the valence of “artificiality” or “contrivance,” its etymological root remains *facere*, “to make,” which is also the root of “fact.”
hand and bow positions and sensations of tension and release in his sonatas for solo cello. More recently, Tom Beghin has recovered the rhetorics of Haydn at the keyboard, including not only musical figuration but also visual elements of performatic delivery, including arm crossings, facial expressions, and body position. These readings are a way of making the body sensible—even legible—in performance, a way of shaping our hearing by reading the haptic rhetorics of the body. Where musical instrumentality is often figured toward expression, pressing outward, these analyses draw the reader and listener inward into the intimate spaces of corps à corps, Szendy’s body-to-body contact.

Let us return to Brahms’s Trio and examine the actions of the hornist’s hand—actions with which (rarely enough in the horn repertoire) the composer may have been intimately familiar. Rather than feeling for Brahms’s personal comfort or discomfort or gazing upon his visual demeanor, however, one can easily hear the labor of the Waldhornist in action. The first movement’s “walking theme,” introduced by the violinist and repeated by the hornist in mm. 8–16 (ex. 2.6, below), presents an excellent illustration of how melody and timbre, music and body, are wedded together—not only haptically but also audibly—by the Waldhorn. Moreover, in his

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68 Beghin, *The Virtual Haydn*.
69 Among the many curiosities of the work is that the first movement is not, by most measures, a sonata-allegro movement—a feature unfailingly remarked upon by every commentator upon the work. The hand horn’s oblique relationship to sonata form was discussed in the first chapter; it should be no surprise to the reader that the lack of obvious sonata form in the work overall is often read as a function of the hand horn’s “restrictions,” though Garrett argues that there is a hidden or modified sonata form in the second and fourth movements (“Brahms’ Horn Trio,” esp. 33).

The Andante tempo of the first movement, however, may be attributed to another aspect of Brahms’s compositional practice: his predilection for long walks. He described to Dietrich that he conceived of this first movement theme while on a walk in the woods near Baden-Baden, the summer escape where he began work on the Trio (in Florence May, *The Life of Johannes Brahms*, vol. 2 [London: E. Arnold, 1905], 39.) This theme, then, is often described as a “walking theme,” and so itself a kind of creative aestheticization of human motion and gesture.
letter to Brode, Brahms cites these first bars for being the exact illustration of why he preferred, or that the work demanded, the Waldhorn.

As with the majority of our Beethoven movement, Brahms’s Trio calls for a Waldhorn in E-flat; unlike Beethoven, Brahms never has the hornist change the crook, and thus the nominal pitch, of the instrument throughout the entirety of the work. Brahms’s hornist works primarily in the cor alto register; however, there are several difficult, though slower, passages in the cor basso register in the fourth movement. The compasses provided in the last chapter as examples 1.10 and 1.11 reflect, more or less, the compass of Brahms’s Waldhorn. Also as before, I present the horn part in “horn pitch”; this allows us to read—as the hornist does—a kind of tablature for partials (indicated with Arabic numerals) and the degree of the hand’s occlusion of the throat of the instrument (additional markings) to produce the notated pitch. Of course, these markings would not appear in the part, and they are more prescriptive than traditional fingerings: the natural horn does not afford another way—or, in the sense of techné, the hand hornist simply “knows” no other way—to produce the sounding result.

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70 The consistency of crook creates particular colorings of certain key areas in the work—colorings which Beethoven avoided, in effect, by changing the first horn to F in the recapitulation or by dropping the horns out of the orchestration in certain passages. In the case of Brahms and within the chamber music space, this creates desirable and effective shifts of timbre that, because of the harmonic series’ relationship to tonality (or at least the tonic and dominant) and highlight departure from E-flat. Garrett (“Brahms’ Horn Trio”) argues that, in this way, the work becomes “about” E-flat; to this end, he charts the percentage of factitious notes in each movement and within each section. This resulting coloring not merely of melodies but of key areas is particularly salient in, for example, the Trio of the Scherzo movement, which is in B major, the enharmonically flattened submediant of E-flat.

71 As mentioned previously, different tutors, different horns, and different hands may require adjustment to the levels of occlusion to produce various pitches, and these may also change depending upon direction of approach or speed of the passage. For a comparative table of stopped notes according to different authorities through the nineteenth century, see Moreley-Pegge, The French Horn, 99.

72 As in the previous chapter, no additional marking indicates the hand is in the neutral position; 0 is half stopped; • three-quarter stopped (mostly occluded); + fully stopped; 0 wide open (which raises the pitch, up to a quarter tone). Recall that most horn tutors (and especially those before Dauprat in 1824) are non-specific about hand positions. Louis F. Dauprat, Méthode de Cor Alto et de Cor Basse, 3 vols. (Paris: Schonenberger House, 1824).
Example 1.6. I. Andante, mm. 8–29, Waldhorn in E-flat (executed on Waldhorn)

The first two pitches are unaffected partials 6 and 9 of the harmonic series; in E-flat, they will sound B-flat and F. Recall that any horn designed to be played with the hand in the bell is insufficiently long without the hand; therefore, in order to even have a horn in E-flat (as opposed to something around E-quarter-flat, the length afforded by the crook and horn tubing), the hornist’s hand will be present in the neutral position. This hand position also facilitates the next movement, when the hornist is to play the written C-sharp, which falls outside the series. The Waldhorn player cups the hand further in the bell to bring the palm of the hand closer to the
opposite wall of the instrument’s throat (indicated by $\phi$), lengthening the vibrating column of air: the E-flat length horn becomes a horn in D, where the ninth partial will sound E-natural.\(^{73}\)

The hornist then opens the hand, returning to neutral position and to the E-flat harmonic series to sound partials 9 and 10 (notated D and E); they will close the hand to produce the notated B and A (m. 11). While the first eighth note (notated B, sounding D) sounds the tonic of the hand-wrought D length horn (8•), note that the latter pitch, sounding C-natural, is accessed by means of the D horn’s seventh partial, which is typically avoided in most musical sounding because it is flat in pitch when compared to most temperaments. The hand hornist, however, remediates this discrepancy quite easily by slightly opening the hand (hence the marking of only somewhat covering, “half-stopping,” which I have notated $\phi$) in the approach to this note, thus shortening the instrument and raising the pitch.

Opening and closing the hand colors and shades the melodic line: thus a notated B is not only lower in pitch than a C, but is also more veiled in sound—timbrally and dynamically.\(^{74}\) Moreover, there is not merely open and closed, but intermediate lengths upon which the hornist calls, such as with the notated A: the effect is not only a binary on-off, black and white, but rather a sense of shading. This shading is also traced, perhaps, in a sort of timbral progression through these presentations: the violinist presents the theme (mm. 1–8), echoed by the horn at

\(^{73}\) While we are not focusing on the mechanics of the embouchure in this chapter, note that the hornist will adjust lip tension between the notated D and C-sharp: the aperture slackens slightly so that the frequency of the lips’ vibrations will match an available mode in the new length of the instrument, establishing viable standing waves and resonance at that pitch. The point is that this is not merely a shading of the sounded F to produce a virtual (or perhaps phantom) E-natural, and it is not the ninth partial of an E-flat horn affected after the fact. Rather, the change is material, not merely at the level of perceived frequency but at the source: what is produced is the actual ninth partial of an actually differently-pitched instrument. The same frequency is used whether the player is playing a Waldhorn or a Ventilhorn, a horn in E-flat or a horn in D.

\(^{74}\) Experientially, the more stopped the Waldhorn (the more extreme bend within the hand tubing), the more resistance the player feels from the air in the instrument. This is also the case with valve design: sharp angles in the horn uncomfortably reflect air back to the player, where the smoother curves of later designs allow the vibrating air to continue through the tube with less impedance. To this end, horn and valve design in the twentieth century has largely focused on removing as many bends as possible.
pitch (mm. 8–16) with its subtle shading, who then transposes it diatonically upward to a yet more timbrally marked register (mm. 21–9).

Practiced hand hornists can mitigate to a fair extent the distinction in order to create a sense of relative balance throughout the melodic range of the Waldhorn, and a sympathetic listener will similarly cultivate balance on the hornist’s behalf.\(^\text{75}\) Since loudness however, heightens the distinction between closed and open tones, the hornist cultivates a softer dynamic and more veiled sound, overall, to create this balance.\(^\text{76}\) This is what Brahms was referring to when he emphasized the Waldhornist’s—and indeed, all the musicians’—obligation to play softly on account of the stopped notes: an attempt to balance the sound between the various levels of closure of the horn needed to produce these melodies, but also within the ensemble as a whole.\(^\text{77}\)

\(^\text{75}\) Much in the same way that a listener can imagine a piano to be legato, even “singing” through a melody, although its sound decays immediately after the hammer strikes the string.

\(^\text{76}\) Domnich remarked, “In order to achieve” more balance, “no other means has yet been found as yet than blowing the open notes more softly so that the stopped notes, which sound weaker, will not make too great a contrast with the open” (cited in Fitzpatrick, The Horn and Horn-Playing, 183).

\(^\text{77}\) Peter Jost has made the claim that Brahms wrote the Trio for the Ventilhorn and edited back for the Waldhorn. “Die Verifikation des Autograph, das auch als Stichvorlage zum Erstdruck diente, ergibt eindeutig, daß Brahms ursprünglich keineswegs das Waldhorn, sondern durchaus das übliche Ventilhorn vorsah” (“Klang, Harmonie und Form,” 61). His argument turns on two small edits made to the horn part in the autograph, likely after the first performances: (1) a simplification of a part previously in unison with the violin in the finale (mm. 95 and 97) and (2) an ossia which allows a somewhat difficult gesture to be played up an octave, in a more secure register, in the Adagio mesto (mm. 40–41) (in Ibid., 62). Using Riemann’s orchestration treatise (written following the decline of the Waldhorn) and personal correspondence with present-day hand horn specialist Thomas Müller, Jost—incorrectly, in my view—determines that these gestures would not have been possible on the Waldhorn, or at least so difficult as to suggest that Brahms intentionally required the valved instrument. Unfortunately, Jost did not consult contemporaneous horn tutors, such as master teacher Henri Kling’s 1865 Hornschule (New York: Classic Reprints, 1973 [1900, 1865], 22) that demonstrate that both gestures are feasible, though difficult, on the valveless instrument. I imagine that Brahms’s edits are instead the kind that might appear in any autograph to adjust not for instrumentation, but for pragmatism.

As numerous other writers have shown (see footnote 45 above), the writing throughout the Trio is otherwise idiomatic to the hand horn and, as I hope to demonstrate here, even more poetic by virtue of the Waldhorn’s technology.

For practical information on applied hand horn from the valved hornist’s perspective, hornists are encouraged to refer to Paul Austin, A Modern Valve Horn Player’s Guide to the Natural Horn (Cincinnati: P. Austin, 1993) and Heidi F. Wick, “Applying Natural Horn Technique to Modern Valved Horn Performance Practice” (DMA document, The Ohio State University, 2001). Garrett’s dissertation (“Brahms’ Horn Trio”) also includes some suggestions to the modern hornist when approaching the hand horn in the Trio specifically, and is a masterful analysis and reading of the work.
Recall that this stopping technique was how the orchestral horn was played through the Enlightenment until well into the nineteenth century. As this theme demonstrates in its melodic complexity, veiled sound, and softer dynamic, the hand hornist’s songful melodies came together to distance the Romantic Waldhornist from their hunting origins, a transformation from the present thrill of the hunt into what musicologist John Daverio called an “emblem of distance” and poetically, the sound of faint memories rimmed with haze and nostalgia. The Waldhorn is that which plays Mendelssohn’s “Nocturne” in *A Midsummer Night’s Dream* and that which sings from the shore in Schubert’s *Auf dem Strom*. In other words, the idealized Romantic poetic horn of absence and interiority was, I believe, not only a poetic transformation of the horn’s image but also a function of the normalization of hand technology. Whether sounding a simple horn fifth or a more complex melodic line, the mellifluous, Romantic horn of poetic imagination sounding hazily and longingly from the distance is, in fact, neither a hunting horn nor merely the orchestral Waldhorn, but rather the Waldhornist—the combined technicities of player and instrument—and their habituated encounter in the concert hall.

The Waldhornist’s particular way of wedding melody to timbre can be likened to Barthes’s “grain of the voice”: the perceivable materiality of the body in creation—“the body in the singing voice, in the writing hand, in the performing limb.”78 From the drastic perspective, this suggests the value of the Waldhorn might not only be its image, or even its timbre, but this bodily labor made audible. Elsewhere Barthes described the grain in different material terms: “the singing voice is not the breath but indeed that materiality of the body emerging from the

throat, a site where the phonic metal hardens and takes shape.” Rather than the crystallic instrumentalization of the vocalic body, with the Waldhorn, this grain may be present where instrumental metal softens as it meets the hand in performance, a bit of friction created by its otherwise illegible gestures, a making-singing-body of the instrument. In the space of the Trio, Brahms’s emphasis—even insistence—on timbre, dynamic, and balance is echoed by Barthes’s attention to execution, that is, the pronunciation of musical language, not just what it articulates: to not smother that which signifies in favor of its significance.

In his chapter on the horn, de Souza notes a shift in the horn’s poetic significance in the nineteenth century “to the representation of an instrument that is not just distant, but actually absent,” as, one supposes, is the case with the horn fifth memories in Schubert’s “Der Lindenbaum,” where the schematic evocation of the horn is accomplished by the piano. De Souza concludes that “horns seem to be simultaneously present and absent, real and ideal. They might thus be understood as virtual instruments, as phantoms haunting the music or its listeners.”

Let us return to the horn fifth, that topic that spoke farewell for Beethoven (ex. 2.4) or of longing and memory for Schubert (ex. 2.3), and which Brahms evokes with an almost excess of poetry in the Adagio mesto (ex. 2.5). He calls for the hornist (an actual hornist) as alto and violinist as basso (a kind of phantom horn, a virtual hornist) to be quite soft, a dynamic that runs

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80 de Souza, *Music at Hand*, 162. De Souza’s chapter about the horn is as much about its technicities as about topical evocation of the horn and the role of Pierre Schaeffer’s modes of listening, which can separate sound from source in favor of other parameters of musical hearing. For more on Schaeffer’s acoustics, see Brian Kane, *Sound Unseen: Acousmatic Sound in Theory and in Practice* (Oxford: Oxford University Press, 2014). Perhaps similarly, Goehr writes that the “transfiguration” promised under the Romantic work-concept “also depends on a certain kind of illusion, the ability to see or hear in a physical object or performance, less the concrete or physical, than the transcendent” (*Imaginary Museum*, 167).
counter to the very purpose and jaunty _topos_ of the hunting horns that will be heard in the final movement but completely in line with the hand-shaped affordances of the hand horn and the established Romantic poetic horn imaginary (the signified). Moreover, as the gesture continues, the hornist and violinist are able to balance dynamically because of the Waldhorn’s technicities (as signifier): the hand tube at the end of the instrument that allows the E-flat length horn—the actual hornist—to sound again in F major.

You may recall that in the _Eroica_ that Beethoven, too, had the horn (necessarily a hand horn) in the first chair play important melodic material in F major in the recapitulation; however, Beethoven asked his hornist to shorten the tubing length via a metal crook—a _corps de rechange_, an obviously technological intervention—with the effect that the whole passage of noble character could sound homogenously on the “open” horn in F. Recall also that this change was not instantaneous, but required that this first hornist be taken out of commission while replacing the crook.

Like in the finale of the Trio, Brahms’s horn fifth here in the _Mesto_ does not grant such time: the horns must be able to pivot almost instantaneously. Fortunately, the hand horn allows for this by using a combination of covered and open tones. Though F major is typically brighter than E-flat, these factitious, phantom “horns” sound even more distanced and hazy. This is not only due to the written dynamic, the harmonic shift from the tonic of the Trio, and the switching of roles within the paired figure (all apparent from the score), but because of the necessary gestures, almost private inside the bell, that afford the Waldhornist this tonal pivot. These audible but otherwise illegible shifts in timbre and dynamic make a horn that sounds yet more distanced, while the violin stands in for another horn, absent.
Brahms wrote with the Waldhorn’s technics in mind not only in the Trio, but throughout his oeuvre, from the Op. 17 songs for women’s choir, two horns, and harp to the symphonies and the overtures. While there is no lettered correspondence mandating the Waldhorn beyond the Trio, all of Brahms’s music with the horn remained idiomatic to and shaped by the Waldhorn’s affordances, which explains the wide-ranging keys (as in crooks) of horns, creating occasional transpositional difficulties for even seasoned hornists, and their parts’ general basis around the harmonic series. Yet, as the composer once lamented in a letter to Ferdinand Hiller, “I write for the most beautiful Waldhorns and D-flat trumpets, but I don’t expect to hear them.” Though they may have been imagined for the Waldhorn, Brahms’s works would have been—with the exception of the Trio—performed and transposed upon on the chromatic Ventilhorn, to which we now turn.

**The Invention of the Valve**

On December 6, 1814, Pless court hornist Heinrich Stölzel wrote to Friedrich Wilhelm III, the King of Prussia, to describe the results of his recent experiments on his instrument:

Most illustrious, most mighty King
Most gracious Lord and Majesty!

The horn, to which I have chiefly dedicated myself, is most defective as regards the inequality of its notes and the impossibility of producing them with the same purity and strength. This fact often made me very impatient and led me to make experiments which might alleviate the problem, which at the beginning were all failures, but which finally led me to an invention, which rewarded me for all my trouble and satisfied my demands on the

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81 February 1869, in Avins, *Johannes Brahms: Life and Letters*, 379. See also Avins, “Performing Brahms’s Music: Clues from His Letters,” in *Performing Brahms: Early Evidence of Performance Style*, ed. Michael Musgrave and Bernard D. Sherman (Cambridge: Cambridge University Press, 2003), 11–47. In the latter, Avins repudiates the idea that the symphonies were intended for Waldhorn based on the lack of correspondence indicating Brahms’s preferences. Anneke Scott, however, argues for their use based on the horn writing in the cycle for the Orchestre Révolutionnaire et Romantique’s recording project in “Brahms and the Orchestral Horn,” 119–33. Personally, my performance of and engagement with the symphonies on valved horn gains much from considering them as they would be executed on the Waldhorn.
instrument. My horn can play all the notes from the lowest to the highest with the same purity and strength without having to stop the hand into the bell. The mechanism of my invention is most simple, can be employed easily and quickly and everyone who plays the instrument can make himself thoroughly familiar with its application in a few days. This device renders the many crooks superfluous and makes it possible for the artist to play all the notes without losing any of the instrument’s tone. This mechanism can also be applied to the far more imperfect trumpet and even to the bugles. Because the trumpet, whose compass hitherto consisted of 13 notes and through my invention has received 24 additional notes, which sound just as beautiful and pure as those 13 and for which now composers may write in not so limited fashion, but in any major or minor key as they wish, I believe that I do not exaggerate in promising your Majesty that by means of these instruments music may be made which will astound the world. I submit myself to every examination and am of the assumption that your Majesty may assist me further in this matter which is so important to the world of music and I am in the happy anticipation and yearn for nothing more than to be able to lay my instruments at your Majesty's feet which would then give me the hope of your Majesty entrusting me with the introduction of this new music to the regiments and of rewarding me according to the value of my invention.
I remain your most humble servant,
Pless. on the 6th Dec. 1814
H. Stoelzel [sic]\textsuperscript{82}

In the letter, Stölzel notes his impatience with the “defects” of the Waldhorn, those which his invention “alleviates” or corrects, namely its limited range and the imbalance of dynamic and timbre created by hand stopping. What he describes is an instrument that, by virtue of his simple mechanism, affords a full and homogenous chromatic compass without the use of crooks.\textsuperscript{83} This marvelous invention—though he does not name nor describe it as yet—is easy to master and therefore, he suggests, should be introduced to the regiments.


Around the same time these experiments were taking place, manufacturers were also experimenting with a favorite curiosity of modern hornists, an “omnitonic horn” that, like Stölzel’s invention, made separate crooks superfluous; however, a hornist would have to move the mouthpiece, move a section of tubing, or, in the case of Sax’s version (fig. 2.4) adjust the plunger in order to select various lengths. Developed for a French market that had mastered the chromatic hand horn, these horns were not designed to eradicate hand technicity, but rather only that of the detachable crooks, and the hornist would still use hand technique once a new fundamental had been set.

Figure 1.4. Charles-Joseph Sax, omnitonic horn, Brussels, 1833. Brass, 54.9cm (height), 42.2cm (width), 29.1cm (diameter of bell). New York: Metropolitan Museum of Art.
Stölzel’s idea, rather, was to use an independent valve: a device that regulates or controls the flow of a fluid—whether liquid or gas—through the passageways of a single unified system. There are valves in the body, such as control the flow of blood through the circulatory system. While examples of engineered valves date back to Greek and Roman antiquity, the Industrial Revolution spurred the refinement of valve manufacture, operation, and new applications in industry, including in the steam engine and, importantly, in mining, which we will examine later as part of Friedrich Blühmel’s rival patent application. Stölzel and Blühmel were ultimately issued a joint patent for the invention of a chromatic horn with two manually-operated valves in 1818.84

![Figure 1.5. Stölzel-Blühmel valve design (“box” valve), from Grove Music Online, “Valve (i)”](image)

When applied to a brass instrument’s tube and activated by depressing a finger button (marked [a] in fig. 2.5), the attached valve (implied under [a]) opens a new windway within the instrument. In the example, air enters from the center left and passes through the valve section

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84 Fitzpatrick mentions that horn maker Leopold Uhlmann I, who is best known for the 1830 patent of the double-piston “Vienna”-type valve, may have experimented with valves as early as 1810; Fitzpatrick recalls having seen an Uhlmann valved horn dated 1818 (The Horn and Horn-Playing, 142). No other sources to my knowledge corroborate this.

(boxed). If the finger button is in the default, raised position, air will pass directly through and out, shown with the solid arrows. If the finger button is depressed, the air will be redirected through section (b) as shown by the dashed arrows. Thus the valve instantly adds a discrete, short length of metal tubing within the corpus to create a longer total instrument upon which the instrumentalist will sound the overtone series. One valve adds enough tubing to lower the instrument by a half-step; another, a whole step. A third valve, already standard less than a decade after the initial patent, will lower the instrument by three semitones. The instrument can be returned to shorter length by releasing the finger button to return the valve to its neutral seating. By combining the fundamentals and partials of seven different valve combinations—that is, seven different lengths of horn—the valve affords the Ventilhornist (or the “far more imperfect” trumpeter or bugler that Stölzel also mentions) the ability to play chromatically throughout its range (fig. 2.6).  

86 Note that hole-and-key systems were applied to trumpet and bugle sometime in the late eighteenth century, creating the chromatic instrument for which Haydn wrote his trumpet concerto, that were still used through the first half of the nineteenth century. See also Robert Apple, “The Keyed Trumpet in Italian Music (1824–46)” paper presented at the 2019 American Musical Instrument Society Meeting, Greenville, SC, 16 May 2019. We can assume that the trumpeters and buglers Stölzel refers to did not have access to these instruments, and these were replaced by valved versions much more quickly than in the case of the horn.

Writing in 1824 when the valve horn was known as a curiosity in Austro-Germany but not yet known in France, Dauprat’s Méthode contains a section “On Changes and Perfections that One would want brought to the Horn” (I, 5; trans. in Snedeker I, 169–70). In the article, he describes hole and key systems such as used on the trumpet (likely the Klappentrompete used by Haydn for the Trumpet Concerto), but notes that they would be undesirable for the horn because it would lose the “true quality of its natural and false sounds” (Ibid, 170); note that Dauprat’s valuation of facticious notes is not negative, but rather considers them to have a kind of rightness or truth.

Dauprat continues: “As soon as all [sounds] would be found together in a single cluster [bundle], forming only a single and even instrument, it would be fine, if one wanted the same range of low, high, and middle sounds; but the more new inventions equalize all these sounds, the more the character, the color and the timbre of the Keys [crooks, which embody key characteristics] are found to be unnatural and confused” (Ibid.) In this, Dauprat anticipates the debates surrounding the Ventilhorn that would extend through mid-century.

Dauprat’s tutor would be edited for valved horn by later Conservatoire teacher François Brémond and re-published in 1893, changing the title to de-emphasize Dauprat’s cor alto and cor basse genres and, since the valved horn had almost achieved ascendance in France at this point, omitting this section among others and replacing it with a fingering chart for valved horn. (Louis F. Dauprat, Méthode de Cor, ed. François Brémond, revised edition (Paris: Lemoine et Fils, 1893). Though he preferred the natural horn (cor simple), Brémond would later be responsible for converting the Conservatoire to valved horn (cor chromatique) as the primary instrument after the turn of the twentieth century.
Adapted from Moreley-Pegge, *The French Horn*, Appendix I, assuming a horn with three descending valves. Note that valved hornists can also avoid entire certain partials, such as p7, p11, or p13, in order to create a more or less equal tempered chromatic scale without use of extensive lipping or hand horn technique. This will be taken up again in the fourth chapter. See also Appendix B in this document.
Consequently, the hornist can recreate any music at any pitch level or in any key—that is, in full transposition—instantaneously, without the time-consuming crook change of Beethoven’s first horn. Moreover with the valves’ location on or within the corpus of the instrument, as opposed to the hand hornist’s variable tubing at the end, this broadened extensive chromaticism is available with a homogenous, open sound. Because all pitches are “natural,” open partials of the harmonic series of the instrument’s tubes alone, they are available with “the same purity and strength,” as Stölzel promised.

The Valve’s Technicities of Re-Embodiment

In his initial review of Stölzel’s invention in the 1815 Allgemeine musikalische Zeitung, Bierey described that Stölzel’s two valves were operated by the right hand—the one which had previously stopped the instrument—and thus, we surmise, with the hand removed from the bell of the instrument.\textsuperscript{87} While we cannot know Stölzel’s rationale for placing the valves in the right hand, we can consider that the tendency for right hand dominance—whether biologically or socially inscribed—may have been a factor.\textsuperscript{88}

Stölzel and Blühmel’s first instruments are, unfortunately, lost. However, the invention both spurred and was part of the flurry of instrumental and industrial innovation in the nineteenth century that, over the course of the next few decades, would realize the development of several


different types of valves and the creation of new instruments for the brass consort.\textsuperscript{89} However, even an early example—Leipzig-based Christian Friedrich Sattler’s improved “chromatic Waldhorns with valves,” was announced by the \textit{Allgemeine musikalische Zeitung} in 1819 and introduced several aspects of the valved horn design that remain standard to this day: the standard count of three valves and their relocation upon the instrument’s corpus to where one hand previously gripped the instrument, “whereby the common manner of holding the instrument can be maintained,” allowing the other hand to remain in the bell.\textsuperscript{90}

The natural horn was historically a somewhat ambidextrous instrument, especially once it was brought into the concert hall. Particularly before the development of hand stopping technique, hornists and their bells would be distributed in various symmetries to both please the eye and to allow the hornists to better hear one another.\textsuperscript{91} Even after the standardization of hand horn playing, orchestral players were advised to become fluent in the technique with either hand for similar reasons, and the development of the \textit{left} hand as bell hand was particularly recommended for those aspiring to be a \textit{primarius} (cor alto), so that the bell of their instrument would be next to that of their lower partner.\textsuperscript{92} Regardless, Richard J. Martz’s rich recovery of “reversed chirality” on the horn traces a marked alternative that proves the general rule: typically, the hunting horn was held over the right arm (in order to retain the reins in the left),

\textsuperscript{89} The most common valve types—Riedl’s rotary valve, Périnet’s piston valve, and Uhlmann’s double-piston “Vienna” valve were all developed in the first half of the nineteenth century and have been used, with refinements, continuously to today.
\textsuperscript{91} Additionally, the physical proximity of bells was recommended for distributed relay playing but between horns crooked in different keys, a pre-valved technique of “aural deception” which allows for a melodic line to be composed between the open tones available on different horns; outlined in Ahrens, \textit{Valved Brass}, 5–6. This is also the principal behind the handbell choir or the Russian “eintonhorn” capella.
\textsuperscript{92} Such as in J.H. Goeroldt, \textit{Ausführliche theoretische praktische Hornschule vom ersten Elementarunterricht an bis zur vollkommensten Ausbildung}, reprint edition (1822; Kirchheim: Hans Pizka Edition, 1987). Dauprat implies that the choice may also be a result of geography. Martz, “Reversed Chirality in Horns,” 188–9.
and this was the available right hand that ultimately found its way into the downturned bell by
default, with the left hand now holding the top of the more tightly wrapped horn in front of the
player.⁹³ While noting the ultimately arbitrariness of handedness, horn tutors implied a right-
handed instrument—an instrument whose technicities were the provenance of the right hand—in
their instructional language, including in Fröhlich’s image, above.⁹⁴ Thus, for Stölzel the hornist
(and quite possibly a cor basso, almost always right-handed player), it was highly likely the right
hand was understood as the one which does the dexterous work of shaping the sound into
melodies, and therefore understandable to conceive of placing this new activator on the right
hand.⁹⁵ Indeed, it remains the case that—except for the now-standard chromatic horn, following
Sattler’s “improvements”—the valves on the majority of brass instruments are, by default,
operated by the right hand.⁹⁶

Bierney’s reporting pointedly indicates that the chromatic Waldhorn benefited from the
valves being placed on the left side.⁹⁷ The placement of valves upon the instrument forced the

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⁹³ Martz, “Reversed Chirality in Horns.”
⁹⁴ Such as in Duvernoy’s 1803 Méthode, 3: “Il est indifferent que l’écolier tienne le Cor de la main droite ou de la
main gauche; il peut se donner autant d’aisance de l’une que de l’autre. Cependant j’établirai mes principes sur la
manièr que j’ai adoptée. Il faut que la main gauche tienne le Cor, et que la droite soit placée dans le Pavillon.”
Where Duvernoy suggested this manner, Domnich, by contrast, insists upon the arrangement by dint of the position
of the coulisse, the tuning slide (Méthode, 29). Both the instrument’s arrangement and Domnich’s tutor could be
considered examples of technologies which force chirality.
⁹⁵ According to Martz (“Reversed Chirality in Horns,” 192–3), it is highly likely that it was a right-handed (that is,
with the right hand operating the valves) Ventilhorn which gave the premieres of the first works for the chromatic
horn in Berlin in 1817 and 1818, including Friedrich Wilhem Berner’s works for Stölzel and Georg Abraham
Schneider’s Konzert for 4 Hörner (3 Waldhorn and 1 Ventilhorn) und Orchestra. Interestingly, the latter work uses
the valved instrument on a higher part, as opposed to a lower part where it would benefit more, likely to make a
spectacle of the new instrument’s affordances.
⁹⁶ Opposite handed instruments have been and remain available instrument customizations from manufacturers.
Most students, however, will begin on the instrument’s standard interface—left hand at the valves—regardless of
their individual handedness. As Hertz describes in his sociology of handedness, preference for one or the other hand
is inscribed as much or even more by social practice and training—we might consider technologies of the self, after
Foucault—than by simple biological preference.
⁹⁷ As reported by Schneider in the 1820 Allgemeine musikalische Zeitung (cited in Martz, “Reversed Chirality in
Horns,” 191), now “pressed by the fingers of the left hand,” though as Martz points out, we do not know in which
direction the bell was facing. Regardless, “the common manner” of holding the instrument implies that one hand—
now presumably the right—remained in the bell.
hornist’s chirality: the once ambidextrous horn shifted from a (generally) right-handed instrument to a left-handed one. Yet by preserving “the common manner,” Sattler’s chromatic Waldhorn and those following it would enjoy familiarity in the hands even while inviting a new technique by its executant, and retain the essential position of the sound-shaping hand in the bell that grants the horn its characteristic romantic sound. In one of the first tutors for two-valved horn, Joseph Meifred suggests the similarity: the hornist is directly referred to Dauprat’s method for how he is to hold the instrument, “with the difference that, to use the left hand, the instrument must be held only with the thumb and last two fingers to give the index and middle, placed on the valves, *freedom to move.*”¹⁰⁸ The two front plates from Henri Kling’s 1865 *Hornschule* (fig. 2.7)—published some twenty five years later, at the time when Brahms was touring with the Trio—show the dramatic shift between the visual forms of the instruments, this time for the three-valved horn, but also the more subtle shift in in the *player’s* corporeal mechanism.

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¹⁰⁸ “Avec cette différence, pour l’emploi de la main gauche, que l’instrument ne doit être tenu qu’avec le pouce et les deux derniers doigts, pour laisser a l’Index et au Médins, places sur les Pistons, la liberté d’agir,” Joseph Émile Meifred, *Méthode Pour Le Cor Chromatique Ou à Pistons* (Paris: Richaud, 1840), 5; emphasis added in translation. The first edition of Meifred’s method is for the two-valved horn that was standard in France for several decades; the second edition was an extended version for three valves. While the third valve was adopted quickly in Austro-Germany, the French were slower to adopt the three-valve system (as with the valve in total), and for some time favored an *ascending* valve in the third position. As the name suggests, by closing off part of the tubing when activated, this valve causes the horn to shorten and thus ascend. Meifred’s method also considers how to combine valve and hand techniques. For a summary, see Jeffrey L. Snedeker, “Joseph Meifred’s *Méthode Pour Le Cor Chromatique U à Pistons* (1840),” *Historic Brass Society Journal* 4 (1992): 87–105.
James Q. Davies examines the hands and voices of pianists and singers at the dawn of modern performance technique, specifically in Paris and London of the 1820s and 30s.\textsuperscript{99} As he reconstructs “a story about embodiment and reembodiment,” Davies argues that, alongside and through developments in medical science and notions of bodily health, music can be “an instrument for the induction, even acquisition, of hands and voices.”\textsuperscript{100} Music becomes a practice that articulates and locates “artful and actual” bodies, what he proposes in the book’s title as \textit{Romantic Anatomies of Performance}.\textsuperscript{101} As an example of such a “romantic anatomy,” he observes how the pianist’s hands transform from a center for reflexive feeling for Chopin, to a

\begin{footnotesize}
\textsuperscript{100} Davies, \textit{Romantic Anatomies}, 8, 2.
\textsuperscript{101} Ibid.
\end{footnotesize}
site of orthopedic control and exercise for Thalberg, to an estranged object through nerve science and become potential friends or enemies of Liszt’s will.

The seemingly subtle difference in the manner of holding the horn takes for granted a revolutionary transformation in the body of the brass player—one that the reception of the valve has overlooked. Anatomical transposition refers to the shift of an organ across the body. With the valve’s new technicity, pitch selection for the hornist moves from the right hand’s stopping position to the left digit-at-lever position that can be embodied in a standard fingering chart. Valve technicities thus set into motion what Szendy calls a “whirling,” a “tropology of the organs” when the body encounters the instrument, *corps à corps*. As part of a new machine-tethered “anatomy of performance,” these levers have invited the hornist to utilize the hand at the top of the horn’s corpus, but also, for the first time, their fingers. The hornist’s hand has, in effect, articulated digits to operate this mechanism. Indeed, *corps à cor à pistons*, the hand hornist with a gesturing bracciochiral hand-at-the-end-of-the-arm is re-organized into a valved hornist with a chirodigital hand, with fingers that are instrumental—ones that can use tools, that can count, and can display their musical techné. The arrangement of fingers on valve levers—the hornist’s new romantic anatomy—grants a freedom of movement and a kind of musical know-how heretofore unknown on the horn, both on the hand and through music.

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102 *Phantom Limbs*, 73.
103 The concepts of bracciochiral and chirodigital are from Raymond Tallis, *The Hand: A Philosophical Inquiry into Human Being* (Edinburgh: Edinburgh University Press, 2003), cited in de Souza, *Music at Hand*, 134. For Tallis, chirodigitality is a crucial factor in the evolutionary distinction between human and animal, permitting not only the use of tools, but the ability to count and create abstraction.
Around the same time that court hornist Stölzel began his experiments with the horn, mining town band trumpeter and hornist Friedrich Blühmel began his own experiments with valves. In a rival patent application of February 1818, he describes his inspiration:

The numerous uses of the mechanical forces, which I had an opportunity of seeing during my presence in Upper Silesia, particularly the various air pipes used in the blast apparatus of the high and low furnaces which always led me back to the basic idea of executing an improvement on these instruments, I believe I could use to reach my goal and therefore sought the company of the keepers of the machines and other experts in order to comprehend the closing and opening of the wind pipes…. In Waldenburg I experimented with my idea and learned to solder in order to reduce costs. ... In 1816 I finally got results, whereby all the whole tones and semitones could be played on the trumpet by means of 2 valves and now there was nothing left for me to do but to simplify the mechanism even more and to confine it within a narrow space. ¹⁰⁴

Thus we can observe an example of the direct relationship between industrial technological innovation and musical ones. ¹⁰⁵ Steward Carter’s description of the phenomenon implies a unidirectional causality, that technology in the wider world effects musical performance: “technology influenced instrument construction, which in turn influenced orchestration, which in turn influenced composition…. To some extent, then, music was responsive to technological developments.”¹⁰⁶

It is a truism that the valve revolutionized brass instruments: with Stölzel and Blühmel’s new mechanism—for which they were ultimately issued a joint patent—the horn and trumpet became fully chromatic and equalized in power and tone throughout their ranges, and enhanced the lower register with the addition of lower fundamentals and the possibility of always-open

melody. It was not only quickly adopted on the trumpet and bugle (creating the chromatic trumpet and cornet, respectively), as Stölzel forecasted, but it also enabled the development of the lowest member of the orchestral consort, the tuba, as well as a host of intermediary instruments. The simple tube of trumpet and horn, and even for a time the trombone, became valved machines for expanded kinds of musical labor, with fingers as new laborers—machine operators.\textsuperscript{107}

\textbf{Keyboardification and the Digital Analogy}

In his orchestration treatise of 1844 conductor and composer Hector Berlioz imagined the orchestra as a hyper-instrument, an assemblage of “strings, tubes, chests, and surfaces made of wood or metal—machines bearing intelligence but subordinate to the action of an immense keyboard played by the conductor” able to re-create what the composer has set before them.\textsuperscript{108} His dream was already partially realized in the orchestral automatons—really mechanical organs—that Dolan describes in \textit{The Orchestral Revolution}.\textsuperscript{109} Earlier in the monograph, Dolan demonstrates that the standardization of orchestration was a function of stabilizing the ensemble

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\textsuperscript{107} The valve trombone was, for a period of time in the nineteenth century, more popular than the slide trombone, and remains popular in certain areas of Europe and several former colonial states. The cimbasso, a valved bass trombone, was also used prominently by Italian composers, including several operas by Verdi.


\textsuperscript{109} Orchestrion is the generic term for any large automatic organ designed to play large ensemble music, whether written for orchestra or band. The first successful orchestrion was Johann Nepomuk Mälzel’s panharmonicon of 1805, which could replicate any military band instrument of its day. Incidentally, he commissioned Beethoven for a work for his orchestral automaton to commemorate Napoleon’s defeat at the Battle of Vitoria in June 1813; the composer responded with a battle symphony that he would later re-orchestrate (for actual orchestra) as \textit{Wellington's Victory}, Op. 91. The work (an interesting boundary object toward a definition of artefactual music) proved profitable for the composer following the premiere in December 1813, which also included the premiere of the Seventh Symphony and a work for Mälzel’s own trumpeter automaton accompanied by the orchestra.

Friedrich Kaufmann also presented various composite instruments—including a belloneon containing 24 trumpets and two kettledrums, a cordalaudion that merged a piano with four flutes, and a harmonicord, a kind of bowed-string piano (not unlike a hurdy-gurdy)—alongside a mechanical (natural) trumpeter.
and passing musical material through it. As we observed with the fugato in the development of the *Eroica*, re-creating music through instrumentation, arrangement, transcription, or even transposition requires shared and consistent affordances and abilities.\(^{110}\) Because a cello can play the same pitches and rhythms as the horn, Simrock could include a transcribed part to substitute for the horn in Brahms’s opus 40; similarly, because all the instruments of Brahms’s Trio can play the pitches of the E-flat harmonic series, they can all play the hunting horn topic that begins the fourth movement—they can, as de Souza has shown, all become horns.

Conversely, the Waldhorn’s weighty extra-musical associations—where its timbre *alone* can index something beyond the concert hall—make it difficult for a horn to become anything but. But beyond these characterological evaluations, the Waldhorn does not afford the thorough chromaticism of the violin or the piano, and as such, was heard as having limited or restricted musical potential, especially in the space of the concert hall and within the polity of the orchestra or chamber ensemble, the domains of the composer’s voice. Take, for example, Leipzig music director, organist, and composer Friedrich Schneider’s examination and reporting on Stölzel's horn in 1817:

> Because of its full and strong, yet soft and attractive tone, the Waldhorn is an extremely beautiful instrument; but, as is well known, it has until now been far behind almost all other wind instruments in its development, being very restricted to its natural notes .... Herr Stölzel of Breslau has now completely removed these shortcomings .... He has simply provided his horn with two airtight valves, which are depressed with little effort by two fingers of the right hand, like the keys of the pianoforte, and restored to their previous position by the same two fingers with the help of attached springs....\(^{111}\)

\(^{110}\) See de Souza’s chapter on compositional instruments, *Music at Hand*, 109–44.

Where Stölzel’s letter focused on the tone and ease of the valved instrument, Schneider’s review explicitly focused on the possibilities for composers. Full chromatic motion and homogeneity allows for the instrument transpose instantly, and thus affords the composer the ability to write in a new manner for the horn.

Importantly, he names the device as “valves,” and describes their action, “depressed with little effort by two fingers of the… hand, like the keys of a pianoforte.” In making an embodied analogy in his description, Schneider operates upon the assumption of familiarity, transparency, or Heideggerian handiness of the keyboard to his readers. Yet there may be more to this comparison: I suggest that to be more responsive to the control of Berlioz’s orchestral keyboard, some aspects of the keyboard—or the keyboardist—reterritorialized upon orchestral horn itself.\(^{112}\)

A keyboard is not an instrument, per se, but an interface—a site or boundary where the exchange of information, as input and output, occurs. The keyboard interface has been widely used for centuries in the West to access a variety of chordophonic (piano, harpsichord, clavicord), aerophonic (organ, accordion), idiophonic (carillon, celesta), and electronic (Moog synthesizer, Hammond organ, MIDI controller) sounds through a consistent action—where the player’s finger presses a key and to which one, and typically only one, pitch is assigned. The interface can lend almost any sound a crucial familiarity under the fingers of the operator, from the piano to the organ to the Moog synthesizer, to more fanciful applications with the

\(^{112}\) The notion of territorialization is from Gilles Deleuze and Félix Guattari’s influential philosophy of immanence and described most fully in *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi (Minneapolis: University of Minnesota Press, 1987), the notion was suggested for instruments by Dolan and Tresch in “Toward a New Organology,” 286–88. The direct line of inquiry I propose could be usefully traced on other nineteenth century instrumental developments, such as the increased keywork on the Boehm flute.
imaginative cat piano or the actual Furby organ. Berlioz’s keyboard imaginary posits the orchestra, perhaps, as a massive organ, no longer individual players but programmed ranks that respond to the composer’s will embodied in the touch of the conductor at the controller.

Roger Moseley examines the programmed and programmable relations afforded by this privileged interface in his monograph *Keys to Play*. Drawing upon game and media theory, Moseley posits dense and productive “digital analogies” that maneuver between and across the digital and the analog—between that which is discrete and that which is continuous, across the (seeming) binaries of countable quanta and bendable qualia, of multitudes and magnitudes, the rational and irrational, the technological and the musical—tracing the play of the body’s digits over the topography of the keyboard through media genealogy and cultural techniques in rich conceptual metaphor.\(^{113}\) The digital analogy helps to reveal, for example, distinctions between the monochord and the piano: where the single continuous string of the analog monochord would be divided to produce the pitches of the harmonic series, the digital piano assigns and spatializes single pitches onto individual strings, providing a one-to-one ratio and a binary on-off. The monochord presents a magnitude, though it also makes countable the harmonic series, the composite quality of all musical sound we hear as timbre. The piano, by contrast, is materially distributed, coordinated into a new map of mediations between the multitudes of the keys of the keyboard interface.

The “digital analogy” can allow us to read for the relationships between other instruments, too. Around 1750, when Hampel was codifying hand horn technique in Bohemia, Prussian hornist Johann Maresch organized a corps of some forty uniformed Russian huntsman,

each armed with a different length of straight conical copper tube upon which only a single tone would be blown.\textsuperscript{114} The distribution of pitch between these “Einton” horns is an extreme example of relay playing discussed earlier; as such, the score (fig. 2.8) resembles a mid-twentieth IBM computing punch card or the so-called “travelling valves” of perforated piano rolls that would be developed in the mid-nineteenth.

![Figure 1.8. Printed score for Russian “Eintonhorn” music\textsuperscript{115}](image)

These living processors would switch their tone on and off, their discrete sounds giving rise to an amalgamated result that would be, on the conductor’s score, reduced to a pianist’s grand staff.

\textsuperscript{114} The individual instruments, then, are understood to have a narrow compass, though the ensemble’s combined range could be over four octaves.

\textsuperscript{115} Johann Christian Hinrichs, \textit{Entstehung, Fortgang und jetzige Beschaffenheit der russischen Jagdmusik} (St. Petersburg: I. K. Schnoor, 1796), n.p. Note that the squared brackets refer to rests.
The total effect was said to have charmed Holy Roman Emperor Joseph II when he paid a visit to Russia, “Very nice!” he exclaimed when Maresch was before him. “But what forty do here, a single man can do for me on the organ…. in my country we can put people to better use!” In other words, this distributed multitude of eagerly counting members in this disciplined, massed horn-blowing corps under the direction of a conductor could be more efficiently collected in the maneuvers of the fingers (and perhaps feet) of a single keyboardist.

We have already observed several ways in which the valve digitized the Waldhorn. By adding already discrete lengths of tubing—rather than analog, manually created ones—the corpus of the instrument itself was mechanized in order to tesselate the harmonic series’ irregular pitch space into the regular chromatic one (cf. fig. 2.6) Additionally, the player’s input becomes digital, in that the selection of these tube lengths occurs with the fingers—the body’s original tool for counting. To extend the touch, these basic fingering patterns are generally analogous across all valved instruments, whether trumpet, horn, or tuba; the valve depressed by the second finger always lowers the instrument by a half step. This consistency creates a familiar interface for the digitized brass instrumentalist, as much as the keyboard does for the pianist at the organ or the synthesizer.

The valve is, as Houtchens suggested, perhaps the most dramatic shift in instrumental technicity in the nineteenth century—a century full of instrumental development and exploration—and closes the gap between the melodic affordances of the horn and other musical instruments: a Ventilhorn can play chromatically and equally tempered throughout their

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compass, like a violin or a piano, and almost any material along with any section of the orchestra. By means of “digitization,” a kind of “keyboardification,” the hornist and the trumpeter are able to respond to the composer’s distant touch inasmuch as, in Johan Huizinga’s notion of play, man plays music through “nimble and orderly movements of the fingers.”

As a material interface, the piano territorialized upon the hornist, in turn providing new conditions under which the horn can, perhaps, not merely blasen (the German verb “to blow,” the verb traditionally associated with the horn), but play. We have digits on our feet, too, which allow hornists like Felix Klieser, who was born without arms, to play the horn. Through his cultivated pedodigitality, Klieser has become an award-winning virtuoso, recording not only the staples of the hand horn repertoire but also performing Schumann’s Adagio and Allegro, the first masterwork for the valved horn and piano, which sets the two instruments as finally on par as chamber music partners through their new shared affordances.

As Moseley describes, the keyboard is and largely remains a crucial site for musical creation and recreation, one which establishes “conditions under which ludomusical behavior [musical play] can emerge. Whether instantiated as an ordering principle, cognitive schema, or material interface, it provides a platform on which musical motives, gestures, propositions, and ripostes can be put into play.” Topic theory founder Leonard Ratner called the fortepiano “a

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118 Klieser has developed a way to correct for pitch, intonation, and color with the resonance space of his mouth alone. We might consider, then, that Klieser centralizes this labor into his mouth, where an armed hornist distributes it between the mouth and the hand. Regardless, the approach to sound is shaped by the historical presence of the hand in the bell.
119 Moseley, Keys to Play, 67.
quintessential locale for the play of a topic” beyond or in lieu of the ensemble.\textsuperscript{120} Recall, for example, the phantom horns we heard from Schubert’s or Beethoven’s piano.

As the horn became accepted as a regular member of the orchestra polity, and its workings codified in the material machinations of orchestration treatises and orchestral automatons, the composer’s keyboard came to present a defining mode of instrumentality territorialized upon the horn, the hornist, and its sound: a quartet of horns should be able to sound—always with ringing, open sound—Beethoven’s \textit{Lebewohl} or Schubert’s nostalgic quartet. In his work on recognizing topics versus executing rhetorical figures, Beghin notes that “if a keyboard sonata is a domestic version of a symphony or an opera buffa, then maybe [the play of topic] is more about listening and imagining than performing and stirring in a direct oratorical sense.”\textsuperscript{121} As an ubiquitous access point for imaginary listening to the horn in the home, the expectation becomes that what a keyboard sounds, a horn must sound. Open horns encountered at home piano become what we expect to hear in the concert hall, and what a keyboard knows musically—its musical techné—a horn must know.

Moseley acknowledges

That the keyboard’s ubiquity can render it virtually transparent both conceals and reveals the fact that an interface does not merely act as a conduit by which a musical thought is realized; it also conveys the force and inertia of a physical system of checks and balances that trains its players by establishing its affordances and mapping them onto a delimited range of sonic outcomes. Both ideologically and materially, the keyboard partitions and classifies sound, imposing discipline on the generation of acoustic material as well as the body of the player and the sensibility of the listener.\textsuperscript{122}

\textsuperscript{121}Beghin, “Recognizing Musical Topics,” 565.
\textsuperscript{122}Moseley, \textit{Keys to Play}, 90.
In the final chapter, we will return to the keyboard’s “rules of engagement and codes of conduct,” and the latter aspects of Dolan and Tresch’s ethics of instruments that are related to instrumental ideologies. For the moment, we will focus on the material ramifications of the keyboard as an epistemological object, how its affordances grab hold and redraw the instrumentalist and their sound. Affordances analogize and map through the digital—through the play of topic and digits—and the digitized affordances of the piano map through the analogical play of topic, shifting our expectations of how the horn and the body create and mediate sound for the performer and the listener.\(^\text{123}\)

Through the play of digits on the new interface, the hornist—or any valved brass player—now thinks through *fingerings* much like many other instruments, as we can see applied to the first movement example (2.7) from the Brahms Trio. The Ventilhornist connects complex windways within the instrument, discrete metal tubes accessed by digitally operated levers, to create E-flat, D, and D-flat horns upon which they sound partials 6, 9, 10, and 8.

\(^{123}\) The notion of the keyboard as epistemological object is echoed in Moseley, *Keys to Play.*
Thus these newly found fingers release the production of melody from the movements of the right hand which shaped and shaded the melody; the Ventilhorn affords all these tones with a

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124 The fingerings are based on a standard fingering chart included in Gumpert’s method (N.B. Gumpert published under the alternate spelling Gumbert): Friedrich Gumbert, *Praktische Horn-Schule* (Leipzig: Forberg, 1879). Almost all modern hornists will perform the work on a valved horn in F and apply the proper transposition. I retain horn in E-flat here for (1) easier comparison to the original example and (2) that Gumpert, the first known hornist to perform the work on valved horn at the private premiere with Clara Schumann in Leipzig in 1866, would likely have used a valved horn that included a terminal crook in E-flat. His 1879 method advocated for the use of crooking to maintain the characteristic colors of the open tones, particularly in the Waldhorn repertoire; the later Gumpert-Modell horn produced by Kruspe provided a set of terminal crooks for exactly this purpose. It is reasonable to assume he would have done the same here. A selection of terminal crooks were available for many valve horn types through the turn of the twentieth century, before the ascendance of the double horn.

N.B. While the third valve, which lowers the instrument by three semi-tones, is generally more in-tune, most hornists opt to use the valve combination of first (two semitones) and second (one semitone) together in order to avoid—as a pianist might—the “weak” third finger.
homogenous, always-open sound that, like most instruments in the nineteenth century, became louder and more equally-tempered. From this perspective, the horn is able to approach the piano’s transcendent ideal of musical autonomy by presenting less of its idiomatic techné in favor of the “abstract interiority of pure sound” and “pure motion.”

Since the part looks the same—since what it presents to the gnostic reader is descriptive of produced sound in terms of pitch, duration, and dynamic rather than prescriptive of the drastic actions taken to produce it—performance of the horn part in the Trio on either Waldhorn or Ventilhorn passes the “retrievability test” under Werktreue. That is, a legitimate, felicitous, or otherwise “good” performance on either instrument would be able to reproduce the part that Brahms provided the horn, and thus fulfill the work-concept’s staging of the composer as ultimate author of an artefactual and autonomous work of art and the performer as its medium.

In fact, the Ventilhorn is more transparent. However, performance upon the “improved” horn with its idealized, eternally open sounds tests the boundaries of fidelity to Klangideal. Recall Brahms’s complaint or fear of the Ventilhorn’s effects in the space of the Trio, of dynamic imbalance and loss of character; these gains we now read as self-evident were read as losses in the earlier reception of the new instrument overall, particularly through the first half of the century.

**Two Forms of Life**

Most instruments were subject to “improvements” in the nineteenth century, often to make the instruments more homogenous and more powerful within or against the expanding

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126 Goehr, *Imaginary Museum*, 24; the notion of retrievability is from Goodman, cited in Ibid. For more on the language of scores, see Ibid., 24–30.
forces of the orchestra and literal growth of the concert halls in (and audiences to) which they played. The piano grew in range and overall size to better serve as a *concertante* instrument against the orchestra or as a substitute for its expanded forces in color, range, and volume. Theodor Boehm introduced a shift in the flute’s interface that used complex keywork to build a flute less determined by the shape of the player’s hand; the historically delicate instrument became more dynamically powerful and, crucially here, more homogenous and tempered throughout its range. Additionally, new instruments proliferated widely in the nineteenth century: new aerophones included not only the valved horn, but the cornet, the valved trumpet and trombone, the euphonium, the (keyed) ophicleide and the (valved) tuba, as well as the saxophone family and its labrophone counterpart, the saxhorns and the related Wagner tuba. These would, by the end of the long nineteenth century, winnow down into the standard instrumentation that persist to this day in our holdover ensembles: the orchestra, the military wind band, and the brass ensemble.

For a time, the Waldhorn and Ventilhorn lived side by side as two forms of life within the orchestral map of mediations, within the ensembles themselves and the new treatises on orchestration that dictated its operations. At first the provenance of travelling horn duos such as the Lewy brothers—Joseph Rudolphe and Eduard Constantin—in the 1820s, the valved instrument was likely first taken into the orchestra by cor basso players since their range was shaped more by the irregularity of the harmonic series. (For example, the prominent fourth horn solo in the fourth movement of Beethoven’s Ninth Symphony is absolutely possible on the hand horn, but it is not out of the realm of possibly that E. C. Lewy opted to use his valved instrument for the Choral Symphony’s premiere in 1824 Vienna.\(^\text{127}\) Berlioz gave the Waldhorn (“the horn,”

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cor or cor simple) and Ventilhorn (“the piston or cylinder horn,” cor à pistons, cor à cylindres, or cor chromatique) separate entries in his orchestration treatise, and wrote parts for a pair of each in works such as the Symphonie Fantastique, as did Schumann in his symphonies. Generally, however, most composers writing in the 1820s and 30s continued to write with the Waldhorn in mind, since they could not be sure of which instrument would be available for a given performance or because they preferred the older instrument. Such works include Schubert’s symphonies, octet, and the art song Auf dem Strom (1828), Weber’s sylvan Der Freischütz (1821) and the supernatural Oberon (1826), and Mendelssohn’s incidental music to A Midsummer Night’s Dream (1826 and 1840, including the “Nocturne,” an extended solo for hand horn in cantabile style). As I have argued, already freed from “the fetters of the harmonic series” through hand horn technique, the horn was freed from a singular association with the hunt or vague heroism into the wider dramatic and narrative representation of the sylvan, the mystical, the pastoral.

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128 Berlioz wrote that “This [valve] system is especially useful for second horns in view of the many gaps it fills between their low open notes up from low C, but the tone of the piston horn is a little different from that of the usual horn; it would not do to substitute it on any occasion. In my opinion it should be treated rather as a special instrument whose particular feature is the provision of a good strong, agile bass line though without the force of the tenor trombone’s low notes, which its own low notes closely resemble. It is also good at taking a melody, especially if it is set mostly in the middle range” (in Berlioz’s Orchestration Treatise, trans. Hugh MacDonald, 181; emphasis mine).

129 Auf dem Strom was written for performance by J. R. Lewy at Schubert’s only akademie on January 28, 1828; as such, it may have been performed on a valved instrument. Nonetheless, it is performable on the Waldhorn (it would have been unmarketable otherwise), though it pushes the limits of the technicity much in the manner of Brahms’s later Trio.

De Souza (Music at Hand, 157–9) notes the uncanniness of the horns in the Wolf’s Glen scene in Der Freischütz; the supernatural effect of an entirely open-toned diminished seventh chord in the horn section is, as above, made possible by mixing natural horns of several keys.

130 Surprisingly, Monelle misattributes these new associations to the invention of valve technology, not the hand (The Musical Topic, 84). Of Oberon’s horn, he writes: “It would seem that the magic horn was an oliphant, made from an elephant’s tusk, the most expensive kind of medieval signaling horn. But for all its great value, it would have sounded just a single note. Nevertheless, its ‘Süssen hell Geklinge’ resounds through many ravishing orchestral melodies, played on a brass horn with a complex valve system” (Ibid, 106, emphasis added). Oberon was written so as to be executable on Waldhorn: it would have been all but impossible to expect valved horns in 1826 London, and,
Even once valved horns were more readily available, manufacturers in France also developed a *sauterelle*, a valve section that could be added to (and removed from) the corpus of the simple horn, thus demonstrating a technology through which the instruments could easily co-habitate. Similarly, while the Paris Conservatoire added a valve horn class in the 1830s with the appointment of Joseph Émile Meifred, the pedagogue’s approach to the valved instrument was a kind of middle path: Meifred advocated that hand technique should still be used on leading tones because of the special coloring they provide.\(^{131}\) J. R. Lewy published a set of études that demonstrate a mixed approach that uses the valves both chromatically—as Stölzel envisioned—and as a kind of quick crooking system that would change the nominal pitch of the horn and upon which the hornist would then use hand technique for any notes falling outside the harmonic series; the Lewy études demand that a hornist become fluent in both approaches.\(^{132}\) It was this latter “quick-crook” approach to the horn that Wagner adopted for *Lohengrin* (1850) which explains the sudden changes of key, especially in the Prelude to the third act.\(^{133}\)

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\(^{132}\) While J. R. Lewy published no official method, the technique is demonstrated in his *Douze Études Pour Le Cor Chromatique et Le Cor Simple* (Leipzig: Breitkopf und Härtel, 1850). See also John Q. Ericson, “Joseph Rudolphe Lewy and Valved Horn Technique in Germany, 1837-1851,” *The Horn Call Annual* 9 (1997): 23–35.

\(^{133}\) These “middle paths” could also be understood as exemplars of what de Souza terms “instrumental sabotage.” We will return to this idea in the next two chapters. See also W. F. H. Blandford, “Studies on the Horn. II. Wagner and the Horn Parts of Lohengrin (Continued),” *The Musical Times* 63 (October 1, 1922): 693–697.
The first large work to call explicitly and only for valved horn within the polity was Halevy’s opera *La Juive* (1835), and the first solo masterworks that require the valved horn were Schumann’s *Adagio and Allegro* for horn and piano and the *Konzertstück* for four horns and orchestra of 1849. Yet with the ossification of the canon underway, Austro-German horn pedagogues in the second half of the century such as Henri Kling, Friedrich Gumpert, and Oscar Franz would continue to teach the concepts behind this older instrument in their tutors and lessons for the remainder of the century.\(^\text{134}\) Gumpert—the hornist who “could not be convinced to try a Waldhorn” for the Leipzig premiere of the Trio—preferred instruments that could still be terminally crooked into the appropriate keys for the older repertoire, and insisted that his students learn Mendelssohn’s “Nocturne” with hand technique, if not explicitly advocating for its use in performance.\(^\text{135}\)

Largely, however, after mid-century the Ventilhorn would be the standard, including in Wagner’s later operas such as *Tristan und Isolde*, where the horns are given special attention in the preface, and for later composers such as Richard Strauss and Anton Bruckner, who draw liberally upon the memories of the older instruments for the play of topic but nonetheless require the modern valved ones—with full chromaticism and powerful sound—to retain standing in the


\(^{135}\) See the brief memorial to Gumpert, penned by his student Anton Horner, “A Letter from Anton Horner,” *The Horn Call* 23, no. 2 (April 1986): 91–93.

There were in Austro-Germany a few conservative organizations that, through the beginning of the twentieth century, continued to use the older horns for the older repertoire; see Scott, “Brahms and the Orchestral Horn,” 126.
Valved horns would settle into the principal length of F—bright enough to be heard within the expanded forces and concert halls while still retaining characteristic sound. As the century progressed, some hornists set the fundamental even higher—up to B-flat alto—in order to afford higher pitches more easily. This is the case both with the increasing range demands of contemporary repertoire, but also the older masterworks: Beethoven’s Symphony No. 7, which calls for horn in A, is treacherously difficult on an F length horn. Similarly, high passagework for a longer instrument could be “transposed” onto a shorter crook, which eases its production. The valves could, of course, do the work of filling in the compass downward.

As such, Brahms’s call for the Waldhorn in E-flat in the Trio could be read as old-fashioned, yet another example of his musical conservativism. Similarly, Moseley describes the binary that often that adheres in the digital analogy: “Digitality became a far-reaching principle governing the rational operations of distinguishing, ordering, and calculating, while the analog assumed the role of the digital’s ‘other,’ serving as complement, antithesis, outmoded paradigm, or bastion of resistance.”

The Valve’s Technicities of Dis-Embodiment

Most commentators have set upon two reasons for initial resistance to the “improvements” upon the Waldhorn. First, early valve designs may have been found lacking: the sharp bends and cylindrical tubing used in early valve designs presented—and in some ways continue to present—acoustic and intonation problems, especially on the narrow bored, conical

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136 While the valve horn was used throughout France, it would not become the principal instrument at the Paris Conservatoire until 1903. Ravel included parts for *cor simple* (natural horn) in several of his scores, including the solo horn in his 1910 orchestration of the *Prelude pour un infante défunte*.

137 Both Kling and Gumpert advocate for retention of crooks on valve horn for these reasons.

horn, and the mechanisms may have been somewhat noisy. Second, players may have resisted learning the new technique; indeed, Stölzel applied for an extension on his ten-year patent in August 1827 based upon the claim that “most brass players were used to playing on the old instruments and did not want to submit themselves to the drill necessary to learn to handle the new device that makes the instruments chromatic.” Composers, too, needed time to “get acquainted with the great advantages and possibilities of them, so as to be able to use them adequately.”

Valves, Stölzel reported, “have only now met with general approval and are being used more here and there.”

The issue that came to the fore in the 1840s, however, was that commentators prized the sound of the “beautiful, romantic lamentative Waldhorn,” the “sweetly melting tones” or the “strangely horrible” yet desirable effects made through the alternation of open and stopped sounds and variety of timbral colors. Simon Sechter, writing in 1844, summarizes the conservative position in the debate and, moreover, acknowledges the dynamic force of the keyboard interface upon instrumental technique.

As there is little denying that some deficiency of the natural Waldhorn is remedied by the chromatic Waldhorn, so there is little denying that the artificially produced tones of the chromatic Waldhorn are inferior by far to those of the natural Waldhorn in strength and freshness…. It appears that one wants to make all instruments play like keyboards, which is not as big a gain as one imagines…. Thus where brash noise belongs, we want to use the chromatic instruments, but for beautiful natural tones, there we want to use the older horns; to the profit of the ear, the [older horns] have to pause occasionally.

140 Ibid.

For other listeners, the valved horn’s fluency in the lower register in particular made the horn into a kind of cello or bassoon.\textsuperscript{143} It is anecdotal among hornists that Brahms once referred to the Ventilhorn as a \textit{Blechbratsche}, a “brass viola”; if this were the case, it is less a slight in the vein of the modern “viola joke” than an indication that the Ventilhorn’s musical fluency dulled the horn’s special character.\textsuperscript{144} Indeed, apparently some hornists removed their hand from the bell of the instrument entirely since it was not needed to produce the melodies—\textit{with disastrous effects on the instrument’s intonation, security, and of course timbre: the Romantic horn would no longer have the technology that endeared it to the romantics in the first place.} \textsuperscript{145}


\textsuperscript{144} The quote can only be traced to Kurt Janetzky, “Vom Signal bis zum Konzertstück,” \textit{Das Orchester: Zeitschrift für Orchesterkultur und Rundfunk-Chorwesen} 45, no. 2 (1977): 21, without citation; regardless, the anecdote has picked up currency in the horn world.

\textsuperscript{145} In his \textit{Hornschule} (76), Kling wrote: “The position of the right hand in the bell of the instrument should be regulated strictly in accordance with the instructions contained in this ‘School,’ albeit by the great majority of hornists in the present day this important particular is entirely ignored—one of the reasons, indeed, for the increasing scarcity of competent horn players.

Some time since, I happened upon the following passage in a ‘Method for the Horn’—‘In the case of the Ventil Horn, the right hand performs another function, the three middle fingers being employed in manipulating the valves, while the hand is only placed in the bell of the instrument when a tone requires to be stopped.’

Such a procedure must indeed be productive of some rather singular ‘virtuosity’ in horn-playing. It may be asserted, with some confidence, that the author of this ‘Method’(!) has in all probability never held a horn in his hand, or been within measurable distance of playing it.

The accuracy of tone-production, as well as the proper holding of the hand in the bell of the instrument, impart to the horn its distinctive charm, which consists of a truly melodious and sympathetic tone.”
As we observed in the case of Schumann and Beethoven’s use of the horn fifth, topic and theme are the crucial sites of “timbral transferability”—where the transfer of *significance* from composer to listener can become detached from the specific instrumental *signifier*.146 Yet in the recent *Oxford Handbook of Topic Theory*, three fortepianists demonstrate how the signifying instrumentalist—the performer assemblage, her body and her instruments—can affect the perception and performance of a topical signified, acting as a crucial intermediary in this transfer of significance from composer to listener.147 In both of their contributions, Tom Beghin and Sheila Guymer emphasize the role of the performer and, crucially, the appropriate instrument in the rhetorical *pronunciato* or elocation of topical figures. Beghin describes how, in performance of a Mozart sonata on two different fortepianos (Mozart’s Walter and a replica of an 1808 Nannette Streicher, a later, larger instrument), the performer’s experience of topic shifts, to the point of questioning their apparent legibility—or audibility—across instrumental difference.148 He describes that, on the later instrument, “there is more homogeneity but, then, also more contrast,” with the effect that “whereas in scenario one [at Mozart’s Walter] there are subtle shades of light and shadow throughout, in scenario two [at the Streicher] first there is shadow, then there is light.”149 The priorities of homogeneity and binary contrast are, I observe, similar to

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149 Ibid., 558.
those affordances of the later Ventilhorn; the sense of shading afforded by Mozart’s instrument as described by Beghin is reminiscent of timbral colors of the Waldhorn. “What are we to do with all the stories we hear about valves and keys?” one commentator wrote in 1837.\textsuperscript{150} “They ruin the natural characteristic tone and make it so that soon we will have only yellow and red, with which we can no longer fittingly paint and shade.”\textsuperscript{151}

In a perspective that prefigures these interventions from the modern historical performance movement, J. B. Gleich, writing in 1853, took issue with the Ventilhorn’s instrument’s fitness as a site of musical re-creation for repertoire written for the Waldhorn: he held the opinion that the performance of Beethoven and Weber’s works on the valved instrument was “vandalismus.”\textsuperscript{152} We have observed, for example, how Beethoven demonstrates the value of the horn’s open timbre in the first movement of the \textit{Eroica}—enough to ask the first hornist to make a rare and time-consuming crook change—but we have also observed his nuanced application of hand technique to sublime effect in the fugato section of that movement. While late Enlightenment rhetorical ideals in solo repertoire are, perhaps, less forceful when applied to Brahms’s mid-Romantic chamber music space, their emphasis on sonic delivery and performance carries implication for the obvious audible technicity—the pronunciation, action, or writing of the hand—upon the Waldhorn.

Let us return to the horn fifth in the Trio and examine the effects of its recreation on the Ventilhorn.


\textsuperscript{151} Ibid.

\textsuperscript{152} Ferdinand Gleich, \textit{Handbuch der modernen Instrumentirung für Orchester und Militairmusikcorps} (Leipzig, 1853), 31; cited in Scott, “Brahms and the Orchestral Horn,” 126.
Example 1.8. III. Adagio mesto, mm. 59–65, violin and horn in E-flat (as executed on Ventilhorn in E-flat and in F)\textsuperscript{153}

We have already discussed (ex. 2.5, above) how both the violinist and the hornist possess the affordances to sound the melodic content of the horn fifth gesture in E-flat.\textsuperscript{154} Moreover, we observed how, as the gesture pivots to a new key, the colleagues are better able to balance dynamically because of the Waldhorn’s technicities—the hand tubing that is required for the E-flat horn to sound again in F major—and also better able to effect the poetics of hornistic imagery. When executed on the Ventilhorn in E-flat, however, the hornist will by default play both of these statements on an open-sounding horn, though it will actually be a function of combining—through valve tubing—horns in E-flat (0, without valves), D-flat (valve 1), C (1 and 2), and D (2).\textsuperscript{155} Balance issues with the violinist, already present since the valved instrument is

\textsuperscript{153} I also include the F horn because it is the key to which the horn was standardized by the turn of the twentieth century.
\textsuperscript{154} Coincidentally, Brahms does not have the pianist sound the horn fifth; rather, the pianist’s music here comes from the second section of this movement, a figure initially introduced by the horn—with a fascinating alternation of open and closed tones—and echoed in counterpoint by the violin and piano in turn. At the topical level, this could be read to juxtapose “simple” (pastoral horn) and “learned” (fugal) styles; in the temporal flow the Trio however, this fugal figure—rather than the horn topic—may be the enactment of “memory.”
\textsuperscript{155} When performed on Ventilhorn in F, the combined horns are horn in F (0), horn in E-flat (1), and horn in D (1 and 2).
built to be louder than the natural one, are exacerbated without the shading provided by the Waldhornist’s hand technique. (These balance issues become yet more prevalent as the bell enlarged in order to radiate yet more sound, and the overall quality brightened as the instrument came to stand in F almost exclusively in the first half of the twentieth century.) The result is an issue in execution that, as John Irving has observed upon various keyboard instruments, “threaten[s]”—or at least makes harder to perceive—“the identity and meaning of a topic.” On the Waldhorn the sense of the horn becoming phantasmic memory is a function of execution that lends haziness and distance by layering timbral shift upon—or by virtue of—a harmonic one; on the Ventilhorn, the shift is merely harmonic. While the general topic may imply a simple horn sounding before or without the hand, the specific moment in the Trio gains elocutionary force by this coupling of timbre and gesture, hand and melody, vox and verba.

To articulate is both to state clearly, but also to join at a bend. The valve presented not only a technological intervention into the instrument, but also into the player: the brass player was re-articulated at the fingers. The newly digitized hand is a body re-formed, re-organized by music and its technologies—literally re-membered through mechanism. At the bending of the hornist’s fingers, it creates a joint where timbre and melody are, as Moseley describes with the keyboard interface and its action-sound coupling, in an “orthogonal relationship”—a right angle—to one another, separable. And the Waldhorn’s special manner of pronunciation—the

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157 Beghin (Ibid., 554) cites Forkel: “‘Repetition receives only then its highest value when it is paired with paronomasia (reinforcement), which does not repeat a phrase merely as it already was but with new, forceful additions.’ Forkel continues by saying that these ‘additions’ do not necessarily have to be understood as ‘additional tones’: sometimes, he writes, these “additions” can be materialized by ‘a stronger or weakened delivery’—an illustration of the fine line between elocutio and actio: the figure of paronomasia may be applied by mere voice (vox), without having to go through words (verba).”
timbral and dynamic shadings made by the audible bodily labor of the hand-tube, but illegible in
the score—is stripped away, dis-membered. The poetic diction of the body is detached from the
horn’s mode of melodic production, and ultimately forgotten to us.

As musical works came to be perceived as “discrete, perfectly formed, and completed
projects,” Goehr describes, “music soon acquired a kind of untouchability.” 158 The valved horn is
certainly more articulate—it can play music like many other instruments. But even though the
instrument can sound too loud or too opaque in certain contexts, as Brahms feared, from the
perspective of timbral re-embodiment it is in fact more transparent—zuhandenheit, more
“handy,” in Heidegger’s sense—than the Waldhorn and its attendant grain, concealing music’s
mere human labor and origins to “let the music speak for itself.”

“Sadly one cannot mistake the Zeitgeist in the introduction of [the valved horn],” wrote
one commentator in 1838. “Meanwhile, in passages here and there it is richer, but in general, this
only seems so. However, for the most part these are also passages that one would hear better on
the bassoon, the trombone, or the cello. But should we then keep no instrument that is actually
created totally for singing?” 159 These notions of voice and song return us to Barthes’s erotic
relation to the grain of the voice. Later in that essay, Barthes describes a preference for Charles
Panzéra’s lieder performance and its presence of grain, of throat, of body—for its
pronunciation—over Deitrich Fischer-Dieskau’s, which he describes as lungs, breath,
significance and dramatic articulation. 160 In other words, Barthes prefers Panzéra’s performance

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158 Imaginary Museum, 222.
for the presence of *his* musicking body rather than the wholly transparent presentation of the composer’s spirit.

The Ventilhorn’s gain—a self-sufficient horn that is less “restricted” by instrumental limitations, that can expansively reembody the composer’s voice with eternally open sounds, comes at the expense of the hornist, their body, their presence, and their voice. Under “the Beethoven paradigm,” music as an end came to deny its means. This evacuation or denial of the body is, as Davies traces, where Liszt (and Liszt scholarship) leave us: estranged from the body, performing beyond and in spite of it. Of Liszt’s hands, Davies notes, “Operating at the very threshold of the absolute, their very presence threatened not only the purity of the music but the truth of expression itself.”

The threat of the Waldhorn, though, is not the visual spectacle of the singular virtuoso’s diabolical body, but the audible touch of the hornist as it creates—or manufactures, where *manus* means “hand” and *factus* is “to make”—melody through its gestures. Through valve technicity, *homo factus* is replaced by *homo ludens*.

Digitized brass instruments—particularly the cornet (a valved bugle)—were adopted very quickly in military and vernacular settings for their ease of learning and durability, leading to the establishment and ascension of the military band and the brass band. (The horn in these ensembles was often replaced by an alto saxhorn, a shorter piston-valved instrument that was easier to learn.) These popular ensembles played not only original compositions in march and

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161 Davies, *Romantic Anatomies*, 176.
vernacular styles, but also transcriptions of major works from the art music repertoire—including Beethoven’s symphonies. Open air concerts on these fluent, more easily-mastered instruments were crucial, if often forgotten, sites of aesthetic education for the lower classes—as both audience and performer—throughout the nineteenth century, and certainly played a role in the continuation of the canon and “the imaginary museum of musical works.” A Beethoven symphony played by an orchestra, a military band, a piano, or an orchestral automaton would be, nonetheless, a Beethoven symphony—an ontologically stable object of study, a “work”—regardless of its particular embodiment.

The disembodied sounds made possible by the mechanization of the hornist reinforce—indeed, are part and parcel of—a larger musico-cultural shift toward the conceptual detachment of the material from music, such as evidenced by Romantic orchestral automatons that could reproduce the sounds of an entire orchestra dis-articulate “timbre” from “music,” or the stagecraft that made Wagner’s operas transcend the merely mundane. The play of melody—or topic or leitmotif—through the ensemble required management of members of the orchestral polity, a way of controlling and submerging their individual voices in favor of the composer’s voice. The composer-at-the-keyboard reaches through the valve’s operation; the player erupts fingers and the hornist’s melodic manufacture is mechanized and digitized, disembodied through reembodiment. Thus this transcendence of materiality was only made possible through technological mediation—spirit is only made accessible through matter, and through wide-reaching yet concealed programmatic relations between mechanical and fleshy bodies. I will return to this idea in the final chapter.

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163 Dolan, *Orchestra Revolution*; Kreuzer, *Curtain, Gong, Steam*. 
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Indeed, in the early twentieth century, some composers found great promise in mechanical music: in the case of recording, it preserves the ephemeral and, in the case of music composed directly for mechanical instruments, mechanical reproduction conserves, artefactuality, the transcendent work.\textsuperscript{164} “Why can’t music go out in the same way it comes into a man,” quipped Charles Ives, “without having to crawl over a fence of sounds, thoraxes, catguts, wire, wood and brass?”\textsuperscript{165} Music would ultimately find this liberation in the acousmatic sounds of music concrète and other experiments in electronic music, and the retreat of the composer away from public life into the academy.

Along with Davies’s romantic anatomies, Dolan’s automatons, or Kreuzer’s curtain, the valve is a romantic technology of transcendence that makes possible the idea of a more abstract, more absolute music—a technicity of Werktreue that reifies the notion that music exists autonomously from any particular body, instrument, or performance. The re-embodiment of the hornist affords aural invisibility for the instrumentalist, the ability to become a transparent medium; the composer’s voice becomes freed from dependence upon laboring bodies. Performance could meet the Werktreue ideal by achieving, at last, “complete transparency” that “allowed the work to ‘shine’ through and be heard in and for itself.”\textsuperscript{166} The valved horn enables the dismemberment of material from melody, renders the musicking body almost as inaudible as it was illegible, makes a music that is untouched. Our nostalgia for Brahms’s Waldhorn attaches to an image and not its creative sound.

\textsuperscript{165} Cited in Goehr, Imaginary Museum, 229.
Through an episteme of instruments that demands that sounding sources become invisible or transparent, Romantic technologies enable an aesthetic reduction that strips away material, form, technics, and praxis in pursuit of privileged meaning and content or sublime transcendence. Or, in the words of one pilgrim to Beyreuth, with Wagner’s stagecraft and hidden orchestra, an approach to music that “turned brass into gold.” Under what Barthes described as a “tyranny of signification,” a gnostic mode of listening, the simplicity of the horn fifth as an idiomatic, immanent gesture is dismembered into a “musical” one laden with transcendence, significance, farewell, and nostalgia for the mother—despite Brahms’s insistence that we do otherwise.

Rather than focusing on its disembodied poetics or semantics, remembering the hornist’s technicity reveals how, or simply that a shift in both instrumental and bodily technics played a part in music’s disembodiment in the nineteenth century. The valve provides a very local kind of technological enframing: instrumental labor is something we hear past to get at the meaning of the thing, and long before mechanical recording, music becomes something to be listened to or understood, something done but not quite made. Over time, we have accepted the Ventilhorn as an improved Waldhorn, or we have come to conceive of these instruments as interchangeable—a horn is a horn, or simply an idea of the horn—rather than hearing the differences between them. Now, we hear a horn but not the hornist, the instrument signifies before it is played, and we experience it only from a distance—or as distance itself—or we hear phantom horns more often than actual ones.

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Epilogue: Remembering Hand Technicity

After a while—and with the concerted efforts from some notable instrument makers and players—Berlioz no longer found a timbral difference between the natural and valved horns, but continued to claim that playing all tones open—one of the stated “improvements” of the valved instrument upon the natural one—was an “abuse,” for it undermined the intentions of the composer.168 “The fault,” however, “lies in the player and not in the instrument. Far from it,” Berlioz insists:

for in the hands of a skilful artist the cylinder horn not merely produces all the stopped notes which the natural horn produces but can actually play the entire compass without resorting to a single open note. The conclusion is simply that horn players should know the technique of hand-stopping as if the cylinder mechanism did not exist, and that composers should henceforth indicate the notes that are to be played stopped by some special sign, the player producing as open sounds only those notes which carry no such indication.169

Crucially here, Berlioz notes that the advantage of the valved horn is not merely its open tones, but that any tone could be played closed. Berlioz, then, is advocating for a techné that utilizes the full resources of the Ventilhornist—the technicities of the valve and the right hand. This know-how is, for Berlioz, assumed on the part of the composer and assigned to the conductor for his oversight at the grand keyboard.

By the time Wagner wrote Tristan und Isolde in 1865 (the same year Brahms wrote the Trio), composers had developed the gestopft symbol (+) to indicate those tones they wished to be produced closed, assuming that all others would be produced open on the Ventilhorn.170 For

168 Berlioz, “Travels in Germany,” Memoirs I, 7; cited in MacDonald, Berlioz’s Orchestration Treatise, 183; emphasis added.
169 Ibid., 183–4.
170 See the preface of Tristan und Isolde, where Wagner goes to some effort to explicate his writing for horns, and the use of the gestopft symbol.
modern hornists—and particularly for works in the Austro-German tradition—“stopping” means to fully occlude the bell and typically to play with a buzzy, marked coloring.¹⁷¹ Thus “stopping” the horn was dislocated into a distinct and separable effect of timbre, a singular color that could be switched on and off at the composer’s behest, like a stop on the organ or Berlioz’s great orchestra-keyboard; following Rosen, its sonority was “composed rather than realized,” a color painted onto music rather than the color painted by melody.¹⁷² The left hand’s new digital maneuvers ultimately stilled the right hand of the hornist into the neutral position; while modern hornists will still use the right hand for intonation and timbral effect qua “extended technique”, these parameters are conceptually detachable from larger “musical” concerns of melody and harmony where before they were inextricably bound together.¹⁷³

The modern hornist is trained on the valved horn with a nominal pitch in F and assumes the instrument’s always-already chromaticism. Thus, when we perform Brahms’s Trio, we sight-transpose the part, and our digitality even further removes us from Brahms’s ideated instrument in E-flat and the actual Waldhorn (ex. 2.9), regardless of whether it signifies Brahms’s childhood, a kind of poetic antiquity or anachronism, or, as hornist Richard Merewether suggests, an intellectualism of horn technique.¹⁷⁴

¹⁷¹ Because hand horn technique remained viable in France for much longer—thanks to the conservatism of the Conservatoire—French composers had a more nuanced approach: a hornist could bouché the horn without necessarily making a cuivré (brassy) sound, and the three-quarter closed timbral and dynamic effects were retained as son echo, or “echo horn” technique. Regardless, these techniques are applied to the valved horn’s melody rather than an immanent function of them upon the hand horn.
¹⁷³ Szendy, Phantom Limbs, 91, speaking of the gramophone: “What instrument in the service of an all too human music would have ever opened the door to an entropy of bodies?”
¹⁷⁴ cited in Humphries, The Early Horn, 103.
This distance is compounded yet further when modern hornists perform the Trio on their “double horns,” instruments that stand in both F and, by means of a valve activated by the thumb (T), in B-flat a fourth higher. The instruments were developed as a collaboration between master hornmaker Edward Kruspe and Freidrich Gumpert’s nephew Edmund at the turn of the twentieth century as a means of maintaining the F horn’s characteristic timbre while also being able to use the shorter B-flat horn’s playability in the high register, though the sound can be brighter and thinner. For our purposes here, observe that the double hornist works in a smaller range of partials, but uses the fingers more.

From the pragmatic perspective, however, the most successful performances of the work on the large, modern, valved instrument employ a modicum of the older hand technique in certain passages. For the flexible hand remains a technicity available to valved hornists—as early valved hornist Meifred and even later teachers, including Gumpert, showed—even if it has been made somewhat redundant by technology, forgotten by history, evacuated from organology, or illegible to analysis. We hear this particular color today when hornists opt to stop the third to last and last notes of this movement—these written E-flats would have to be covered on the
Waldhorn, but can also be covered on the Ventilhorn to match the stridency of the violinist’s double stop (ex. 2.10, m. 83).

Moreover, following Berlioz’s observation, a valved hornist can produce the earlier F major horn fifth entirely “closed”—fairly covered but not necessarily brassy—if the hornist knows to read for it, and—as Brahms predicted—even the greatest players struggle with balance if they do not. And the effect is poetic and beautiful, if the listener attends to and values the difference.

Brahms asks all of us to remember this.
CHAPTER THREE

TOUCHING VOICES in MESSIAEN’S “APPEL INTERSTELLAIRE”

In this chapter, I closely examine the work of the body in musicking, remembering that music is always a performed, performing art and a choreography of the instrumentalist’s materials. In contrast to my previous focus on the variable and shifting morphologies and bodily technologies of the hornist—as observed in Beethoven’s *Eroica* and Brahms’s Trio—I must return to that which has stayed—in the most basic ways—the same for hornists across time, particular instrument, and repertoire. For I still have not devoted adequate attention to the “essential acoustic factor” of 423 aerophones, that which identifies them as *labrosones*: the lips. More accurately, the focus is the *embouchure*, the playing-specific organization of facial tissues surrounding and including the player’s lips. The embouchure is the source of the hornist’s sound and her identity as hornist; in other words, without the player’s lips, a horn has no voice of which to speak.

**Finding Your Embouchure**

At issue in both voice and labrosone pedagogy in particular is the invisibility or illegibility of the sounding mechanism: the vocal folds are tucked into the larynx in the former, where in the latter the lips are hidden behind and inside the opaque mouthpiece, and neither can be removed for easy inspection and comparison, nor purchased nor replaced. To recall David Burrows’s instrumentality from the introduction, while I may “reject”—or, more accurately, repurpose—“the resources of the interior of the body used by a singer in favor of an interaction with an object outside” myself, the horn’s shaping of my breath is hardly in “full view of anyone
who cares to watch.”¹ I can share my horn or my mouthpiece, give it to you as an object for your interaction, but I cannot share my *soma* in the same way.

You likely have a sense of what it is to vocally sing—that is, to use the vocal folds to produce music—or to speak. You may also be able to whistle: to use your lips to cut a stream of air, as a flute. Few, however, will have great familiarity with the musical potential of their vibrating lips.² Hence I offer these exercises, where I will draw upon your vocal tract’s knowledge of the mechanics of speech and your face’s styles and habits of non-verbal communication, but draw your attention to un- or under-explored potentials for labrosonic sounding, for *labrosonification*.

An embouchure proper ultimately requires a practiced coupling of flesh and bone, metal and air, and the characteristic sound of the hornist only arises in the geometries where lip-reeds meet instrument, when the activation of the lips is coupled with the air in the tube to produce the profile of overtones that we recognize as belonging to the horn—or the hornist—and when the embouchure is met with the horn’s particular affordances, resonances, and resistances. For the moment, however, we are concerned with the formation of the lip-reed “itself” before it is coupled with the instrument. This is partly pragmatic, as I do not imagine that you readily have a horn or mouthpiece available upon which to experiment. Focus is rather upon the affordances and techniques of bodily material for different sounding. By bringing it into our attention, *Vorhandenheit*, we make it—its surfaces, actions, and potential musical affordances, its organization, a latent instrumentality before it meets the bounded instrument—available for our

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² We might consider that babble and tongue-twisters might constitute a kind of ludolinguistics.
perception. Borrowing from Nina Sun Eidsheim, I hope to show that the lips are, like the vocal folds, another possible corporeal interface that sonorizes bodily activity.\(^3\)

Through an experimental approach to speech and facial non-verbal communication—highly refined affordances of the human mouth, shaped by the need to communicate and to relate sonically and visually to one another—I can make my body known to you, and your bodily instrument to yourself. The point is that you, too, have a playful mouth, a lip-reed waiting to be formed, through which you might be able to sing without the use of your vocal cords. As David Sudnow describes in the *Book of the Hand*, “a music-making body is being fashioned,” or perhaps more accurately: the awesome birth of sonification, a new “voice.”\(^4\)

**ORIENTATION EXERCISES: From Voice to Labrosonics**\(^5\)

*for the general idea*

- Imagine you are blowing out a candle. *Do* blow out a candle.

  Reflect: For efficiency, you likely didn’t just breathe out on the candle; you *blew* it. In order to direct the breath into a puff or stream of air, you’ve likely taken in a deeper breath. As you approach fullness or readiness, you’ve organized your mouth and lips into a kind of nozzle to create a stream of air, control the flow, and to give it direction. The nozzle is your lips, built upon the corners of your mouth that you use to make a smile. The opening in the nozzle is likely at the center of your lips, and is relatively relaxed. As you blow out the candle, you’ve pressurized the exhalation at the abdomen, giving the air more velocity.

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\(^3\) In *Body Music*, a collaboratively-developed experimental work for vocalist, Nina Sun Eidsheim develops a radical project of sonifying the voluntary and involuntary processes of singing which do not rely on the vocal cords. “In doing so, we hope to show that the vocal cords are only one possible interface that sonorizes overall bodily activity of singing and the corporeal changes it causes” (Nina Sun Eidsheim, *Sensing Sound: Singing and Listening as Vibrational Practice* [Durham: Duke University Press, 2015], 112; emphasis added).


\(^5\) This section was directly inspired by the exercises included in Tomie Hahn’s monograph *Sensational Knowledge: Embodying Culture through Japanese Dance* (Middletown, CT: Wesleyan University Press, 2007).
for the musculature of the face

- Smile with lips closed over the teeth, and notice how your lips are strung between the corners of your mouth. Observe how they stretch laterally across the teeth.

- Now purse your lips, making a "duck face." Notice how your lips are gathered and pushed outward by the muscles surrounding the lips, and the cheeks suck in.

Neither of these are quite it, because the embouchure is a muscular tug-of-war—an intimate corps à corps—a pulling of larger muscles used when smiling and chewing balancing and supporting a gathering of the muscles and tissues surrounding the lip. The center of the lips is actually quite relaxed, like an empty hammock strung between two trees.

- Make the duck face and flatten it by bringing your lips directly back toward your teeth, maintaining the tension in the cheek muscles.

- Alternatively, lightly smile with lips closed over teeth. Keeping the cheek muscles activated, even intensifying that sensation, begin to purse the center of your lips.

setting up for buzzing

- Allow the mouth to relax, the lips naturally closed. Say mmm. Notice the tickle in your lips.

- Say the morpheme pruh.

- Prepare to say pruh, or imagine saying it.
  - Notice the slight sensation of tension at the corners of the mouth, but that the center of the lips remains closed, relaxed and natural. As you phonate pruh, notice how the lips blow open, creating an opening in the nozzle, an aperture.

- Prepare to say pruh, but instead of voicing, blow air through the lips while maintaining the musculature.
- Say *ppppppppprrr*, a particularly sustained first complex phoneme of *pruh*. Prepare to say *pppprrrrrr*, but instead of voicing, blow a sustained stream of air through the lips while maintaining the face’s musculature. The lips will open and close in a cyclic pattern, giving rise to a kind of raspberry.

- Repeat, and, thinking back to the smiling corners, intensify the sensation at the corner of the lips. You may notice a higher, definite pitch.

- Afterward, blow a sustained raspberry, as loose lipped as you like. Open your mouth wide, stretching out the cheek and lip-support muscles. Relax your face.

*a free buzz with single lip reed*

- Place your top lip over your bottom lip, the top covering the bottom. Tighten the corners. Blow pressurized air. You might get a high pitch from the buzz created at the center of your top lip, which is working like a single mechanical reed. You’ll notice your lips tickle wildly afterward—this is a common sensation for new labrosonists.

*the organized double-lip-reed embouchure*

- Say *mmmm*. Say *p——*. (labial consonants) Say *fff*.

- Blow air through *fff* lips, noticing the small opening, the aperture, at the center of your lips.\(^6\)

- Say *symphony*, focusing upon the *mph* (*ɱ*, labionasal dental complex).

- Mouth *symphony*, halting on the *mph*. Tighten the muscles of this embouchure and blow focused air through the lips, remembering the feeling of the aperture.

- A trained buzz, a horn-coupling double-lip-reed buzz, exists between the actions of these three phonemes.

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\(^6\) Note that in brass playing proper, the teeth are placed fully behind the lips, unlike as implied by the *f*; however, the labio-dental fricative here is useful to (1) remind the reader of the teeth, the placement of which is crucial and an important aspect of embouchure infrastructure, as well as (2) to provide a means of friction by which to start a free buzz more successfully.
mmm—ppp—fff
mmm—fff—ppp
ppp—fff—mmm

(Do not be frustrated if you can’t get a consistent buzz going.)

- You may find it easier to use a point of resistance to organize around. Make your index finger and thumb into a circle the size of a quarter and use it like a mouthpiece rim against your embouchure; alternatively, use a (rinsed) soap bubble wand or a keyring.

*for tongue placement and articulation*

- Whistle, if you can.
  
  While you are technically playing your lips as if they were an edge, like a flute, this is also excellent tongue placement for playing brass instruments.

- Slide up and down in pitch; you’ll notice your tongue raises and lowers in the back.

- Imagine you have a small seed stuck at the very opening of the nozzle. Use just the tip of your tongue to push it away.

- Say the following morphemes, and then again without phonation at the vocal folds, focusing on the action of the tip and back of the tongue.\(^7\) You may notice that the tongue muscle has become articulated into two planes: a tip (responsible for consonants; it should act as a valve) and a back (for vowels, for shaping the mouth cavity for air speed, resonance, and color).

  If you can whistle, attempt the following morphemic action (without phonating at the vocal cords) while whistling:

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\(^7\) In his *Horn Playing from the Inside Out*, Eli Epstein codifies the specific pitches on the horn to which these morphemes apply, which will be discussed later. *Eli Epstein, Horn Playing from the inside out: A Method for All Brass Musicians* (Eli Epstein Productions, 2012).
- *tuh tuh tuh*. This is for medium low sounds.
- *tah tah tah*. For medium high pitches.
- *tee tee tee*. For high pitches.
- *thoe thoeh thoeh*, pushing the seed away from the lips. This vowel encourages a rich, dark sound for low pitches.
- *tee-uh tee-uh*, for descending slurs.
- *tah-ee tah-ee*, for ascending.

Through these familiarizing exercises—no less through reflection upon other familiar experiences of the bodily substrate of sounding—we can recognize Eidsheim’s observation that “musical sonority” becomes, for the singer as for the instrumentalist, “practices of the flesh.”[^8]

The singer’s work—and to no small extent, the hornist’s—is built from flesh upon flesh, articulating an instrument from the possibilities and affordances the body offers forth, the musician discovering their instrument in much the manner that the infant discovers their *soma*’s capacities for sounding (*echos*) before they are domesticated into language, into *logos*.[^9]

Horn playing is, like the singer’s instrument or the baby’s babble, comprised of a large “internal corporeal choreography” of *soma* that utilizes—even technologizes—one of the possible sonorous interfaces of the body.[^10] For the moment, I will continue with focus not on the *labrosone*, but on *labrosonification*, where lips touch each other to sound, to speak.

[^8]: *Sensing Sound*, 127. She is here recounting St. Augustine’s experiences of music, which anticipated the Cartesian mind-body problem—taken up in Cusick—in elucidating the danger of sonority, mere sensation, and pleasure (*echos* and *soma*) with the “experience of beneficent effect” of the text (*logos*) (in Ibid, 126).

[^9]: Eidsheim discusses this phenomenon in *Sensing Sound*, 120–5; we will return to this, below.

“Who”—or What—“is Speaking?,” or “Why Voice Now?”

The work under investigation is for solo horn: the “Appel interstellaire” by Olivier Messiaen. The solo is an entire movement drawn from a larger tone poem, Des Canyons aux étoiles..., a work for chamber orchestra and various soloists written by the French composer from 1971–1974. Des Canyons was commissioned by Alice Tully in late 1970 to commemorate the American Bicentennial, and the French composer chose for his subject what he deemed to be the most beautiful place in America: Zion and Bryce Canyons in southeastern Utah. The resulting work—including the solo—typifies Messiaen’s astronomical, ornithological, theological preoccupations, grounding them with a specifically geographic, geological focus—and, of course, his distinctive compositional voice. But I turn here to the genre of the solo work because it is where I am anticipated in this examination of the topographies of the body by my musicological predecessors. A hornist is most often heard in ensemble, submerged in the orchestra or among the distributed agencies within the chamber space, while a solo is a musical performance in which the composer’s voice is enacted by a single performer; under Cone’s formulation, we are thus able to assume a singular, unitary agency in the sounding of a complete musical persona. That is, the soloist can identify most explicitly with the complete musical persona and the composer’s voice.¹¹

Cone began: “If music is a language, then who is speaking?”¹² When this question is applied to the voice and lips of the horn—or hornist—it resonates with Luce Irigaray’s insistent

¹¹ Unlike that of the piano, for example, the horn’s solo repertoire is largely a specialist repertoire, designed for pedagogy and occasion rather than repeated public performance. In this, Messiaen’s solo is an exceptional work—or part of a work.

formulation of the bodily source of language: “To articulate one precise word, our lips would have to separate and be distant from each other. Between them, one word,” she writes.\textsuperscript{13}  

But where would such a word come from? A word correct, enclosed, wrapped around its meaning? Without a crack, faultless. ‘You.’ ‘Me.’… Without an opening, that would no longer be you or me. Without lips, it is no longer us. The unity, truth, and propriety of words comes from their lack of lips, their forgetting of lips. Words are mute, when they have been uttered once and for all, neatly tied up so that their sense—their blood—can’t escape.\textsuperscript{14}  

Who is speaking? Cone’s attention is upon the logocentric source of music and its embodiment in virtual agents as the composer’s voice. I am rather more interested in how we return voice to bodies—the always-already bodily substrate of all sound, including music—the actual agents that give \textit{him} or \textit{it} presence, my lips that make the horn sing.  

As part of the performative turn in musicology, largely inaugurated by feminist and queer studies, the disembodied “voices” of music were finally returned to bodies, and, as Martha Feldman notes in her introduction to the recent colloquy “Why Voice Now?” the concept of voice was made three-dimensional, fleshy, and flexible, and available to musicology.\textsuperscript{15} But “voice” as a concept is also used in a dizzying array of philosophical, psychoanalytical, and political contexts, far beyond the bounds of music or even of aural sound more broadly. In the same colloquy, Brian Kane posits a diagnostic model to analyze how “voice” is invoked and to what ends.\textsuperscript{16} In this model, the seemingly singular object of voice, or \textit{phoné}, is distributed  

\textsuperscript{14} Ibid.  
between *logos* (signification, particularly language, what the voice is ‘saying’), *echos* (sound, such as timbre), and *topos or soma* (site of emission, how voice ‘says’).\textsuperscript{17} Different approaches to voice or vocalic objects move between these sites, emphasizing some and reducing others, and posit different lines of questioning, or else particular questions drive focus upon certain elements. For example, animal vocality—such as birdsong or whale “song”—probes at the space between *logos* and *echos*, namely: do the sounds heard signify a consciousness or intentional musicality, or a language, and what is the boundary between those organized sounds, us, and them?\textsuperscript{18}

We might thus model Cone’s attention to music as the embodiment of the composer’s voice (*phoné*) as also chiefly located between *echos* and *logos*, but in this instance *logos* is understood in all cases to be a humanly-sourced musical consciousness. *Topos* is generally, though certainly not entirely, reduced under attention to the composer’s voice: while the musician—or, rather, the musician-cum-instrument—is the source of *echos*, Cone’s formulation insists that to which we attend is the *sound* of the instrument, not the instrument as object or actual player herself as the source of emission (*topos or soma*). By contrast, performance-based approaches have tended to locate musical “voice” in sounding and bodily realms. In this vein, I will focus here on the *somatic* location and actions of the hornist’s sounding (*echos*), deferring *logos*.

\textsuperscript{17} Kane argues for the term *topos* over *soma* as a function of his work on acousmatic sound.
\textsuperscript{18} Kane, “Model Voice,” 674. In his “Phenomenology of the Voice,” Don Ihde considers the phenomenon of whale song and the domesticating structure of language that we humans place upon it by calling it “song” in the first place. In Kane’s model, this would reflect a different relationship of *logos* to *echos*, namely the interpretation of the whale’s sounding (*echos*) through human *logos* (which names it “song”); in Don Ihde, *Listening and Voice: Phenomenologies of Sound*, 2nd ed. (Albany: State University of New York Press, 2007), 186–7.
Why voice here, why now? Feldman argues that, against musicology’s high modernist focus upon the two-dimensional score (logos), Cone’s “dramatistic” approach was exceptional in its attention to the work as a sounding projection (echos) of the composer’s voice, enabled by the technology of the written score but certainly not reducible to it. As the sonic embodiment of logos, voice is a material phenomenon that places us into relation with one another, by which I can make myself understood to you, by which we can bridge the gap between me and you. Cone recognizes this, too, explaining the allure of the human voice and our erotic inclination toward it: “As human beings, we recognize the voice as belonging to one of us, and we accord it special attention.” Comparing the distributed labor of performance in art song, Cone notes that, against the pianist’s virtual agency, reduced to their sound, “only the vocal persona can be thought of as ‘incarnate,’ since it is the only one that expresses itself fully through the human voice.” That is, the echos of the vocal persona is lodged in the body that houses that instrument, and only here does lived soma return to Cone’s phoné.

While attention to voice can manifest in exclusive attunement to logos, Cone assigns the human voice, a “natural supremacy, more than its ability to verbalize. For, as we have seen, words are not necessary so long as the voice is there.” This is echoed in Barthes’s grain, an erotic attention to the sounded “disclosures of topos.” In other words, the voice can—or does—signal or signify a body—a human body—before it signifies anything else. “A voice means this,” Calvino’s king auto-narrated, “there is a living person, throat, chest, feelings, who sends into the

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20 Composer’s Voice, 78.
21 Ibid., 18. Coincidentally—given Messiaen’s devout Catholicism—I will mention that Cone is here making comparison to the Holy Trinity, where the vocalist is Son (since incarnate), the instrumentalist and his virtual agents, the Holy Ghost (since it speaks directly to us with the mediation of the Word), and the Father is the complete musical persona or composer’s voice.
22 Cone, Composer’s Voice, 78.
23 “Disclosure of topos” is from Kane, “Model Voice,” 676.
air this voice, different from all other voices. A voice involves the throat, saliva, infancy, the patina of experienced life, the mind’s intentions, the pleasure of giving a personal form to sound waves.”

For the King, the significance of voice is the sounding of the body.

For, as Calvino’s king reflects, we have a relationship to the voice as to no other form of sounding: by locating the sounding voice as inextricably bound up with soma, I have a voice—like I have a body—in a way in which I have no other thing in the world. “I am incomparable; my voice is bound to the mass of my own life as is the voice of no one else,” writes phenomenologist Maurice Merleau-Ponty. And so, emerging from my bounded integument, my fleshy envelope, my voice signals the uniqueness of my body, a unique presence in and to the world. “But if I am close enough to the other who speaks,” Merleau-Ponty continues, “to hear his breath and feel his effervescence and his fatigue, I almost witness, in him as in me, the awesome birth of vociferation.” And so the voice, like the body overall, is also a shared experience of being: to feel our bodies moved and moving in this way in material rhythm—throat touching air that will, sooner or later, touch the ear—even as our vocal apparatus cannot touch each other.

It has taken us some time to get here, to the intimate spaces where the hornist’s voice is first manifest and to the solo repertoire. Instrumental music has long focused upon—even romanticized—the hands of the pianist or violinist, their obvious and familiar interactions with

24 Italo Calvino, “A King Listens,” in Under the Jaguar Sun, trans. William Weaver (New York: Penguin Books, 2009), 54. Philip Farkas, arguably the most influential horn pedagogue of the twentieth century, writes: “There are as many different embouchures as there are players. These differences give character and personality to each player’s performance, and indeed could not be avoided even if desired. However, there must be several basic embouchure fundamentals for all players of a given instrument. If we can discover all or most of these and apply them, we will be in a position to develop our individual differences to relieve musical expression of dullness and lack of personality.” Philip Farkas, The Art of French Horn Playing (Summy-Birchard, 1956), 19.

tools to craft, as in the title of de Souza’s monograph, a *music at hand*. The hornist’s sounding mechanism and support system (in English: *embouchure*), by contrast, is largely hidden behind the mouthpiece (in French: *embouchure*) to which it is coupled and in turn couples it to the instrument, and its operation may be less familiar to the audiences that hear it. That is, when we hear a hornist play, we often have little personal reference or grounding for how she does it. How do I share my voice, my hornistic mode of sonification at work, my musicking *soma* with you?

To produce musical sound, my intent pushes forward, air pressurized and expelled through an open vocal tract, past the larynx and human vocal apparatus, through the mouth, over the tongue, past the teeth to my lips, which have been push-pulled by the musculature of my face—which the French refer to as *la masque*—across my bone structure into a kind of puckered smile, similar to that which you experienced in the orientation exercises. The French term for the hornist’s lips is *le pince*, also the word for pliers or grippers, a tool. The lips—or only part of the lips, surrounding a narrow opening called the aperture—fly open as the pressurized air passes through them; they snap back when they have reached maximum stretch and once the pressure behind them drops. As such, the air-blown lips set up a periodic pattern, creating cyclic

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26 This move is echoed in de Souza: following sustained, first-hand performing engagement with instruments in the previous chapters, his final chapter on the horn moves from *poiesis*—making—to *aesthesis* (*Music at Hand: Instruments, Bodies, Cognition* [New York: Oxford University Press, 2017], 145).

27 Though anyone who has been to a football match may have some idea: the noise-making plastic horns known as *vuvuzela* or “stadium horns” are likely the most ubiquitous 423 instruments in the modern world.

28 The muscles include the *Orbicularis oris* (surrounding the lips) and the *Buccinators* (in the cheeks, from the Latin *buccina*, for trumpet; that is, trumpeting muscles). These are also crucial muscles in facial expression. See also Paul Ekman, ed., *Darwin and Facial Expression: A Century of Research in Review* (Los Altos, CA: Malor Books, 2006).

29 Farkas, *The Art of Horn Playing*, 25: “In a sense, it is to produce this opening [the aperture] properly that we form the embouchure at all. Certainly it is the focal point of the embouchure and the spot at which the production of sound and pitch originate. Around this opening are the surfaces that do the actual vibrating.... This opening is most apparent when the air is being pushed through it. However, the opening should be formed by the lips and should definitely exist even when the air is not flowing. Remember that this opening is formed into shape, not blown into shape.” Here, he compares the shape of the opening to an oboe, English horn, or bassoon reed, depending on the range. He later compares the embouchure to a vibrating violin string, and the air column as the bow which excites it (ibid., 27).
vibration, and what we call a “buzz” is not merely noise, but pitched sound. The smaller the aperture, the faster the cycle, and thus the higher the pitch.  

My lips alone—supported by my facial muscles, bones, and tissue—can function as a free aerophone: I can buzz pitches and melodies without further technological mediation.

In his “model voice,” Kane also emphasizes that techné—is crucial to the model, but does not include it in the original tripartite division. He writes that “techné disturbs the circulation of phoné by rearranging and redistributing topos, logos, and echos,” such as in the case of a vocoder or musical recording. “Techné,” he describes, “creates gradients and differentials.”

Here, soma is techné, the technology of sounding, and techné, technique, is fundamental to—indeed, is the fundamental—organization of fleshy soma that gives rise to the sounding voice at all.

**Labrosonics in Messiaen’s “Song”**

The solo “Appel interstellaire” is arranged in an arch form of five sections separated by long silences. The first and final sections (mm. 1–15; mm. 57–68) are kaleidoscopic collections of angular lines and idiomatic effects, often coded as extended techniques. These include: stopped horn (now as a coloristic effect) in combination with lip trills (requiring a particularly

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30 “The various contractions serve a double purpose: (1) to change the tension and thickness of the lips and (2) to change the size of the lip opening, both changes aiding each other in producing various ranges. This, though perhaps too simply stated, is the process which takes place when the horn is played. The real difficulty is in knowing which muscles to tense, how to tense them, and how much to tense them” (Farkas, Art of Horn Playing, 19).

31 This is similar to a double reed’s “crow,” which, when full-sounding and on pitch, is the signal of a well-made reed. A clarinet reed, by contrast, can only be evaluated in tandem with the mouthpiece (and some method of attachment to it, usually a ligature, through the player can also use their hand).

32 Kane, “Model Voice,” 674.

33 Ibid.
trained embouchure to quickly pivot between two *piques* in order to oscillate between two adjacent partials on the horn, giving rise to two adjacent pitches \(^{34}\), or with fluttersounding (allowing the tongue to trill, as in a rolled *r*, behind the aperture, introducing a stutter into the sound). Messiaen described these extended techniques—what Kane might classify as a surface-level manifestation of *techné*—as “various effects particular to the instrument.” \(^{35}\) From the discussion above, we observe that these are effects particular to the instrumentalist and their combined *somatic techné* of hand, lip-reed, and delivery system working upon the *echos* of the horn, respectively. \(^{36}\)

The third, middle section (mm. 27–44) is a dramatic outburst of hunting horn calls and birdsong. The latter is a common borrowing and refiguring in Messiaen’s music, but one that requires the affordances of the modern valved instruments. The former, where the performer is directed to play *comme la trompe de chasse* (“like a [French] hunting horn”), is a less familiar one. This extended technique has grounding in the modern instrument’s latent technicities,

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\(^{34}\) Before the advent of the valve, almost all trills—especially the interval of the diatonic whole step—were, necessarily, lip trills, such as in Mozart’s concerti.


\(^{36}\) “Extended technique” generally refers to different surface configurations or choreographies of forces within the player-instrument assemblage, *techné* that redistributes or reconfigurations *topos*, that result in *echos* of the instrument that are not its normalized or idealized mode of sounding in typical musicking practice; on all levels, extended technique is a rearrangement of instrumental *phoné*. Standard examples would include preparing the piano; multiphonics on woodwind instruments, singing and playing simultaneously on any instrument, including into the wind instrument, or making air sounds without pitch; throat or overtone singing, yodeling, or ululation; or *pizzicato*, *col legno*, *sul ponticello*, or scratch notes on bowed strings.

For some examples, such as striking the side of the piano or rapping on the body of the violin, the redistribution of *topos* is so extreme that it may open the instrument to new organological classification: while typically a cordophonic board zither (314), a piano becomes percussively idiophonic (111.2), as much as a woodblock. This is also the case for the technique *alla tromba*, in which a flutist, clarinetist, or saxophonist buzzes into their instrument, rendering it temporarily *labrophonic*, or when a brass-player replaces their lips with a mechanical double reed at the leadpipe. Such “effects” or modes of sounding might thus be classified not only as extended technique but *extending techné*.

That they are classified as “extended technique,” and thus marked as outside “normal” technique, is a function of regulative, enculturated *logos* of *phoné* that will be taken up again in the next chapter.
intimated in the last chapter and that we will explore later in this one. For the moment, however, I will consider the lyrical second section (mm. 16–26; ex. 3.1) that is reworked for the fourth section (mm. 45–56); the composer describes these as two phrases of “song.”

Example 3.1. Messiaen, “Appel interstellaire,” mm. 16–26, horn [concert pitch, from score]

Messiaen’s compositional voice is unmistakable here, as the “song” embodies many facets of his quixotic approach to the *echos* of melody and rhythm that had been articulated in *The Technique of My Musical Language* early in his career. In this lyrical passage, we can observe his general avoidance of tonal diatonicism, manifest in the saturation of sevenths and particularly tritones (especially in mm. 24–25), as well as ametric, palindromic rhythmic figurations that he referred to as “non-retrogradable rhythms” (m. 16).

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37 Messiaen, liner notes to Erato recording of Des Canyons aux étoiles...
39 *The Technique of My Musical Language*, 20–21.
Of the solo, Messiaen noted: “The whole piece requires a marvelous horn player, capable of mastering the special effects and of achieving absolutely perfect pitch, for the melodic themes and passagework demand the greatest precision. As you know, with a horn one has only to slide the lip or lightly touch the valve to obtain a totally different note.” Messiaen’s description of hornistic *topos* encourages us to focus upon the action and choreographies of musicking, and read closely for the corporeal actions and interactions it asks of the performing incorporated hornist. “Sound is created and shaped in the action and transmission of vibration,” Eidsheim describes. “A person’s body is also conditioned, shaped, and created within that time-frame, and the sounds it can produce are determined—and limited only—by the range of action and material transmission. That is, we participate in the points of transmission: for each of us, there is no knowable music or sound before its singular transmission through us.” In what follows, I will describe in detail the actions of the lips, tongue, and air delivery system in tandem with the fingers-at-valves and the tube-air of the horn. I seek to express in slowed time, to impress upon you and upon my own consciousness, that which I feel and is inscribed upon the inner and outer surfaces of my body, that which it “knows”—but which has perhaps not been legible to you or has long passed into my habituated techné—when I make my horn speak, when I sing Messiaen’s song.

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41 I also understand this as an extreme form of Nicholas Cook’s formulation of the score as script, with extreme focus upon stage directions (“Between Process and Product: Music and/as Performance,” *Music Theory Online* 7, no. 2 [2001]: n.p.). Recall that Cone (*Composer’s Voice*, 11) argued that stage directions have no meaning for the reader of a play, because he is, perhaps, more focused on the aural.

42 Eidsheim, *Sensing Sound*, 17–8; emphasis added.

43 I am also very aware of a favorite warning from tubist Arnold Jacobs, recounted to me often by Randy Gardner, of “paralysis by analysis.” This is, of course, much more detail than any hornist would consider in performance, or even in practice, of the work: the majority of this action is long habituated and made automatic through thousands of hours of accumulated practice.
The passage is relatively slow: written at 60 eighth notes per minute. The second hand on a watch can give me my sense of tempo, or I can feel it as somewhat slower than my resting heart rate. Before I play the first note, however, I take a breath in time through the corners of my mouth—already placed at the mouthpiece—and snap my corners and embouchure into place during the eighth note rest that precedes the first sounding pitch. The silence on the downbeat implies, perhaps, that the song should emerge from the long silence that precedes it, but also aestheticizes Eidsheim’s realization that music is action—of the performer, or of the more subtle anticipation of the listener, the holding of breath—before it is sound.44 Here phoné is techné and soma before it can be echos.

This pitch—G—is almost in the exact middle of the horn’s functional range, and so quite comfortable, especially when approached at the written mezzo forte dynamic. All the pitches in the first measure are slurred together, so the tip of my tongue is not used to articulate; however, the back of my tongue aids in the shifting of pitches sounded by my lips as the musical line chromatically winds its way upward. The first G (horn D) might be approached with tuh to set the aperture in motion at 196 cycles per second, the D-flat (277.18 Hz) with -ah—tuh-ah with my tongue—while the muscles of my embouchure (the chin, jaw muscles, and corners of my mouth, the orbicularis oris supported by the buccinators) contract and shift in order to tighten the aperture, to increase the frequency of the buzz toward the upper middle register.45 My digits-at-valves engage in cross-fingering: the G is played with the index finger, the D-flat with middle-

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44 Eidsheim, Sensing Sound, 130.
45 In addition to the use of the tongue and soft palate, recent research in kinesiology has identified the (non-phonating) glottis as a crucial “point of resistance” in the hornist system. Despite the general recommendation to keep the throat open, it appears that the larynx and vocal folds may be involuntarily activated to assist in the hornist’s ‘getting over the break’ between partials. See Sarah L. Gillespie, “The First Point of Resistance: A Descriptive Pilot Study of the Larynx and Vocal Folds during Horn Performance” (DMA essay, The University of Wisconsin–Madison, 2016).
and ring-fingers, so the first finger must release the valve at the same time as the second and third engage—along with my tongue and embouchure’s movement—in order to execute this tritone.

The six notes (or five pitches) beginning with D-flat are a chromatic tangle, more complex in terms of finger work, and the work of the embouchure more is subtle; each pitch has both its own fingering (in order to make the horn different lengths, amenable to a desired pitch by virtue of its location in that harmonic series) and its own *pince* (because different pitches require different frequencies). The tritone leap from the E requires movement into the horn’s upper register to ascend into the middle of the treble staff. I must be careful here: not only does the change of fingers need to be accurate (in order to access the right length of horn), but I also need to skip over two partials (those pitches that the horn wants to make, its *technē*—made when my lips meet the tube air and come into sympathy at resonance nodes in the horn—to land upon p8 of the B-flat length horn (skipping over p6 [F] and p7 [A-flat]), all while maintaining connection between the sounds. The back of my tongue raises from *-ah* to *-ee* and the corners of my mouth engage further; my jaw may also raise slightly to diminish the aperture size. But rather than thinking of the note as *high*, it is often more effective for me to think of it as *farther away*, and increase air speed to meet it by pressurizing at the abdomen. The horn reacts back: skipping over partial envelopes is like skipping over piano keys with the fingers, or to use a different organological homology, it feels as though my lips and air are the stick that scrape over the grooves of a guiro. (You can simulate the sensation, too, at a different *topos*: place your hand upright, parallel to your face, with the palm facing and at chin level, your fingers an inch from your lips. Blow across the fingers as you move your hand at a moderate speed from right to left or left to right. You will feel the air articulate.)
Even though the following two pitches are lower, they are only marginally so; I cannot afford to slacken here, with respect to either sound production or musicality. As to the latter, even though there is a rest at the end of this augmented gesture, the line continues until the next measure, the descending tritone A to E-flat, which has a half-cadential feel. But with respect to sound production, descents of larger intervals are particularly touchy for the hornist. While the increased tension used to reach upward can feel precise, the inverse—the release of the descent—can feel relatively haphazard; much like when hiking up a mountain or the side wall of a canyon, it is actually the *coming down* that can present more of a problem. (In fact, it is quite common among horn players to “nail,” as it were, apex notes at climaxes, only to miss the lower notes that follow.) Luckily, the A at the end of the previous measure is retained (one would do well to not breathe during the sixteenth note rest, so as to not disturb the embouchure) and the E-flat exists in aural and haptic memory—like a foothold—since it was sounded (in the sense of both sound as aurality, *echos*, and sound as action, *topos*) in the previous measure.46

The third measure extends the song upward, continuing to turn around tritones: the E-flat–A dyad, heard in the second measure, and the G–D-flat from the first. This latter dyad is heard, however, in octave displacement. Acoustically, this simply requires doubling the frequency; experientially, however, cutting the mass of string, cord, or lip accurately in half is a bit more difficult. The upper G sits comfortably in the horn’s range, and has been an absent presence in the chromatic work leading to the second measure; the D-flat, by contrast, introduces a new upper limit to the range in this section—a full three semitones higher—and is squarely within the upper tessitura of the instrument. The leap upward requires yet further support in the

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chin and corners of the mouth, syllable shift from *ee* to *yee*, which serves to bring the back of the
tongue to almost the roof of the mouth and to bring the jaw upward to effect an increase in air
speed. Although the note is a grace note, its structural importance to the melodic line requires
that it not be too short (and that the hornist play it accurately and with good sound). The leap
downward to the A—which is taken on the same fingering as the high D-flat—requires that I
move smoothly from p10 to p8, omitting p9 (B). The next measure, however, feels like a return
to that familiar ground, stepping down through the D-flat–G dyad back into the middle register.

The next two measures (mm. 20–21) are a foreshortened statement of these first four
measures, opening and closing with the same tritone. The subsequent bar (m. 22) begins by
repeating the pitches of measure 21, but increases dynamic. By increasing the pressure in my
abdomen, air flow from my lungs increases in volume; this action is to increase the amplitude of
my lips’ vibrations, and I ‘say’ *teeee, taaaah*, introducing the tip of the tongue to the middle D-flat
to execute Messiaen’s inscribed articulation. The remainder of the measure introduces three
pitches—F-sharp, F-natural, and B—that complete the twelve-tone collection; more crucial to
the hornist, however, is the introduction of the major seventh, the largest interval thus far in the
song, and the descent from E to F, the new lowest note in the section. Moving into the lower
register is never simply a letting go: the lips nonetheless require support and control for their
cyclic vibration, especially when, in the case of the hornist, they must fit into a mouthpiece with
a relatively narrow diameter.47

This F is followed by an ascending tritone leap to B, which proceeds, in the next
measure, to an immediate leap back upward through A-flat to D-flat and back downward.

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47 The written C sounds F in the middle of bass clef; this pitch is also, for example, in the trombone’s middle
register, but the trombonist has a wider mouthpiece in which to fit the pitch; in fact, the tenor trombone and the horn
have, more or less, the same range, but their bore width, mouthpieces, embouchures, and training effect their
affordances here, as with the *cor alto* and *cor basso*, discussed in chapter one.
alternating, zig-zagging through tritones, thirds, and seconds—each pitch with its own fingering and *pinces*—before introducing the largest interval, an augmented octave, back to the low F.

While tritones (such as those heard in mm. 24–5) may divide the chromatic octave in twain, the interval is less obvious to my lip-reed-string at the horn—for the tritone does not fit easily in the *corps sonore*—and the augmented octaves present a slightly more-than doubling or halving of the lip-cord. Yet, the intervals—if not the pitches themselves—have been introduced to the singing hornist earlier in the section; thus there is some sense of familiarity, of retention in my musculature as much as in the ear, which allows the final G–E-flat dyad, heard and *felt* so many times in this song, to have become home, musically, sonically, and haptically.

In fact, no matter what fingering on my complex double horn I may choose for a given pitch—and all the pitches here have alternate fingerings that could be used to access them—my lips nonetheless buzz the same frequency, regardless of fingering. For example, for the same notated pitch I could play p8 on a G length horn (with the thumb, first, and second valves depressed, or thumb and third finger), p10 on an E-flat horn (first valve), or p9 on an F horn (no valves); but I will use, more or less, the same embouchure for all these, the same *pinces*, yielding (more or less) the same frequency: the upper written D, sounding G, cycling 196 times per second.\(^48\) The frequency remains afforded by my body, no matter how the horn knows it.

**The Composer’s Body**

My predecessors in this active attention to the labor of musical performance, to the *soma* of phoné, are many and multiple, seated at keyboards or with a cello between their legs, crucially

\(^48\) The intonation—and thus the frequencies—of the note may be slightly different between these fingerings, but the pitch remains nonetheless easily recognizable and categorizable, which we will examine further in the next chapter.
organized around *techné*. These bodily practices of music that Cusick, Le Guin, and others
described are not metaphorical, textual, or virtual bodies, the topographic figures of personae.
These are lived, actual bodies which move, engaging with someone or something outside
themselves, to *make sound*; the relationships they experience are not wholly audible.

I have described already some of these moments: Cusick recounted her experience
playing a chorale prelude by Bach, whereupon a sense of imbalance upon the organ bench
created by difficult footwork is righted at the moment when the hymn’s text describes God’s
grace. The Word is made Flesh, and “grace… *comes to the organist*” as a private message—or
gift— to the performer from Bach.49 Le Guin engaged in similar intimacies with Luigi Boccherini
at the cello, reading a sonata for experiences of tension and release, pain and comfort, and
pleasurable repetition in the hands and arms which become “themes in their own right.”50 Her
“cello-and-bow thinking” is a crucial site of a body-focused “carnal musicology” which she
understands as giving rise to a sensuous, “reciprocal,” and very real—*incarnate*—relationship
between the performer and composer. In his work on keyboard music of the late Enlightenment,
Beghin takes up the position of keyboardist as rhetorical-orator, where proper delivery (perhaps
as Cone’s “spokesman” of the musical consciousness) includes scripted arm crossings and the
suggestion of facial expressions, no less than the *echos* of appropriate instruments, as crucial
aspects of Haydn’s musical *pronunciato*.

The body in performance becomes a crucial site of research and of knowledge
production: they read their own bodies in interaction with their instruments to reveal tactile,
kinesthetic, and proprioceptive embodied knowledge in the act of musicking, illegible to the

49 Suzanne Cusick, “Feminist Theory, Music Theory, and the Mind-Body Problem,” *Perspectives of New Music* 32,
gnostic and outside of earshot in live performance. Their attention to phonè works in the crucial gap first pried apart by Cartesian dualism, between logos and soma. This approach works beyond the aurality of the body (echos) examined in chapter two; the result is a multi-sensory experience of the musical work—of its extroverted presentation and intimate experiences, choreographed by the composer, all at the level of soma—thus revealed to the reader-listener, one that supplements its mere aurality, or even bypasses it totally.

Solo repertoire is valuable for this approach because it implicitly limits the number of virtual and actual agents involved in its performance.\textsuperscript{51} The multiplicity is typically reduced to the composer and the sole performer, who takes on the role of (re)creator or orator alongside or in the stead of the composer, or else intimate with him in “carnal” “reciprocity,” the recipient of private bodily messages.\textsuperscript{52} Moreover the present performer’s body can stand in for the composer’s expressive, experiencing, yet ephemeral body—available to the analyst as a new text for haptic reading—by virtue of a kind of bodily co-location, an ultimately shared corporeality: the works under examination were written by composers for themselves to play, or at least for instruments with which they were intimately familiar as performers.\textsuperscript{53} As such, the analyses provided can trade upon the authority of the composer (his logos) and his somatic knowledge of his own incorporated instrumentality, granting a new valence to what it might mean to attend to “the composer’s voice.”

\textsuperscript{51} For Cone: “the agents these bring to life are coterminous with the musical personas of their respective compositions…. the instrumental agent is imagined as existing precisely through its musical thought, and when, in a solo work, that thought is the complete composition, unitary agent and complete persona coalesce into one unitary virtual persona” (Composer’s Voice, 98).

\textsuperscript{52} The notion of composer-performer as rhetorical orator is from Beghin; the notions of “carnality” and “reciprocity” from Le Guin. Le Guin also writes: “as agents we will more or less deliberately pursue certain sensations as modes of relation” (Boccherini’s Body, 7).

\textsuperscript{53} Beghin’s The Virtual Haydn also includes consideration of the role of the dedicatee, importantly questioning who he (Beghin) becomes at the keyboard: him (Haydn, the composer) or her (Theresa Jensen, the dedicatee). This is a crucial expansion of the auto-affective feedback loop. Tom Beghin, The Virtual Haydn: Paradox of a Twenty-First Century Keyboardist (Chicago: University of Chicago Press, 2015), 1–42.
Recall that for Cone, “to compose is to control this inner voice, to shape it into new forms, to make it speak for us.” This instrumental extension of phoné confirms the promise of the composer’s omniscience and omnipotence, his knowledge and control over the body. To listen to music,” or perhaps perform it, “is to yield our inner voice to the composer’s domination. Or better: it is to make the composer’s voice our own.” In their essays, these performer-scholars engage in an act of deep, multi-modal listening to, observation of, and presentation of their musicking bodies, able to assume almost complete identification with the composer, that “one creative human consciousness” of Cone’s analysis. Phoné becomes—or remains—the composer’s logocentric control of soma and somatic substrate of logos, a wider but nonetheless closed loop of shared corporeality and techné, able to channel his voice as no other and gaze back upon his work.

Yet the “Appel interstellaire” was not written by a hornist; Messiaen is not here—not at my lips, my body—when I sound the solo. While the aural (echos) is what brings us into

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54 In other words, this is how Le Guin, Cusick, and Beghin’s analyses can provide a radical critique that can be easily valued in musicological economy: instrumentality provides a unique and unparalleled identificatory stance with the composer. The focus, it seems, is upon a kind of reconstruction of a thickness of the work of the musical work before it transcended, nonetheless returning to an elusive, ephemeral original. These present-day academic performances labor under the regulative work-concept, the hypostatized and hierarchized roles of composer and performer, him and me, and they perform rhetorical closure under the sign of the composer—experience becomes that of Boccherini’s body at the cello, a virtual (but absolutely realized) Haydn at the keyboard—and a gaze trained upon his (work) corpus. Though, in fact, all of their principal examples—from Bach to Boccherini to Haydn, composed more or less in the time before the work concept was reified, before the schism of performer, composer, and audience.

55 Cone, Composer's Voice, 157.

56 Recall that, for Cone, “The persona of a composition for a single instrument is symbolized by the musician-cum-instrument, but it is realized in the voice of that instrument. The persona of a violin partita is a violinistic persona; the persona of a piano sonata is a pianistic persona” (Composer’s Voice, 106–7). So, even if not co-terminus with the composer “himself,” the performers of the work, which at one point included the composer, have realized the same or a very similar pianistic or cellistic persona, which nonetheless brings us back to notions of origins, authenticity, and integrity and ultimate closure of soma-logos. This is at work, then, even in Beghin’s more nuanced reading of the sonata, the composer, the dedicatee, and ‘I’.
milieu—reaching across the gap between us as hearer and heard—the bodily action, the tangible, the *soma* is mostly if not wholly mine.

This leads to the question of *why this work, here? Why, then, use Messiaen’s voice as an examination of my own?* First, I happened to be studying this solo when I first encountered this inspirational body of work, which led to critical engagement with their analyses through my own experiences as a solo performer, but one that cannot claim such identity with the composer of her *echos*. Second, while I could engage in apologetics for the work of hornist-composers and the particular embodied knowledges and pedagogies they transmit, their works—and their voices—will likely never carry particular currency in musicological economy.\(^{57}\) Instead, consideration of Messiaen’s composition—a work that benefits from Messiaen’s skill and notoriety; a work that is both quite typical and fairly unique in the composer’s output; and a work that has a somewhat complex compositional history as well as a rich post-premiere performance history—has led me to questions about musical and written performances of embodied knowledge, the voices they evoke or invoke, and where “my” voice—or other voices—might be found.

My obvious antecedents—ancestors—here are Sharon Moe, the hornist who played the solo at the New York premiere of *Des Canyons aux étoiles...* in 1974, or Daniel Bourgue, who played a version of the solo, simply titled *Pièce pour cor*, at a memorial concert at the Royen

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\(^{57}\) Horn players, too, have found themselves as composers; like Boccherini, their compositions were primarily for their own use as performers or pedagogues. Punto composed several concerti that are still widely played in Bohemia; Richard Strauss’s father, the well-respected hornist Franz Strauss, wrote a concertino and several romantic character pieces that are common recital fare. In the twentieth century, Russian hornist Vitaly Boyanovsky composed a series of highly virtuosic character pieces, and American pedagogues Verne Reynolds, Douglas Hill, and Randy Gardner have all written solo works. Conductor-composer Esa-Pekka Salonen studied the horn in his youth, but his fiendishly difficult *Concert Etude* was written, he says, “for the great horn player I never became” (*Salonen, program note in *Concert Etude for Solo Horn* [London: Chester Music, 2000]). Familial or friendly proximity to the horn also yielded idiomatic and virtuosic solos by Richard Strauss (his father Franz), Wolfgang Mozart (his dear friend Ignaz Leutgeb), Gioachino Rossini (his father Giuseppe), and, of course, Johannes Brahms (his father Jakob).
Festival some two years before, when the freshly commissioned symphonic poem was inchoate in Messiaen’s mind. Or even Georges Barboteu, the newly appointed senior professor of horn at the Paris Conservatoire, who visited Messiaen’s composition class sometime in the very early 1970s, where he demonstrated all the affordances of the horn and “effects particular to the instrument” that the meticulous composer-pedagogue likely recorded in his notebooks for future use. While I know Messiaen, how do I feel their presence so closely?

**Vocalic Organization and Voicelikeness**

Roland Barthes attributes a particular power to the romantic instrumental voice by virtue of its recourse to *echos* and *topos* in order to bypass linguistic meaning almost entirely. 58 Though Messiaen’s language is distinctly modern rather than the mellifluous melodies of the Romantic style, the composer’s recourse to the notion of “song” to describe this section brings it into relationship with the music of Barthes’s musings. “All romantic music, whether vocal or instrumental, utters this song of the natural body: it is a music which has a meaning only if I can always sing it, in myself, with my body,” Barthes continues. 59 “For to sing, in the romantic sense, is this: fantasmically to enjoy my unified body. What, then, is this body which sings the lied? What is it that, in my body, sings the lied to me listening?” 59

Positive comparison between various instruments and the human voice has a long history, and instruments and instrumentalists have long aspired to the condition of vocality. But what does this mean? A great player is generally said to “sing” on their instrument by virtue of an

59 Ibid., 288.
60 Ibid.
vaguely felt “expression.” It seems to lodge in the instrumental performer’s ability to create a convincing interpretation (within the appropriate bounds of Werktreue and “the perfect performance of music”), with the effect that the player has internalized the “music itself” or the musical consciousness, and is able to give it appropriate sonic embodiment.\(^{61}\) A human voice is understood to express the thoughts, life, and emotion of the individual who lives it—it is, after all, the chief carrier of our communications from one to another, and the best performances of instrumental music are understood, in like guise, to “awaken the feelings and passions of human nature.”\(^{62}\)

Indeed, “the very power which instrumental music possesses over us,” wrote Sir Thomas Lauder in the mid-nineteenth century, “depends entirely on the extent to which this mental feeling and expression can be imitated.”\(^{63}\) This sensibility—in tandem with the pro-instrumental, absolutist aesthetics of the period—dislodges the primacy of the words the voice utters (logos) into, perhaps, its paralinguistic elements of pitch, intonation, rhythm, and timbre. This requires, of course, shared affordances between voice and instrument at the level of echos; to this end, we observed in the last chapter that the horn became vocalic, perhaps, by virtue of new chromaticisms, whether by virtue of hand or valve technicities.

Instrumental technology has, at times, tried to capture or trade on voice-like sound by virtue of range, analog fluency (as in the Theremin), resonance (legato and the sustain pedal on the piano), or its very timbre (as the organ stop called vox humana).\(^{64}\) There have even been


\(^{63}\) Ibid.

\(^{64}\) The *vox humana* is a short resonator reed stop almost invariably used with tremulant to add “vibrato” to the sound. For more on the reception of the vox humana, see Edmond Johnson, “The Organ’s Controversial Voice: A Critical
instruments that have tried to generate speech-like sounds, such as Joseph Faber’s euphonia. Overall, the desire to realize the *echos* of the voice by virtue of instrumental *technology* refocuses our attention to where *echos* meets *topos* and *techné*, where positivist organological *phoné* resides. To this end, empirical musicologists Emery Schubert and Joe Wolfe examine various parameters by which an instrument is voicelike, or to what degree can be said to possess “voicelikeness,” by virtue of acoustic parameters, of psychology (perception and cognition), and “expressiveness.”

The modern vocal instrument is typically understood to be centered epilygerically, that is, in the area surrounding the larynx, and perhaps mostly based in the vocal folds. Nina Sun Eidsheim outlines an “organology of the voice”: the singer’s voice is distributed into the organized activities of the lips, teeth, hard and soft palate, tongue, uvula, and lungs in tandem with the movements of the folds, glottis, and surrounding larynx. Re-articulating the voice into the actions of these distributed organs that both precede and succeed the vibratory action of the vocal folds, vocal pedagogy reveals the voice as a collection of the body’s material capacities and affordances, “clappers and resonating cavities,” coordinated actions, and transfer of forces that give rise to sound and provide the means for its amplification—or the extension of the body Western instrumentality portends. “The voice finds its origin in the echo of all the different

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66 The inverse has also been the case: that *techné* has been ‘applied’ to the vocal instrument (*soma*) or vocal sound (*echos*, as a kind of post-production) in order to make it more technologized, and thus less human. A common example would be the vocoder.
67 Schubert and Wolfe, “Voicelikeness.”
69 Nina Sun Eidsheim, “Maria Callas’s Waistline and the Organology of Voice,” *Opera Quarterly* 33, no. 3–4 (Summer–Autumn 2017): 250. This articulation of the vocal mechanism into a corporeal system is, ultimately, what allows for the voice to “wordlessly sing the history of the body” (Barthes), even if we are not always exact in the ways in which they are interconnected, as Eidsheim investigates here.
kinds of tubes and hollows where my body subtracts in part from itself to come and resonate there as a ‘sonorous body’ [corps sonore],” Szendy writes. “From this point of view there is no essential difference between the voice projected for itself and a horn [cor].”

We have already observed how the hornist uses, if not vocality, than at least orality in the sounding of the horn. In fact, Schubert and Wolfe demonstrate that, by acoustical parameters—that is, the material configuration of the instrument and player, the coordination of air and sound energy, and, to some extent desirable vocalic affordances such as portamento and timbral shift—that instruments are, mechanically, the most like the voice. Restated: in a phoné of voicelikeness built upon topos alone—and here very much soma—the voice and the horn are in very close relation, indeed. Building upon his famous attention to the body’s materiality in the voice, Barthes writes elsewhere: “The singing voice, that very specific space in which a tongue encounters a voice and permits those who know how to listen to it to hear what we can call its ‘grain’—the singing voice is not the breath but indeed that materiality of the body emerging from the throat, a site where the phonic metal hardens and takes shape.”

This invites an inversion: were the voice included in existing positivist organological classification—though it is not, since it is bounded by the performer’s integument, is not directly

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70 Ibid. This notion is echoed in acoustic science and speech studies: “The vocal tract modifies the wave glottal wave” produced at the vocal folds, “enhancing those frequencies that correspond to the vocal tract’s natural resonant frequencies and dampening those that do not” (William J. Mullin et al., Fundamentals of Sound with Applications to Speech and Hearing [Amherst: Off the Common Books, 2016], 100). The authors go on to make analogy to a trumpet (Ibid., 101).

71 Schubert and Wolfe, “Voicelikeness,” 249–53. “At the functional level, the vibrating elements of brass instruments have strong similarities to the voice. In both, the source of sound is the modulation of the breath by two vibrating tissues: the player’s lips for brass and the vocal folds for the voice…. Furthermore, in both cases these tissues are acoustically coupled to resonant acoustic ducts on both the upstream and downstream side. The difference is that one or more of the resonances in the bore of a trombone largely control the frequency of vibration of the lips, whereas the resonances of the (much shorter) vocal tract modify the amplitudes of higher harmonics, contributing to timbre rather than pitch” (Ibid., 253).

Of course, other instruments afford certain parameters, such as the violin’s portamento, more than a horn. The comparison by virtue of acoustic factors is, the authors admit, decidedly reductive (Ibid., 249).

visually observable, and it does not endure and cannot be placed in a museum—it would surely share taxa with other aerophones (4). (In the only revision of H-S I could locate that mentioned the human voice, Knight notes that “if the human voice were to be assigned a classification,” it would be grouped with free reeds such as the harmonica.73) The vocal folds might be understood to be blown as throat-reeds, or, from a labrosonist’s perspective, throat-lips, which also reflects their shared material of transduction: the flesh of the body.74 The techné of the incorporated hornist, like that of the instrumentalized vocalist, includes the organs and choreographies of the respiratory system and vocal tract (soma), but the muscular fibers that excite vibration and produce sound are transferred from within the throat of the vocalist to the surface of the hornist’s mouth (a techné that redistributes topos).75

Like Eidsheim’s observations about singing, horn playing is, as we have seen, largely an “internal corporeal choreography” that utilizes one of the possible sonorous interfaces of the body—the lips rather than the vocal folds.76 The orality of the hornist-in-action is largely used to shape the pre-labial delivery system for efficiency, where for the singer, movements of the mouth (soma) are to shape post-laryginal phonation to produce formants, selecting and filtering


74 In fact, neither the lips nor the vocal folds are muscles; rather, the former are skin, the latter are ligaments. Both, however, can be subject to tension by the muscles of the face or larynx, respectively.

75 Fitzpatrick points out that in Domnich’s native Bohemia, the mastery of singing was required for admission to seminary-based education from which Domnich, his college Fröhlich, and his teacher Punto all benefited—and so an essential foundation for access to any education. In addition to his profound skill as a cor basse, Punto was said to have a wonderful Basso voice (Fitzpatrick, The Horn and Horn Playing, 179–80). See also Tiffany N. Damicone, “The Singing Style of the Bohemians”—A Study of the Bohemian Contributions to Horn Pedagogy, Western Perspectives on Czech Horn Playing and Analysis of the Teachings of Zdeněk Divoky at the Academy of Performing Arts” (DMA document, The Ohio State University, 2013).

76 Eidsheim, Sensing Sound, 111–12.
overtones that create the shifts in timbre (all *echos*) that we associate with different vowel sounds (*logos*).\(^77\)

And like singing pedagogy, brass instruction can often make use of metaphor or homology to both musical or non-musical sound, mechanics, and sensation. One of my teachers, William Purvis, makes analogy to the mechanics of string playing: the aperture acts as the string and the air stream as the bow that excites it. But in fact, this is no mere metaphor nor mimicry; it is, rather, a *homology*, operational: it opens the hornist toward acoustic *violinlikeness*.

Alternatively, a desiring hornist may be trained in anatomical and experiential mapping the systems of the body in order to build an efficient horn blowing system.\(^78\) For example, Richard Deane’s treatise includes images from *Grey’s Anatomy*, and in his pedagogy, the body is conceived of as an embouchure system (with vibrating surface, the lips, and a supporting muscular system) and a breathing system (of reservoir, pressurization mechanism, delivery channel, and resonating space, corresponding to lungs, abdominal muscles, throat, and mouth, respectively) that work with the horn.\(^79\) Very often, these methods apply equally to all lip-vibrated aerophones, as is the case with Philip Farkas’s photographic embouchure studies in *The Art of Brass Playing*.\(^80\)

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\(^{77}\) In the acoustic section of their review of voicelikeness Schubert and Wolfe (“Voicelikeness,” 249–53) underplay the role of the vocal tract in wind instrument *phoné*, which has a great deal to do with timbre, intonation, and other aspects of *echos*. A closed throat, for example, results in a strained timbre; a narrowed oral cavity will, like the singer’s /i/ formant (indeed, based on the same principle), produce a brighter sound than an open /a/ cavity. This omission at the level of “acoustics” appears to be because of a general neglect of the player’s agency beyond providing a generalized sounding apparatus; that is, the corporeal *player* is necessarily included, but not necessarily an agentic, expressive *musician*. This is somewhat remedied in the third section on “expressiveness” (ibid., 255–7).

\(^{78}\) This is similar to the intermingling of anatomical science and music studied in Davies’s *Romantic Anatomies of Performance*; advances in medical imaging have allowed for an increasingly empirical and visual study of instrumentalist’s apparatus, such as in Farkas’s *The Art of Horn Playing* and *The Art of Brass Playing: A Treatise on the Formation and Use of the Brass Player’s Embouchure* (Brass Publications, 1962) and Eli Epstein’s appropriately named *Horn Playing from the Inside Out*.

\(^{79}\) Richard Deane, *The Efficient Approach: Accelerated Development for the Horn* (Atlanta: Atlanta Brass Society Press, 2009). Deane was my first “serious” horn teacher; I studied with him from 1999–2002, while he was third horn of the Atlanta Symphony.

\(^{80}\) Farkas, *The Art of Brass Playing*.  

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Blown aerophone pedagogies, such as in the orientation exercises above, also use phonemes and syllable complexes to convey various forms of articulation and oral cavity shape. This has been the case since some of the earliest horn treatises written in the fifteenth century. These are generally not vocalic sounds which are translated haphazardly or idiosyncratically into instrumental production as metaphors or even homology; rather, excepting phonation at the vocal folds, they are the aerophonist’s actual bodily choreographies realized behind the aperture. “The relationship between horn playing and singing is absolute,” Dominich explained in his 1808 Méthode. The beginner, even before he first places the mouthpiece upon his lips, must already have acquired perfect facility in binding notes together in legato, in identifying intervals, and in matching the pitch of a given note; all learnt by practicing Solfeggio. Although this grounding is useful when learning other instruments—it is useful for developing the logos of phoné’s echos—it is indispensable in the case of the horn at the level of somatic technique of phoné. In fact, Fitzpatrick posits that hornists may differ in quality of sound and articulation partly due to the spoken languages they command—the presence or absence of certain phonemes, and thus tongue placements or modes of aspiration and voicing—available to the executant by virtue of their cultural milieu.

Renowned American horn pedagogue Eli Epstein combines metaphorical and literal approaches—analogy and homology—depending on the mechanism under consideration. For example, for oral cavity shape and tongue placement when articulating, he divides the range of

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81 Domnich, Méthode de Cor Alto et de Cor Basse, 4, as translated in S. Earl Saxton and William Morrow, “Do You Blow or Do You Sing on Your Horn?,” The Horn Call 3, no. 2 (May 1973): 39.
82 Ibid.
84 Horn Playing from the Inside Out.
the of horn and assigns them unique syllables, such as we examined in the orientation exercises, above, or as I utilized in my performance of Messiaen’s song. For the control of air speed and pressure lower in the system, however, he makes analogy to viscosity of liquid dairy: he suggests, for example, that lower notes or softer notes require “thicker” air, the consistency of cream or half-and-half, higher or louder notes might be closer two percent milk, or skim.

Yet Epstein’s dairy analogy relies, perhaps, less on conceptual metaphor than upon mouthfeel, the haptic memory of the multi-sensory experience of taste. Mouthfeel is, in essence, food touching us back, and the mouth is, for the infant as well as the animal, an important site of engaging with the world. Similarly, Farkas set an exercise of random pitches in which the hornist would not aurally ideate each pitch before playing, but rather would to “try to ‘taste’ each note. Every note has a distinct muscular setting,” referring to the pince, “almost a ‘flavor’ of its own. It is this distinction in taste and feel, almost instinctive, that we wish to develop for each note on the horn,” or—due to the action and reaction of coupling, touching and touching back—the horn gives to us.85

The mouth, then, is not only the site of oral performance for vocal/ic expression: in fact, as Eidsheim reminds us, vocalization is a secondary use of the oral tract, whose first use is for breathing and ingesting food, for all nourishment once the infant has exited the womb.86 “The voice is but one type of production generated by the mouth,” Brandon LaBelle writes in the introduction to his Lexicon of the Mouth.87 “Parallel to voicing, it also continually fills with breath and food, to respire and ingest; it lingers over the taste of another (the central axis of

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85 Farkas, The Art of Horn Playing, 68.
86 Eidsheim, Sensing Sound, 115. Similarly, Farkas writes that “It is a process of developing muscles which nature never intended to do more than ‘bare the fangs’ in more primitive days” (Art of Horn Playing, 62).
primary memory), to also move with sudden hiccups or stutters, kisses and murmurs, and to mediate innumerable exchanges." He describes the mouth as “an extremely active cavity whose movements lead us from the depths of the body to the surface of the skin, from the materiality of things to the pressures of linguistic grammars.” The mouth is thus capable of a wide array of actions, and is revealed as a multiplicitous, heterogenous “territory of oral performativity.”

Consider the ludolinguistic phenomenon of a baby babble. Rather than meaning-making systems built upon difference within *logos*, such as those posited by Derrida and Saussure, Eidsheim’s action draws upon the work of linguist Roman Jakobson to reveal the *somatic* origins of speech. Jakobson notes:

Often the sucking activities of a child are accompanied by a slight nasal murmur, the only phonation which can be produced when the lips are pressed to mother’s breast or to the feeding bottle and the mouth is full. Later, this phonatory reaction to nursing is reproduced as an anticipatory signal at the mere sight of food and finally as a manifestation of a desire to eat, or more generally, as an expression of discontent and impatient longing for missing food or absent nurser, and any ungranted wish. When the mouth is free from nutrition, the nasal murmur may be supplied with an oral, particularly labial release [/m/]; it may also obtain an optional vocalic support [/a/].

/mə/. 

A horn is, like the mouth that meets it, a multifunctional site. Horns have been used as far more than musical or signaling instruments, for more than expressive or projective sounding. Horns have been used as drinking vessels for ale, wine, and water; sometimes, blowing and drinking horns were one and the same object. In the case of the precious Oliphant carved from

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89 Ibid.
90 Ibid., 2.
elephant’s tusk, they were vessels for sacred oil or holy relics. A horn of charter was a physical symbol of a verbal legal contract of enfeoffment, or land transfer; the horn of plenty—derived from ancient Greek myth—promised abundant sustenance. It can even be used as a bludgeon, as Roland did, after he used it to call, too late, for Charlemagne’s armies to come to his aid, and ultimately sounded his impending death. Or in the case of avid huntsman and sonneur Charles IX, horning may be the cause of death. Horns are the sites of multiple and heterogeneous interminglings and events.

When sounding in the normative mode, the mouthpiece and horn are not passive recipients of my lips’ vibrations; they are crucial collaborators in my incorporated phoné. The experience is not only of the hornist expressing through the instrument, but of the horn impressing within the coupling act. The horn takes agency, funnels my lips’ vibrations to its nodes and resonances, to the grooves and folds within the cor sonore, establishing habilitated patterns, feedback loops that operate in various durations, repetitions that give rise to duplications: /ma-ma/. As my horn and I vibrate in material exchanges in the thick event of phoné, I hear and feel, even taste, the echoes of all my teachers who have taught me to sing.

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93 Samuel Pegge, “Of the Horn as a Charter or Instrument of Conveyance,” *Archaeologia* 3 (1775): 13–14. Interestingly, this Pegge is an ancestor of Reginald Moreley-Pegge, who wrote one of the most important English language books on the horn in the mid-twentieth century.

94 Upon his death, May 30, 1574, his chief physician Ambrose Paré is reported to have said, “Il estoit mort par s’être trop fatigué à sonner de la trompe de chasse du cerf, qui luy avait trop gâté son pauvre corps,” (cited in Henri Chevreul, “Introduction,” in *La Chasse Royale*, by Charles IX [Paris: Bonventure et Duceossis, 1858], XIV), though Charles had also long been suffering from worsening tuberculosis. De Fouilloux’s book on *La Venerie*, cited below, was dedicated to the late monarch.
“And then the cries burst into the stillness”

Messiaen is perhaps most famous for quoting birdsong in many of his compositions, and *Des Canyons* is no exception: there are several movements which are based upon the phoné of single bird species, and in the “Appel” there are two. The first is a capture from the Hwamei (Chinese Melodious Laughing Thrush; *Garrulax canorus*) in the first section of the solo; the bird’s particular virtuosity—“loud, clear, varied whistling with regular repetition”—almost disappears in the hornist’s acrobatics in the opening section of “techniques particular to the instrument” that precedes the “song.” The second bird, the Canyon Wren, is heard in the third section during the emotional climax when, in Messiaen’s words, “the cries burst into the stillness.”

Bird sounds, in fact, come in two forms: *songs* and *calls*. Calls are exhibited by most kinds of birds and are inborn or genetic modes of sounding. They consist largely of peeps, squawks, and buzzes, short acoustic events rather than musical melodies, *per se*. They are used, like a human infant’s cry, to speak to a variety of listeners, such as signaling warnings or simple location to the flock, or to communicate the desire for food from a parent.

Only certain kinds of birds are able to create long, elaborate melodies—generally used by the adult members of the species for mating or to demarcate territory—by virtue of a highly developed, highly complex vocal organ. Unlike bird calls, birdsongs are at least partly learned, always practiced, and fairly specific to each species. Moreover, because they are learned, these songs are subject to both geographic and individual variation within a species, not unlike speech, or music. Through the force of Messiaen’s meticulously honed musical consciousness, what he

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95 Messiaen, liner notes to Erato recording of *Des Canyons aux étoiles*....
referred to as “his deforming prism,” these virtuosic melodies are stretched to the speed of human hearing, execution, and notational possibilities.96


Of course, the instrument provides both affordances and limitations (soma is always techné) for sounding: through valve horn technicity, the hornist can fairly closely approximate the intervallic relationships, rhythmic speed, and tempi shifts of the canyon wren’s characteristic song, but cannot reach the bird’s stratospheric pitch or the liquid, portamento descent afforded by its syrinx. And despite Messiaen’s exacting notation, the pitch grid of the musical staff exerts its own affordances and limitations: no matter how faithful the player is in the rendering of this passage, Messiaen’s birdsongs are always distinctly Messiaen’s phoné. Notation is not just the means by which we encounter the composer’s voice or a script for our actions: it is also a manifestation of logocentric reduction and control of unruly echos.98

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98 Eidsheim performs similar critique of notation, redistributing emphasis from echos to soma, in her comparison of “sound-based” and “action-based” vocal pedagogies (Sensing Sound, 132–53), as well as her attempt to notate the corporeal choreographies of the experimental work Body Music (Ibid., 116–20).
While there are substantial material and signal similarities between the human and avian vocal instrument, there is another mechanism at work when we interpellate the bird’s *echos* as *voice*: our desire to make it so. In the bird’s sounding, we begin to attribute *logos*, consciousness, and language. That we call a birdsong a *song* at all writes our *logos* onto the bird’s *echos*, domesticates it in some ways; it makes it available to us for capture and redistribution into notational systems and recreation on other, non-bird instruments, including our own. Messiaen, for his part, considered birds to be among the earth’s finest musicians. In this way, we also attribute voiceliness to the bird because we also recognize something of ourselves in its *phoné*.

From the psychological perspective outlined in Schubert and Wolfe’s voiceliness, we attend to the human voice above all because, from infancy, we dedicate and hone unique neural circuits to attend to its sounding, and for good reason. As Jakobson showed, our happenstance actions—breathing, suckling, enjoying the tickle of our own lips—give rise to soundings that, to our delight, evoke responses from others. We realize that they attend to our needs by virtue of our sounding. By developing the *technê* of voice, we can signal our material and emotional needs and, by the attention it commands, have them met. Paying close attention to the utterances of others, activating shared action-perception circuits and experimenting with these utterances in our own *phoné*, and the responses these utterances command, we develop and practice unique movements of *topos* to signal these different needs and desires unto the world, to summon

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99 Schubert and Wolfe, “Voiceliness,” 255: “Another way of explaining the perceived similarity between the singing voice and a musical instrument,” or in this case, a bird, “is that top-down processing overrides the bottom-up signal similarities.”

100 Messiaen in Samuel, Olivier Messiaen: Music and Color, 85.

them—/ma•ma/, /pa•pa/, /ba•ba/—into being.

Origins of the Hornist’s Voice: Calls, Sonneries

Alongside the canyon wren’s song, Messiaen asks the hornist to play comme la trompe de chasse, or “like a [traditional French] hunting horn.” He described this as the horn “going back to its original nature.”102 But what can this mean? What are the origins of the horn—or the hornist?

The first trumpets, Sachs suggests, may have begun life as speaking tubes of cane, wood, or bark, effectively megaphones into which the “player spoke, sang, or roared.”103 These found objects were discovered to distort the “natural” sounding of the voice; applied as a supplemental techné of the human vocal topos, this “voice disguiser” allowed the merely human voice to become the voice of the gods.104

The simplest labrophones proper, played with the vibration of the lips, are hollow tubes which require little by way of an embouchure: they are held firmly to the mouth and the lips are allowed to be blown open, and examples abound throughout the world.105 One of the most interesting—and here particularly salient—examples is the Aboriginal didgeridoo, which is a tube of some 150cm in length (either cylindrical or conoidal, often a eucalyptus tree root naturally bored out by termites) played with labrosonic lip-vibration and often also with phonation at the vocal folds; upon this oral duet, the tongue articulates syllables to create textured, pitched drones. While sounding, the player adjusts the shape of their oral cavity (as

102 Messiaen, liner notes to Erato recording of Des Canyons aux étoiles….
103 Curt Sachs, The History of Musical Instruments (New York: W.W. Norton, 1940), 47.
with speaking or singing formants) to select and bring out various overtones within the droned pitch, creating a kaleidoscope of timbral color upon the same instrument, often in imitation of local birds and other fauna.\footnote{Sing and play,” sometimes referred to as “multiphonics,” is also an extended technique (that is, a mode of sounding outside the normalized parameters for sound on the instrument) available on other lip-vibrated aerophones. Punto and virtuoso Eugène Léon Viver were known to employ technique, but its use was generally derided as gimmicky and in poor taste for serious musicking. Nonetheless, J. R. Lewy includes the technique in his études of 1850 and Kling takes up a description in his 1865 Hornschule, as does Franz in his later method. Among the earliest notated examples for horn is in Carl Maria von Weber’s Concertino for Horn and Orchestra in E minor, Op. 45, first written in 1806 for Carlruhe hornist C. Dautrevaux and revised in 1815 for Munich-based virtuoso Rauch. Now, it is a relatively common technique in experimental music for the horn. By singing and playing into the instrument simultaneously and with good intonation at both the vocal folds and lips and balance between the vocal and instrumental sounding, the hornist can give rise to combination tones and effect not merely two, but three or four pitches at once in the ear of the listener. The technique is, however, quite tiring for the vocal apparatus. “Voicelikeness,” 251.} In fact, Schubert and Wolfe name the digeridoo as presenting the most voicelikeness by virtue of acoustic properties, its material disposition and choreographies.\footnote{Montagu, The Conch Horn, 2–4. Baines also notes that long “composite trumpets,” mixtures of wood, cane, gourd, and/or horn bound with fiber “are distinguished from the more primitive instrument by different handling of the raw material and by sounding with strong embouchure on high or fairly high harmonics” (Brass Instruments, 48–9).}

The organized embouchure becomes necessary when the tube is narrower than the player’s mouth in order to provide a way of coupling to it—such as with conch shell “trumpets” (but more properly, since they are naturally conoidal, conch shell horns).\footnote{For more on the instrumental conch, see Jeremy Montagu, The Conch Shell (self-published, 2018); for more on the shofar, see Ibid., The Shofar: Its History and Use (Lanham, MA: Rowman & Littlefield, 2015).} This is also a principal rationale for the creation of the mouthpiece, which widens the mouth of the instrument to receive our lips. But no matter the tube width, the player must cultivate a more refined fleshy coupler if they are to play loudly or for long periods of time—a conchist’s single note signaling blasts can be heard, by some reports, two miles away—or to predictably play more than one note, such as with the generally two-pitch shofar.\footnote{We thus observe the hornist’s first instrumentalization of the \textit{soma} into embouchure for new sounding. The \textit{technê} of the mouth is then refined for the purposes of communicating across}
distance, for signaling information, a command or a desire, as with the infant’s first words. Jakobson posits that “it would be a tempting task to trace... how the different degrees of relationship designated”—such as mother /ma•ma/, father /pa•pa/, grandmother /na•na/, grandfather /pa•pi/—“correspond to the development of the child’s language” as she adds more complex consonants and varying vowel sounds. The more complex the relations, the more refined the techné of soma to interpellate them.

But the instrument presses back with its own technological knowings—desirous topographic technélogos—for the lips at their mouth to meet it, no less than the parent corrects the utterance of their child, inducting the child into their system of language.

The instruments called horn garner the name from the fact that many early examples were made from horned herbivores such as antelopes, elephants, ibex, aurochs, rams, bulls; these bony protrusions are always conoidal, like our modern horns. In Europe, the tools were used for a number of functions: by night watchmen and firemen to sound warnings of fire or other danger, or simply to sound the hour; bakers would blow the horn to alert nearby villagers that the day’s baking was ready for sale. In the fields, they were used to control herding animals and fend off predators or, among other uses, to sonolocate during hunting.

In Europe, horns have had a long and strong association with chivalrous and aristocratic practices hunting (la chasse, hence cor de chasse or later, trompe de chasse, as referenced in Messiaen’s solo; also called la vénerie), reflected in both visual iconographic evidence as well as

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110 Some cultures have also developed whistling languages to communicate in coded sound across distance. See LaBelle, Lexicon of the Mouth, 174–6, 181–2.
112 Baines notes (Brass Instruments, 47) that in Sweden and elsewhere in northern Europe, rare examples with fingerholes (anticipating the Renaissance cornetto) have been found, which would likely have been used only for music-making.
in the soundscapes painted by vocal part-song. Some of the earliest examples of horn sounding are found in Italian *caccia* of the late fourteenth century, and so may present one of the first instances in which the *phoné* of the horn was notated, even only if in translation for the human voice. Paradoxically, our best indication as to what horns in the hunting soundscape may have sounded like was by their vocal imitators. Baines cites Ghirardello da Firenze’s “Tosto che l’alba” (ca. 1350) written around mid-century, where, following the text “suo corno sonava,” the voice engages in figures a fourth apart, implied leaps from p3 to p4.\(^{113}\) Lorenzo da Firenze’s *caccia* “A poste messe” (ex. 3.3) engages in a similar device.

Example 3.3. Lorenzo da Firenze, “A poste messe” (before 1373), trans. Jordan Alexander Key\(^{114}\)

Where before the voices were fairly scalar, after the text “A ricolta… sança corno” (ironically, *without horn*), the voice sings implied p2, p3, and p4 under various syllables including *ta*, *tin*, and *to*.

The first examples of pedagogy for the desiring hornist are found not in ostensibly *musical* treatises, but in *hunting* treatises dating from about the same time as these *caccie*, in the late fourteenth century. As a preface to *Tresor de Vanerie* (*Le Trésor de Vénerie*), a hunting treatise figured in verse, Hardouin de Fontaines Guérin provides what is also an early horn

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treatise. The engravings depict various scenes accompanied by a kind of notation of hunting horn sounding that is then shared with desiring cornistes; in figure 3.1, both author-qua-teacher and students are depicted with short, arched, conical horns slung at their side. Hardouin calls these instruments simply cors (horns), but they would become known as cors de chasse (hunting horns).

Figure 3.1. Hardouin, Le Tresor de Venerie, “L’Ystoire du Maistre” (1394)\(^{117}\)


\(^{116}\) In German, these would be called Hifthorn, Helbmondhorn (literally “half-moon horn”) or Flügelhorn when made of metal; the latter two would become associated more with the conical bugle, and take a different path than the hunting instruments described above.

\(^{117}\) Hardouin, Le Tresor de Venerie, 13.
We can observe in Hardouin’s notation the six rhythmic values and groupings the master describes; he uses the term mos (sing. mot, the term for word) for these rhythmic motifs or cells, implying a kind of lexicon, though their exact meanings or translation into durational sound has been lost to memory. The subsequent poems describe the purpose of each sounding (cornure), which are in turn conveyed both in the versed text as well as in the wood cuts with tablature, for each of fourteen events in the hunt. The presentation of both the event and sound content of the accompanying call in metered, rhyming verse facilitates their memorization and recall for the corniste. For Hardouin—and for generations of French hunters to the present day—the voice of horn is intimately bound up with the hunt, signaling its beginning, its ending, and any number of events in between; indeed, Hardouin opens the hunting treatise proper with the expectation that the reader will have studied the cornures (horn calls) thoroughly.

As hunting became more codified and sporting—an increasingly favorite pastime at Versailles and for the English court—Jacques de Fouilloux adopted more traditional musical notation to present rhythmic duration, and adds the possibility of two pitches, a higher gresle and lower gros. The 1561 treatise also includes the use of syllables (such as tranc) to impart quality of articulation—directly describing, even encoding labial and lingual action—the techné of soma—much in the manner we explored in earlier, and as implied in the part-songs. One such

118 I hesitate to use the word “tablature” here, since the boxes refer to echos and not instructions for instrumental soma, as guitar tablature does.

119 The groupings and shading of boxes correspond to the six mos of Hardouin’s lexicon (demonstrated in fig. 3.1, numbered from bottom to top, left to right). Edward Bühle assigns these rhythmic values in Musikalische Instrumente in den Miniaturen des frühen Mittelalters (Leipzig: Brietkopf and Hartel, 1903), 23; summarized in Anneke Scott, “Measures to Wynde the Horn: Early Horn Notation,” The Consort 69 (2013): 25. (1) short black squares are sengles, which are equivalent to quarter notes; (2) two white squares are demi-doubles-de-chemin (two eighth notes), where (3) four black squares are a double-de-chemin (four eighth notes); (4) the composite figure of one black square with two white squares is a double-de-chasse (quarter followed by two eighths); (5) long solid rectangles are longs (whole notes); and (6) the composite double-de-chasse with long is an apel tennent (quarter, two eighths, and a long). Though the cor de chasse could likely sound a few different notes, there is no indication in Hardouin that more than one pitch was used.

120 Hardouin, Le Tresor de Vanerie, 27.

121 For a review of early horn notation more broadly, see Anneke Scott, “Measures to Wynde the Horn.”
complex found in later tutors is Ta-vere: the embodied action of this morpheme includes both a shift in tongue position and, in the implied fricative consonant, an articulation. For the hornist, this would not only mimic but provoke an increase in air speed, and thus a rise in pitch, either through lipping a wide-enveloped low partial up a fourth or fifth or by ascending “over the break,” as it were, to another partial on the instrument.122

It takes a longer instrument to make more than a few pitches possible. Manufacturing instruments from metal (rather than using found objects with determined lengths) allowed for longer instruments, with a lower fundamental and easier and more pragmatic access to the instrument’s higher partials, assuming the player developed some means of pitch selection—an embouchure. The flexibility and relative durability of metal also allows it to be bent into more convenient shapes; the instrument’s tube—previously determined by nature and the animal or plant’s soma—can be bent or coiled by hand, and could then afford a greater length instrument within a narrower space.123 The shorter cors de chasse added a small coil mid-bore, and then two. By the early seventeenth century, Mersenne’s Harmonie Universelle and other early organological texts, along with other engravings, show tightly coiled trumpets and horns with increasing turns—Mersenne (fig. 3.2) pictures one cor à pleusiers tours with a remarkable seven

122 Eric Halfpenny, “Tantivy: An Exposition of the ‘Ancient Hunting Notes,’” Proceedings of the Royal Musical Association 80, no. 1 (February 1954): 43–58. Baines (Brass Instruments, 147) notes that rather than two distinct partials, horn blowers may have used the wide envelope afforded by the lower partials to hit the note well below pitch and scoop up a fourth or fifth within the same partial. This is the ‘lipping’ technique described in the introduction, of the sort expected for a cor basse in the eighteenth century and used, for example, in Beethoven’s Op. 17 sonata, and which requires considerable choreography behind the lips.
123 For example, Baines notes that “a 12 cm. diameter loop is all that is needed to reduce a 75 cm. tube to an overall size of about 30 cm” (Brass Instruments, 148). Michael Praetorius, Syntagma Musicum. Theatrum Instrumentorum (Wolfenbüttel, 1620). Compare the four-coiled Jagertrommer on plate VIII, pictured with sackbuts and cornetos, with the Jagerhorn examples on plate XXII, both arched and single coiled types, pictured with tambourine, triangle, bells, and hurdy gurdy.
coils—alongside the simpler half-moon examples.\footnote{Sebastian Virdung, \textit{Musica Getutscht} (Basel, 1511) shows, among a selection of ‘popular’ or ‘folk’ instruments, an arched hunting horn and a spiraled instrument, which Baines supposes would have been made out of porcelain or earthenware (in Baines, \textit{Brass Instruments}, 139). The practice of winding or spiraling labrosones for size convenience creates some problems in nomenclature: there are spiraled trumpets, with relatively cylindrical bore throughout, that have the visual \textit{form} of the wound horn (with relatively conoidal bore), but the distinctions between these instruments is not cut-and-dry (see Appendix A for these designations in the original H-S system). Baines notes (Ibid., 143) it is likely that in Germany the term ‘trumpet’ was used for any folded hunting instrument, where ‘horn’ was only used for the simple curved horn until the adoption of the large-hooped trompe as Waldhorn.}

His treatise also includes the compass of the natural trumpet in standard notation—showing partials 1 to 13—and provides notated examples of some military signals up to p10, and syllabic articulation.\footnote{Marin Mersenne, “Des Instruments à Vent,” in \textit{Harmonie Universelle}, Part 2, Book V (Paris: Pierre Ballard, 1637), 245.} These trumpets would have likely been ‘7-foot’ D trumpets, thus approaching the ‘8-foot’ C where we began our discussion of brass instrument technique in the introduction.

\footnote{Marin Mersenne, “Des Instruments à Vent,” 244–282. Mersenne includes some description of hunting music, but is more thorough with military calls, including some transcribed only in partials (265). He also describes a trumpet}
The Library of Congress holds a fascinating manuscript from 1660s Paris, a few decades after Mersenne’s treatise. The small manuscript book holds three distinct repertoires—unaccompanied viol suites, dance pieces for treble instrument, and twenty-five horn signals—written in five different hands. (In his introduction to the facsimile, Stuart Cheney proposes that the manuscript belonged to an apprentice who worked with three specialists.) The horn signals are represented first as syllables such as ta, ha, and ti written directly upon the staff in one hand—assumed to be that of Jacques Chrestien, an instrument maker whose workshop had supplied the royal hunting instruments since Henri IV—and transcribed into more conventional musical notation by another. The twenty five calls use up to five distinct partials—p3, p4, p5, p6, p8—as can be observed in the “Fanfare de Trompette” and the “Apel” below.

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\[\text{mute for softening the instrument’s sound (260), what might be the ancestor to horn mutestopping, and therefore handstopping. This section includes propositions on the hunting horn—examples include arched, single coil, and a remarkable seven coiled example, the (folded) trumpet, the sackbut (also called trompette harmonique), cornetto, and serpent.}\]


Figure 3.3. “Fanfare de trompette” and “Apel,” from unsigned manuscript book (Paris, 1660s)\textsuperscript{129}

The trompe de chasse refers most specifically to long, large-hooped hunting horns of the French hunting tradition which were developed and standardized by makers such as Chrestien in the early eighteenth century. The four-and-a-half meter length instruments—pitched in D, almost double the length of the trumpets above—featured fewer turns than Mersenne and Praetorius’s examples, but the large diameter of the single or double hoop allowed the instrument to be easily slung over the trompeur’s body while on horseback.

\textsuperscript{129} Ibid., 88.
When events needed reporting, the horn was removed from around the body and held aloft by the straightened or bent arm, the bell pointing *behind* the player to better afford the party behind them to hear their call.

These very long instruments afford a yet higher range, ascending to p12 or above. As a result, the calls written down by André Danican Philador the Elder (ca. 1705), a musician and composer of at the French Royal Chapel, and later expanded and developed by the master of hunting at Versailles, Marc-Antoine the Marquis de Dampierre (ca. 1735), are much more complex than Hardouin’s combinations of single-pitched *mos*. By taking advantage of musical notation’s archival affordances, today’s *sonneurs*—who typically play more practical horns with three turns and a smaller hoop diameter, but retain the length of Dampierre’s magnificent
example—have an expansive repertoire of thousands of melodies and fanfares, which requires, of course, a highly practiced embouchure.

![Example](image)

Example 3.4. Marquis de Dampierre (attr.), “Le laisse coure royal”

As we can observe in this call that is sounded when the quarry is struck (ex. 3.4), trompe calls tend to favor partials 8 through 12, and thus sound fairly diatonic and melodic with step-wise motion and short leaps. Partial 7 is avoided, as with the orchestral horn, but partial 11—which sounds between the written F and F-sharp—is uncorrected. Despite their presentation in musical notation, Dampierre’s calls return us to the notion of the horn blower’s parts as tablature, where notated pitches refer as much to locations on the instrument—and actions of the embouchure—as to their sonic results.

Though it may look complete to our hearing eyes, the call as written is subject to a number of ornamentations in an orally-codified style referred to as *ton de vénérie*; that is, in contemporary trompe practice, the written document is incomplete and subject to codified ludosonic amplification. The rhythms are highly stylized, with durations deviating from standard proportionality, and repeated eighth notes are given a swung feel; the starting pitches of many phrases are preceded by an ornament called *hourvari*, a quick glissando upward through several partials to the notated pitch, and pitches within the line are often decorated with upward doits. The articulating, articulated tongue is used not only to start pitches, but often to end them (we might think here of de Fouilloux’s *tranc*). The tone is spectacularly strident—designed to cover

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great distance—by virtue of the narrowness of bore and bell, the thin rim and shallow cup of the mouthpiece, and the lack of hand in the bell, since the instrument is held over the elbow. The trompeur’s embouchure—like the opera singer’s vocal instrument—has cultivated great amplitude and its carrying sound is rimmed with a wide vibrato.

While hunting instruments certainly command attention by the force of their echos, made further possible by developments in the player’s and the instrument’s topos and combined techné, the function of hunting instruments’ phoné in the soundscape of the hunt is to communicate particular meaning—logos—between its constituents. The calls blown by the sonneur signal that a particular event has or will take place: that the hunting party is to leave in the morning, that the quarry has been sighted and details as to its type (whether boar, doe, or stag), when it has leapt into the water and emerged again, when to strike and when to send aid. There are shorter calls whose logos is directed at the dogs, and longer, more complex calls to the human hunters. For the quarry, the trompeur’s echos communicates a threatening human presence.

As modern practitioners will attest, when trompeurs blow the trompe, the verb is not “to play” (or jouer), in the sense that one plays other musical instruments such as the piano, the violin, or even the orchestral horn. Rather, on sonne de trompe: one sounds the trompe—with the sense that the sound is waiting, within the horn, to be provoked. Historically, we have also

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131 This is actually the first sentence of an application prepared by the Fédération Internationale de Trompes de France, the largest organization for the preservation and maintenance of the trompe de chasse tradition and la venerie more generally, for L’art du sonneurs de trompe to be granted the status of Intangible Cultural Heritage in France: “Les instrumentistes s’appellent entre eux « sonneurs de trompe » : on ne « joue » pas de la trompe, on « sonne » de la trompe” (Fédération Internationale de Trompes de France, “L’art Du Sonneurs de Trompe,” 2014, http://www.culture.gouv.fr/content/download/115269/1312229/version/1/file/Fiche+Art+des+sonneurs+de+trompe+-DEF-%281%29.pdf, 3).
blown and wynded the horn, wir haben der Horn geblasen. For Hardouin, the verb was simply corner—to horn.\textsuperscript{132}

But when did we stop blowing and start playing?\textsuperscript{133}

While the cornetto and sackbut—cylindrical lip-activated aerophones made chromatic by use of fingerholes and slides—were already indoors in order to accompany church choirs, the horn remained an outdoor instrument for some time, even when it was brought into the concert hall: the horn was likely first evoked by strings—as in Cavalli’s “Call to the Hunt” (\textit{Le Nozze de Teti e di Peleo}, 1639)—or later in Lully’s “Air des valets de chien et des chasseurs avec Cors de chasse” (\textit{La Princesse d’Elide}, 1664); these calls are also found in the earliest French collections for the trompe, published in 1705. The hooped horns might have made occasional appearance as a supernumary member of the ensemble, blown as an index of the wilderness, of the thrill of the hunt—a bit of aural stagecraft, a noisy signal to the audience that the action was taking place outdoors—but were not yet musically fluent or sociable enough for permanent membership in the sinfonia.\textsuperscript{134}

These trompes were the horns that a young Count Franz Anton von Spork heard at Versailles in 1681 and desired for his court orchestra in Bohemia. (Incidentally, he also founded

\textsuperscript{132} Interestingly, Hardouin never uses the noun cor. Rather, the consistent use of the verb corner points to action between player and instrument.

\textsuperscript{133} Also as in babbling to speaking; as Eidsheim describes, “Thus the phoneme combinations and signifiers mama and papa can be conceived not only as words, but also as the voicing of experimentation, play, and the mechanical functions of the body.” These experimental voicings are then—and here she cites Jakobson—“\textit{deliberately adapted to the infant’s phonemic pattern and the usual make-up of his early words}” (\textit{Sensing Sound}, 123; emphasis in the original).

\textsuperscript{134} Horn historians cannot, it seems, agree on whether these fanfares would have been performed on string instruments or upon actual horns. Given appropriate stage imagery, it mightn’t have mattered which instrument these simple triadic calls were performed on: as we examined in the first two chapters, through topical transfer, any number of instruments can “become” horns. Baines suggests—by virtue of similarity to (unpitched) examples in de Fouilloux and Mersenne—that Cavalli’s and Lully’s fanfares may present a record of realism (Baines, \textit{Brass Instruments}, 150).
the Venerable Order of Saint Hubertus in 1695—a now international fraternal organization named for the patron saint of hunting that preserves traditional hunting methods and ethics—as well as the first permanent opera theater in Bohemia, the Prague Theater, in the early eighteenth century.) He brought a *trompe* home with him and sent his servants Wenzel Sweda and Peter Röllig to study at Versailles; upon their return, the smaller hooped *trompe Dauphins* in tow, they began the great tradition of Bohemian horn playing and the “singing style” that would ultimately include the likes of Anton Hampel and Punto—and the *techné* of the hand—and bring the horn into the orchestral fold.135

In general, we can trace a trajectory from *oral* culture of a few short, easily memorized calls to a rich repertoire of *written*, complex, literate calls—all afforded and encouraged by developments in both bodily and material instruments, and bolstered by a propensity to notate them. They are first brought into the musical polity for their iconicity and, at times, even the *logocentric* content of their phoné; soon they discover the potential musical expressiveness of their *echos* otherwise, which, as we observed in the Brahms, is both enabled by and enables shifts of *techné* in the hornist’s instrumental *topos* and executing *soma*. Somewhere along the way, we move from *blowing a horn to convey our message* toward *playing the horn for the embodiment of the composer’s phoné*, hornistic or not.

At times, however, the horn calls out again seemingly from nowhere—from *over there*—as is the case in *Des Canyons*, where the hornist also intones the canyon wren in other movements. Horns playing *real* calls are quite difficult to tame; as Monelle observes of the very

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135 The horn calls in the Autumn (*Der Herbst*) section of Haydn’s *The Seasons* (Hob. XXI:3) are, as Monelle traces, fairly accurate, and more likely gleaned from the hunting field than any single printed source (Raymond Monelle, *The Musical Topic: Hunt, Military and Pastoral* (Bloomington: Indiana University Press, 2006, 77–9). Monelle is able to trace an entire narrative of the chorus “Hört das laute Getöns” through the signals the calls give.
accurate horn signals in Haydn’s *The Seasons*, they do not seem to merge with the ensemble, but rather, “like the gramophone record of a nightingale in Respighi’s *Pini de Roma*, these calls are hardly more than untreated extraneous sounds.”¹³⁶

“Going Back to Its Original Nature”

That the solo is called “Appel interstellaire” is provocative because, rarely enough in Messiaen’s output, it names a genre: a call. As we have seen, the capacity of many beings—from birds to hornists—for signal is often termed calling, their phonic utterances named calls.¹³⁷

Messiaen describes the middle section of the arch-form movement, the emotional climax:

Then the cries burst into the stillness. *Glissando* on harmonics of D. *Accelerando–rallentando* of the Cañon Wren, for the second time in the entire work. The French horn takes the fingering of the horn in D, going back to its original nature: the hunting horn. Its calls become more and more hoarse and heart-rending: no answer! The calls are lost in the silence….¹³⁸

His description describes technical, musical details as well as posing a narrative, dramatistic teleology. In this section, Messiaen brings the canyon wren and the hornist into dialectic relationship under the synthetic heading of *cries*. The canyon wren citation (mm. 32–33, discussed above) locates the listener geographically: *Catherpus mexicanus* (*Troglodyte des canyons*) is only found in the North American west, from northern Mexico to southern Canada, and its cascading territorial song is a salient part of the soundscape in Utah’s canyons.

¹³⁶ Such as in the third movement, “Ce qui est écrit sur les étoiles.” Importantly, this intonation is at same pitch level as that in the “Appel,” implying an absolute or fixed entity that is closed to development, as a recording might be.

¹³⁷ The title of the International Horn Society’s journal is *The Horn Call*.

*Calling* is an action that can be taken up by any number of instrumental agents: beyond “musical” horns, the klaxon horn on a car or the fog horn, the human voice, or, for that matter, Messiaen’s beloved birds.

*Sonneries de trompe*, then, would seem to be closer to bird *song* in sonic style and aesthetic practice, but function, in practice, in the same communicative manner as *calls* in historic usage.

¹³⁸ Messiaen, liner notes to Erato recording of *Des Canyons aux étoiles*....
For the gestures marked *comme la trompe de chasse* (mm. 27–31, as shown in ex. 3.5 and also in mm. 36–41, reordered), the hornist (not merely the horn-*qua-*musician) depresses the first and second valves, and the metal conoidal tube lengthens to four and a half meters. The horn is fashioned into a horn in D, the same length and material as Dampierre’s *trompe* (cf. appendix B). The *topos* of the valved horn *remembers* the horn in D, its corpus contained within its corpus: the horn is “going back to its original nature.”140 The orchestral hornist moves toward—recalls, reembodies—the *trompeur*, playing a horn in D (*topos*) and, it is implied, reaching back through domesticated concert-hall shaped technique to a more strident quality of sound (*echos*).

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139 Messiaen, *Des Canyons aux étoiles...*, score, 158.
140 There remain material distinctions between the two: the *trompe* has a narrower bore and smaller bell than modern orchestral instruments, and the mouthpiece usually has a thinner rim and a shallower cup, which aids the in the production of its characteristic strident sound as opposed to the mellow, domesticated Romantic horn. Additionally, the *sonneur*’s embouchure is generally reversed, proportionally, from the orchestral player’s standard: most orchestral players place the mouthpiece so that there is a majority of upper lip in the mouthpiece, *trompeurs* tend to place more lower lip (cf. fig. 3.5, below).

While distinct at the surface level of *topos*—not least through the visible form of the instrument—the shared horn in D and sounding by means of embouchure is vastly more similar than different, and *echos* is, as much as possible, reconciled. This is, of course, facilitated by the orchestral hornist’s bodily *techné*. 

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The pattern of sounds is less “musical” than Messiaen’s song or the complex codes of Dampierre’s *sonneries*; rather, they are short gestures, motives defined as much by rhythm as by pitch, which are crystalized to partials 8, 6, and the marked 11. The effect is closer to the rhythmic, syllabic motives of the earlier *cors de chasse*, saying *ton ta-verne! tay-aut, tay-aut, tay-aut, tay-aut!* This may be Messiaen’s “deforming prism” at work—his compositional voice distorting the *trompeur* fanfare in the same manner as he stretches and recomposes birdsong—or it may be that the hornistic persona actualized reaches back even farther than Messiaen imagined. The glissando blown through the partials of the D horn, however, is reminiscent of the contemporary *trompeur’s* ornamental *hourvari*, which launches the re-valved, chromatic hornist into fingered, flowing song.

Let us return to the psychological aspects of voicelikeness outlined in Schubert and Wolfe’s review. Recall that infants develop, as a result of experience, expertise, and enculturation, specialized neural pathways for attending to the human voice; these “shared action-perception circuits” afford the “natural supremacy” that Cone—or all of us—grant the human voice. But we also develop these habits in our sustained and intimate encounters with our instruments. Thus through a trained, habituated, and shared action-perception circuit I can *feel* a fellow hornist’s voice much like I can feel my own; I can witness her phonation. In this way, while I can never be a bird, when I sound *comme la trompe de chasse*, my interlocutors expand even further, to the *trompeur*, the *piqueur*, the coach hornist, the firewatchman.

In sympathy with Eidsheim’s music-as-action orientation, hornist Richard Deane writes in his method that notes are not sounds, *per se*, but vibration speeds of the lips that work in a
cooperative regime of oscillation with the harmonic series of the horn to which it is coupled. That is, phoné is not echos but, first and foremost, sympathetic intermaterial vibrations of soma—intercorporeal techné. From this perspective, the modern orchestral hornist and the trompeur are brought into bodily co-location by the action of lip against lip, lip to mouthpiece, and lip to horn in D, and resounding (and re-sounding) together.

This becomes especially apparent when modern hornists take their instruments out of the reified spaces of the concert hall to sound them again outdoors as several hornists (myself included) have done with Messiaen’s “Appel.” It seems natural: we go to the canyons that inspired Messiaen’s symphonic poem in toto, like we might go to the Beethoven Haus; or to experience the canyon’s echos just as we might visit the Hanover Rooms for which Haydn’s English sonatas were written. We end up remembering that a horn was a signal instrument—that it carried its own sounding logos—long before Messiaen composed for us. A Ventilhorn can be played as if it were a Waldhorn, but to repatriate the orchestral horn thus is to touch much deeper roots. It reminds us of when the horn-blower’s purpose was not musical, artistic, or

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141 Deane, The Efficient Approach, 35.
143 Hornists will sometimes perform the “Appel interstellaire” in proximity to a piano with the sustain pedal held open so that the sympathetic resonance of the strings creates the kind of echoes imagined (or experienced) in a canyon, or at least giving a kind of halo on the hornist’s pitch (a techné of distributing of topos yielding echoic effect). This does not appear to have been suggested by Messiaen.

Because the horn’s characteristic timbre has a particularly balanced and complete set of overtones and because the instrument is rear-facing and at approximately the height of the piano body for a standing hornist of average height, this effect is particularly potent with the horn, and is called for in several contemporary works for horn and piano. The intermaterial vibration that gives rise to the effect is, however, problematic for performing common practice repertoire with a modern piano, as unintended resonance can easily occur and muddy the aural result. The hornist must be careful to point their bell away from the piano and the pianist must be careful to not hold the sustain pedal open when unnecessary. Sympathetic resonance is also particularly audible between horns and snare drums with the snares turned on, or with certain types of institutional light fixtures.
aesthetic, rather, it was participating in an ancient cultural technique of signaling: communication in sound—or in other action—across distance.

By evoking various kinds of aural signaling and sounding, Messiaen’s solo implies—indeed, reminds us—that the orchestral hornist can be more than only musical. We can call like a bird, and our mouths can reenliven the old syllables, the old horn calls. She labors to create soundings human, aviary, vocalic and instrumental, working through sound objects at once ancient and modern, organizing her embouchure to make them sound, to envoice them. And she is—regardless of whether upon the valved orchestral instrument, the trompe, the Oliphant, the posthorn, the cowshorn, or the alphorn, sounding composer’s voices or more functional phoné—at all times horning, linked to a host of ancestors, named and unnamed, by the need to express and finding, with the horn pressed to her lips, her voice.144

“Let my cry find no resting place!”

Like many movements of Des Canyons, the “Appel” movement is prefaced in the published score with epigraphs of spiritual significance.145 A citation from Psalms refers to God’s healing and redemption of humanity (“He heals the broken hearted and binds up their wounds”). His omnipotence and omniscience is made concrete in allusion to the starry firmament: “He determines the number of the stars and gives to all of them their names.” Or, depending on the translation: “He calls them all by name.”

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144 When conch shell is called for in the orchestra, such as in Revueltas’s La noche de los Mayas, it is blown by a percussionist due to the instrument’s status as supernumerary or auxiliary. Regardless, the percussionist becomes, for all intents and purposes, a hornist. More nuanced might be the imitation of the conch shell—performed by the trombonist—in Carlos Chavez’s chamber work Xochipilli: An Imagined Aztec Music.

145 Psalm 147: 3–4; Job 16:18.
The other epigraph is taken from the book of Job, and is a quotation from the long suffering protagonist, in which he beseeches: “O earth, cover not my blood, and let my cry find no resting place!...” This is not a citation from the Book of Job in which a distant narrator recounts the story in the third person, but rather a statement from the long-suffering titular protagonist himself. Somewhere between the astrological and geological, the theological and the ornithological significances of the tone poem—of Messiaen’s compositional preoccupations—sounds the human actor beset by the fear of suffering and death, crying out to make his presence known. Is the hornist to empathize with Job and to bear bodily witness to his sounding against the threat of his own ephemerality, the cries that erupt from his throat? Does she portray him, embody him, take his phōné as her own? Is she not, at the very least here before us, incarnate, asking for recognition, for us to recognize ourselves in her?

It becomes a question of figure-ground relationships: by attending to one point of focus (the horn, the composer), other aspects of music (bodies, players) recede to our peripheral vision. In Romantic landscape painting, for example, human figures moved from being the subject,

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146 Cone (Composer’s Voice, 105): “In considering the relationships between instrumental agents and the players who bring them to life, one must never forget that the agents are, after all, only virtual. They are not embodied by their performers as vocal personas are. The singer enacts a role, portrays a character. The instrumental performer, too, is in part an actor, but one that symbolically personifies the agent of which his instrument in turn is but the concrete vehicle—for, once more, the instrument as sound, not as object, is the locus of the agent.”

Cone might argue that my academic performance here is similar to some musical works of the avant-garde in which the histrionic element is so strong that the instrumentalists have become full-fledged play actors” more dramatico-musical than musical, and no longer symbolize virtual agents but rather portray characters. “True, as characters they may be called upon to play their instruments; their real job, however, is not he playing but the impersonation. For as characters they are likely to have to do a number of things besides simply playing: to improvise, to record their own performances, to playing against recordings of their own performance, to use their instruments for unusual purposes, and to do things completely unrelated to their musical abilities. Whether an implicit musical persona can take shape at all under such circumstances is doubtful” (Ibid., 112).

I would counter that, in the moments when the horn-cum-horn becomes most present-to-hand, a hornist is always portraying a hornist, such as in the second horn solo of the Eroica, or in the horn fifths passage of the Brahms Trio, or here, in an “Interstellar Call”; she—and we as listeners—do not need to make recourse to an “implicit” persona in these moments.
central to the work, to a point of reference, inhabitants of that sublime scape that put its vastness into perspective. Hearing the horn’s *echos* from a distance performs a similar purpose in the aural, musical landscape. We associate its *phoné* with the trees of the forest, the thrill of the hunt, the mountains or the cows, with times past; it is not, by many measures, particularly *voicelike*. We may deny in her *phoné* her incarnation, identity, keeping her agency only virtual. But let us never forget that the hornist on the other side of that distance is always another human at the instrument, differently though no less instrumental than the singer—and, in calling to us across the distance, she asks to be heard, to be recognized.

In the end, the focus is less on what constitutes a voice, or grants the phenomenon of voicelikeness, than it is attention to how—and to what—we *grant* voice, and to what we attend once so envoiced. For *everything has* a voice, Ihde notes:

> But individual things might well remain silent, their voices not active. Yet each thing can be given a voice. The rock struck, sounds in a voice; the footstep in the sand speaks muffled sound. Here, however, we must note that the voices of things that are often silent are made to sound only in duets or more complex polyphonies. *When I strike a lectern you hear both the voice of the lectern and of my knuckle.* When I use a pen to strike the water pitcher, you hear both the sound of the glass and of the plastic, simultaneously in a duet of voices of things.

> We have to sharpen our perception to attend to one member of the duet.  

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147 Charles Rosen, *The Romantic Generation* (Cambridge, MA: Harvard University Press, 1998), 150–66. Idhe also notes: “It now seems strange to us that prior to the nineteenth century in the West, mountains were not often seen as beautiful, but rather as threatening, as blocking, as foreboding, until the landscapists domesticated them and made them objects of beauty. Or, take the now seemingly silly practice of the nineteenth century in which framing landscapes became a passion, with travelers regularly looking at the scenery through an oblong wire frame, thereby creating a framed, picture-like landscape. But perhaps this is little different than our contemporary artists who now go about draping coastlines and islands in plastic, thereby transforming the landscape into a kind of art object” (“Phenomenology of the Voice,” 189).

148 “Phenomenology of the Voice,” 190; emphasis added.
Unlike the instrument—and unlike the work—“itself,” the musical lip and the performance must be made anew with each player. It is to the player’s *soma* I have primarily attended in this chapter, the (my) knuckle on the lectern. But, as we observe here and also in Cusick, Le Guin, and Beghin’s work, the instrument (as *topos-echos*) and the work (as *logos-echos*) act back upon the body (*soma*), giving a point around which to *organize* and choreograph past and future *phoné*.

In the case of the hornist, the flesh of lip is supported by the musculature of the face as well as the bone structure of the teeth, jaw, and cheek bones, pressed upon by air, mucus, saliva, that are all *expressed* in the act of horning. But I must grant agency again to the horn, for the mouthpiece and the mouthpiece and horn also act *back*. The horn not only amplifies the vibration of my lips but also adjusts their frequency by introducing resistance, guiding them toward resonant nodes and anti-nodes; the production of clear, characteristic sound is in the sympathetic coupling of the two. The bell of the instrument radiates sound outward, to listening ears but also to other waiting bodies—drum snares, light fixtures that sympathetically vibrate, to canyon walls that throw my sound back to me as echoes. We are a polyphony.

The bell also *captures sound* like an ear—or an ear trumpet—funneling the vibrations back to the lips. Yet without any resonance—such as in a small practice room, an overly carpeted space, or when playing into a curtain—it is also difficult to play, since the bell’s capturing can also *aid* the executant by setting up sympathetic vibrations. When the hornist is

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149 This is why hornists should never be seated in front of the timpani in orchestral settings: not only do the hornists risk damaging the timpanist’s hearing—since our bells point backward—and vice versa, but the sound waves emitted from the kettle drums—which are typically set at the same height as the hornists’ bells—are captured by the bell. As research shows, the horn acts as an acoustic impedance device in both *directions*, creating sound pressure changes of around 20 dB. As such, the hornists’ embouchures must battle to maintain their independent vibration as the timpani strokes introduce destructive interference—especially if the horn and timpani are not in tune with one another—and fatigue sets in much more quickly. See Jer-Ming Chen, John Smith, and Joe Wolfe, “The Effect of Nearby Timpani Strokes on Horn Playing,” *The Journal of the Acoustical Society of America* 135, no. 1 (January 14, 2014): 472–478.
tapped into such resonance—such as in a well-tuned horn section—it becomes easier for both the ear and the lip to pick out overtones, and thus partials.

More intimately, the rim of the mouthpiece provides a material aid for and reduces—a *techné* that redistributes—some of the *topos* of embouchure construction: the buzz I make with lips alone and its surrounding structure is not exactly (or can be quite different from) that which I make with the mouthpiece.\(^{150}\) This may be why, in all of the images in Farkas’s embouchure study *The Art of Brass Playing*, each player’s apparatus is photographed coupled with a detached mouthpiece rim (called an “embouchure visualizer”.)

![Figure 3.5. The author’s embouchure, with embouchure visualizer](image)

The mouthpiece shapes and distributes a bit of the labor of my embouchure, but more crucially funnels my air—and the vibrations of my lips at its rim—into the exceedingly narrow leadpipe of the instrument.\(^{151}\) It not only delivers sound, but, like the supralaryngal apparatus of the singer, molds the vibration through the contouring of cup, throat, and backbore before

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\(^{150}\) For this reason, the status and usefulness of free buzzing as a training technique is somewhat contested: some teachers advocate its usefulness in moderation, where others deny the benefit of action uncoupled from the mouthpiece.

\(^{151}\) Horn mouthpieces are historically more funnel-shaped than those of trumpets, trombones, or tuba, reflecting in reverse the relatively conoidal shape of the horn’s bore. This is even more exaggerated in the case of the French *trompe de chasse*; however, alphorns, which are almost perfectly conical, use a relatively more cup-shaped mouthpiece, but one that is also typically wider in diameter.
entering the instrument’s tube. When the air column contained in the instrument is thus set in motion, it sets up resonant standing waves, oscillating between nodes and anti-nodes within the horn’s tube. My labor here also breaks in the horn despite the seeming solidity of its metal, settling itself against the work of my body, shifting its construction in tiny ways. Together, we settle into grooved patterns to throw the sound further than my lips or voice alone could ever manage. And the mouthpiece presses back upon my lips: I can feel the imprint of the rim etched into my flesh, a presence even in its absence—a phantom limb.

Our experience of music is always mediated through materiality, through instrumental technology of prosthetic instrument, bodily apparatus, and room, multiply located and distributed and exerting its own agencies. Moreover, music is materiality: touching upon touching, action begetting action and re-action, music(ing) is, as Eidsheim concludes, a specifically vibrational and intervibrational practice. Music sets up patterns, grooves: these are not only figured in the proportional rhythms written on the page but in the micro-movements and high frequency cycling of lips, vocal folds, strings, and other membranes; in the repetition and reperformance of the work, of the repertoire; in the cycle of birth, life, and death, of centuries, of millennia.

I do, therefore I am. These habituated actions, performances and reperformances of and in musicking become so familiar to my sense of being in the world that I have no choice but to claim it as an identity, a tenuous, vibrational consistency of being forged at the meeting of my body and my instrument: a Hornist. My subjectivity is always intersubjective; my corporeality always intercorporeal. Me/It, corps à cor à corps: Us. And, like all voices, our phoné works at

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152 Farkas also makes the comparison that “The horn is just like the horn on the old-fashioned phonograph, an amplifier. It magnifies the vibration of the lips at the same time vibrating in sympathy with them and adding its own tonal characteristics (The Art of Horn Playing, 19).

153 Recall, too, Cusick’s description of her musical identity from the introduction.
and across the boundaries of the human and the technological, bringing and challenging forth, a constant project of expansion and expression, counterpoised with internalization and impression. There is no inside nor outside to incorporated instrumentality: I interpolate breath at the same time I ring the canyons.

This repetition—these habituated techné and the feedback loops they actualize—can foreclose certain possibilities for our phoné at all levels: our playful mouths forget how to form certain phonemes, we believe the horn is an always-already chromatic instrument, we attend more to the composer’s voice and to homosocial soundings than to others. As we will see in the next chapter, the incorporated, embodied instrumentalist has much to say by virtue of her somatechnics, an emerging line of inquiry from critical and cultural theory that examines how the embodied subject is shaped by and shaping the techné of the world.

In interviews following the premiere of Des Canyons aux étoiles..., Messiaen described the solo as “a questioning of misfortune and suffering” or alternately as a “call for help in the midst of the stars, to the void between the stars” that, in some readings, goes unanswered in the long silences, measure rests crowned with a fermata with the additional texted instruction long. Despite the “Appel” having begun as a complete, standalone work for horn solo, once Messiaen decided to fold it into the symphonic poem, he would insist—with a few exceptions—that the “Appel” be performed only in the context of Des Canyons. His rationale was poetic, for the complete musical persona of the work to provide rhetorical closure: to the cries of the third section is given his song again in the fourth, and, to the movement in total, “it can be said that

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the entire work answers it”—the hornist’s questioning or call—“by showing… the miraculous beauties of our planet and the hope of still greater beauties after death.”155

*Des Canyons aux étoiles*... has come to enjoy regular performances in orchestral concert halls. And, regardless of Messiaen’s interdiction, the “Appel interstellaire” has also lead a rich performance life following the premiere of the symphonic poem. Georges Barboteu, who visited the composition class before the work had even been conceived, played the solo in the French premiere of *Des Canyons*... in 1975 and on the first commercial recording of the work, and Daniel Bourgue, who premiered the original *Pièce pour cor*, reprised the work as a standalone solo several times—at least once with Messiaen’s blessing. Individual hornists have and continue to study and perform the “Appel” in recital halls, as test pieces and competition fare, and, yes, in the canyons.156 This is because the work gives a particular opportunity for display of hornistic phoné: the solo provides not only a provocative narrative for the hornist to play, to give form to the composer’s voice, but also because it shows, as Messiaen described, the range of techniques that the hornist can do. This is, in essence, how the solo ends in the fifth section: a reworking of the “effects particular to the instrument” of the first.

Perhaps a call was never something Messiaen would or could have ultimate ownership of—it may always evade his or anyone’s authority, no matter the force of his compositional voice, the ultimate supremacy of notation. While the full score of *Des Canyons* is available for purchase or from libraries, the notation for the sixth movement “Appel interstellaire”—from

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156 The “Appel” was used as a morceau de concours at the Paris Conservatoire—it must have been with Messiaen’s blessing—in 1986; the International Horn Competition of America has included the work in its lists of contemporary, unaccompanied repertoire since 2013 and in 2017 *required* the work in the professional division.
whence I have sourced my examples above—is notated in concert or sounding pitch. This requires the desiring hornist playing a horn in F to transpose on sight; this is not an impossible barrier, but an obstacle to facile performance nonetheless. The solo horn part for Des Canyons, which includes the transposed solo, is only available with a prohibitively expensive full rental. Rather, most hornists learn the solo from handwritten transcriptions made from the score or from photocopies of the rental part, passed down from teacher to student and circulating through collegial networks through idiosyncratic handwriting, subtle translations, and fading legacy copies.

For the very last sound of the “Appel,” the hornist is instructed to produce a long note with oscillations of pitch, the idiosyncratic peaked line carefully copied from Messiaen’s score:

\[
\begin{align*}
\text{Très lent (} \frac{1}{4} = 44) \\
\text{(son détérioré, irréel, avec des oscillations de hauteur)}
\end{align*}
\]

(ad lib.) \( \uparrow pp < pp \) (lent ou baisser à moitié, alternativement, les 3 pistons ou les 3 palettes)

Example 3.6. Messiaen, “Appel interstellaire,” mm. 67–8, score in C, horn

Messiaen provides technical, topographic instructions for its realization: raise or lower halfway the three pistons or valve levers. This extended technique—generally referred to as

\[\text{Figure 3.6. Messiaen, “Appel interstellaire,” mm. 67–8, copied from rental part and translated [by Judith Aston?] }^{157}\]

157 This is the part, given to me by my teacher Ann Ellsworth, from which I learned the “Appel” in 2015.
“half-valve”—has the effect of making the horn feel slippery: the envelopes of pitch afforded by the horn seem to widen, so the hornist’s *soma* takes on more of the labor of providing the oscillation of pitch. By a feat of “instrumental sabotage”—of *extending techné*—this “suppressed note” does not resonate in the silences as the horn’s brilliance usually would. Messiaen’s text in the score also describes the *echos* of this effect: a *son détimbré*, “detimbred,” a *sound that has lost its sound*.

This technique is actually used three times in the solo, as the penultimate measure of the first, third, and fifth sections, and, though it was relatively new in Messiaen’s day, continues to baffle hornists and audiences today, almost half a century later. It is an affordance only possible with the assumption of valves and of experimental approaches that desire to see what else the horn can do, beyond its normalized musicking; it is still relatively rare in the hornist’s repertoire. As a result, and despite Messiaen’s verbose description, almost every hornist that plays the “Appel” has a different approach to the gesture. The horn has lost its sound and the *hornist* must find another one.

This is not, however, a failure, but rather an opening for each hornist, for her interpretive—if not compositional—*incorporated voice*. In interviews, Messiaen described the resulting sound as a dog whining or a whale song, opening the *phoné* of human hornist toward animallikeness. When I have used my version of this *extended techné* in other, collaboratively developed works, my audience heard it as me mumbling—a function of the valves mushily articulating the airstream, as the lips or tongue might, but farther downstream—or even me *singing*, actually, through the horn.

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158 In the interview with Watts (“Canyons, Colors, and Birds,” 7), Messiaen described this technique as a “suppressed note.”
159 For a comparison of various approaches in commercial recordings, see [https://youtu.be/-lI0gKz5Qs](https://youtu.be/-lI0gKz5Qs).
CHAPTER FOUR

TEMPERMENTAL BODIES in LIGETI’S TRIO (1982)

In 1978 György Ligeti was asked by violinist Eckhart Besch to write a work for the instrumentation of Brahms’s Op. 40, and the modernist composer admitted that romantic notions of the horn served as a lure to accept the project: “As soon as he pronounced the word horn, somewhere inside my head I heard the sound of the horn as if coming from a distant forest in a fairy tale, just as in a poem by Eichendorff.”¹ The resulting work, a Trio for piano, violin, and horn premiered in 1982, similarly alludes to romanticisms—consonant, if non-functional triadic sonorities, lyrical melodic utterance, and traditional movement structures—that, for some, called Ligeti’s modernist credentials into question.² Though he disavowed direct influence, and rejected a request from the chairman of the commissioning ZEIT-Foundation to incorporate Brahms’s themes directly, some parallels to the Brahmsian original are clear: the works are roughly equal in length, they are both four movements, and both use the same instrumentation. As a concession for the commission, the work is designated as an hommage à Brahms.

As we observed in the case of Brahms’s horn trio, the violin, horn, and piano are situated in three different organological taxa, presenting different mechanical abilities. The focus in that chapter was on the various technologies of hand and valve that afforded the hornist equal footing with their chamber musicking partners, with respect to access to chromatic pitch space and

² Particularly well examined in Michael D. Searby, Ligeti’s Stylistic Crisis: Transformation in His Musical Style, 1974-1985 (Lanham: Scarecrow Press, 2009). Richard Steinitz notes that Ligeti had been in the regular practice of playing (common-practice) chamber music with students at the Hochschule for several years, and reviews connections to a number of other influencing works—from Schumann to Monteverdi—listed in Ligeti’s “plan” for the work, which notably did not include Brahms. Richard Steinitz, “À qui un hommage? The Genesis of the Piano Concerto and Horn Trio,” in György Ligeti: Of Foreign Lands and Strange Sounds, ed. Louise Duchesneau and Wolfgang Marx (Woodbridge: Boydell Press, 2011), 168–212.
timbral homogeneity. In this chapter, we will turn to Ligeti’s Trio and focus upon the instruments’ distinct temperamental constitutions, or the particular ways the topographies of the instruments apportion analog pitch space at the intersection of instrumental mechanics and musico-social imperatives. The digital grid of the piano divides the continuum of frequencies contained in an octave into twelve fixed units of pitch, equally spaced for maximum efficiency; the violin is almost infinitely flexible beyond its four strings’ fundamentals and tempered only by the sensibility of the violinist. As we now well know, the horn works at the intersection of the arithmetic harmonic series afforded by its tube length, which can be set to any fundamental provided the by the valves, and fleshy maneuvers of the hand and lip that can push at the boundaries of the pitch envelope.

Intonation did not present a particularly salient concern in Brahms’s romantic Trio; however, Ligeti’s modernist Trio dramatically emphasizes the instruments’ intonational heterogeneity—functions of the way pitch is afforded and produced by the individual instruments and their players—which present both challenges and opportunities for the composer and performer. Rather than attempting to neutralize distinction or homogenize the ensemble, Ligeti reveled in such technological idiosyncrasies: in his Trio, he specifically calls for the hornist to bypass typical practices of temperamental correction and sociable intonational imperatives, allowing the untempered natural harmonics particular to the instrument—such as the particularly marked eleventh partial, heard in Messiaen’s comme la trompe de chasse, and the seventh—to sound in stark contradistinction to the piano’s equal temperament.

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3 While typically defined in relation to the keyboard’s interface (discussed below), we might understand musical temperament as any system to organize the full continuum of analog sound into discrete units, called pitches, afforded by a given instrument’s constitution.

4 The first instance of natural harmonics composed for the valved instrument is in the first and last movements of Benjamin Britten’s Serenade for tenor, horn, and strings (1943), where it is used as a pastoral or bucolic referent; Ligeti also used conspicuous natural harmonics in the Concert Românesc (1951) to evoke a bucolic setting, which we will examine in a moment. The less imagistic approach evinced in the Trio is also used in the Piano Concerto, a
Temperament has a long history in the study of keyboard instruments to refer to intervallic relations and compromises made by the grid’s one-to-one pitch mapping, but the concept can be usefully broadened to refer to the constitution of any instrument’s place-to-pitch mapping, or the way the instrumental interface structures discrete pitch spaces within the analog continuum of sound. In fact, the term temperament was first applied to human bodily constitution and physical health—a matter of individualized admixtures of bodily fluids and humors—and even now retains its meaning as “a constitution or habit of mind, esp[ecially] as depending upon or connected with physical constitution; natural disposition.” (Recall, too, that organology is the study of musical instruments, but also, in historic usage, the study of the organs of the body.) So to consider a piano’s temperament, a violin’s temperament, and a horn’s temperament is to consider both the way these instruments organize pitch according to their technological affordances, but also to evoke a sense of constitution, of comportment, of embodiment.

While intonation—that is, the alignment and adjustment of sounding pitch spaces to create culturally-defined concordance—is a constant site of negotiation in drastic rehearsal and performance, intonational practices are seldom considered in gnostic musicological and compositional discourses. These gnostic auditors, like the modern pianist (but not the piano project which overlapped with the Trio. In the Violin Concerto (1990–93), he wrote for one section violin and one section viola to tune their instruments to the harmonics of various strings of the double bass; the other section strings are to tune as normal. Additionally, he wrote for natural harmonics in the brass section and for collections of other “mistuned” instruments, such as ocarinas. His late Hamburg Concerto for solo horn and orchestra (1998–9), with the orchestra’s horn section performing on natural horns with different fundamentals, is well discussed in Anthony Cheung, “Ligeti’s Magic Horn: Parallel Universes of Tuning and Tradition in the ‘Hamburg Concerto’” (Ph.D. diss., Columbia University, 2010).

For example, not all lip-vibrated aerophones sound the harmonic series proper. In the case of more rough-hewn or merely decorative examples, the instruments will sound a series of decreasing intervals as they ascend (what de Souza would identify as the natural invariant of any 423 instrument), but these might not conform to the idealized harmonic series. Rather, it is typically only refined examples that embody, more or less, the idealized corps sonore, a culturally-inscribed invariant of Western “brasswind” instrumental construction; these latter examples, then, could be considered to be “well-tempered.”

tuner), can largely take intonation for granted, and tend to assume a more-or-less equal tempered habitus if mentioned at all. Thus, when the hornist sounds the prescribed untempered harmonics in Ligeti’s Trio, analysts and listeners code those notes and passages as “out of tune,” using the same terminology as if they were errors in execution. In common practice, Werktreue-driven musical performance, pitches heard as “out of tune” are an opaque smear on the transparency of the performance, bringing the performer back to our attention; Ligeti, however, had an express interest in the clash of tuning systems or temperaments, and specifically wrote for these effects. He compared the aural experience of such (aestheticized) intonational conflict to that of observing “a body in a state of gradual decomposition.” When diagnosed as “out of tune,” the uncorrected partials called for in the Trio can be heard as symptoms of a failing organ in the musical body, a defect in the bodily constitution or mind of the complete musical persona, or simply as a failing hornist.

The analogy to bodily impairment invites intervention from cultural and critical disability studies, which considers the experiences and sociopolitical meanings of bodies and the minds marked as “defective” by systems of power. The prevailing medical model locates disability in an abnormal constitution of the individual body or mind, coding “impairments” as factual, significant, and objective, but always only personal, medical tragedies. Difference is diagnosed

For example, many music theory textbooks in conservatory curricula will not mention the existence of alternative temperaments or tunings, or may only do so at the very beginning or end of their text. The effect of assuming singular temperament can be quite disorienting: in my early conservatory years, I was being rigorously trained in just intonation standards for orchestral performing (to produce beatless concordances) while at the same time I was being trained to identify triadic chords from the equal-tempered piano in my aural skills classes; the piano began to sound increasingly out of tune to my ears as they gained hornistically valuable sensitivity to acoustic beating.

In Conversation, 54.

Fiona Kumari Campbell, Contours of Ableism: The Production of Disability and Ableness (New York: Palgrave Macmillan, 2009), 167: “By adopting the ‘thought of the outside’ (as expressed by Foucault…) and repositioning our gaze it may be possible to open up ‘space’ for oppositional technologies of self that posit disability as a positive erotic, grounds for subjugated celebratory experiences of disability.”

Campbell, Contours of Ableism, 97.
as disability and in need of cure. A critical, cultural model of disability reveals, however, that such material differences become “disabilities” only when they stand at odds with the workings of the social order, which tacitly enforces “ableist” ideologies and the hegemony of “compulsory able-bodiedness.” Disability studies, which in the last decade has also found a critical place in music studies, seeks to recover the voices and bodies of those not typically seen and heard in society—those silenced, effaced, and quarantined by modern pathologies of difference—by valuing a plurality of morphologies, abilities, and behaviors. A second wave in the mode of critical ableism studies turns the focus on the production and problematization of the normal, the able body and mind, the “Abled.”

Disability performances, Mitchell and Snyder write, can adhere to “any body capable of being narrated as ‘outside the norm.’” Inasmuch as the body can be understood as an organic machine, or as much as the instrumentalist can be glossed under the sign of their musical machine (as in Cone’s musician-cum-instrument) or as a cyborg, this finds resonance with

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11 Rosemarie Garland-Thomson, “Integrating Disability, Transforming Feminist Theory,” NWSA Journal 14, no. 3 (2002): 5: “Disability is a fabricated narrative of the body, a system that produces subjects by differentiating and marking bodies… Disability is a broad term within which cluster ideological categories as sick, deformed, ugly, old, maimed, afflicted, abnormal, or debilitated—all of which disadvantage people by devaluing bodies that do not conform to certain cultural standards.” Thus, Fiona Campbell states, cultural approaches to disability “figure disability as a representational system” (Contours of Ableism, 99).


13 Such as in Fiona Campbell, Contours of Ableism, and Robert McRuer’s body of work, including “Compulsory Able-Bodiedness and Queer/Disabled Existence,” in The Disability Studies Reader, ed. Lennard J. Davis, 2nd ed. (New York: Routledge, 2006), 301–8, and Crip Theory: Cultural Signs of Queerness and Disability (New York: New York University Press, 2006). As McRuer’s titles indicate, disabilist and crip theory has important precedents and analogs in queer theory, and the concepts of fluidity as working against constructed dualisms is similar. I choose the lens of disabilist theory due to the complex of relationships between the lived body and mediating technologies that are foregrounded in that space.

composer Ligeti, who admitted, “I have always been fascinated by machines that do not work properly; in general, by the external world of technology and automation which engenders, and puts people at the mercy of, bureaucracies.”¹⁵

Temperament, then, is a function of material technological affordances and socio-cultural priorities that define an instrument’s (dis)abilities; I demonstrate that some instruments come to occupy a transparent, normative temperamental position while others are marked by their different intonational abilities. I then consider the notions of copresence and intercorporeality, where bodies encounter one another in instrumental execution and illuminate negotiations of the lived, experienced body, the musicking (and music-made) body-mind.¹⁶ Reading Ligeti’s Trio closely for both explicit and implicit intonational practices—intercorporeal contests and management in its performance—I reveal in the work an aesthetics of disability that *crips* the tacitly normalized distribution of pitch space and regulative assumptions of analytical discourse, putting into question how one is “in tune” with the musico-social order.¹⁷ In the conclusion, I

¹⁵ *In Conversation*, 16.
¹⁶ Some disability studies writers, including Eli Clare, and writers in other, non-Western traditions, adopt the term *body-mind* or variants thereof (including *mindbody*, *bodymind*, *body/mind, body-and-mind*) to recognize that body and mind are of a singular entity, in resonance with Merleau-Ponty’s phenomenology (as well as feminist phenomenologies, and contra Cartesian dualism) that locates the experiencing subject (mind) within a situated body to which it is inextricably bound.
¹⁷ Similar to *queer* and *queering*, the term *crip* (short for *cripple*) is both a reclaimed positive identity marker among people with disabilities (as a noun and adjective) and a descriptor (noun, adjective, or verb) for artistic or analytical performances that “reveal dominant assumptions and exclusionary effects” of compulsory-ablebodiedness. See Victoria Ann Lewis, “Crip,” in *Keywords for Disability Studies*, ed. Rachel Adams, Benjamin Reiss, and David Serlin, (New York: New York University Press, 2015), 46–8.

Lydia Goehr writes that challenging self-evidence (such as, here, of the rightness of equal temperament, or in disability studies, of the normative, abled body) “promotes a realist position, although it is the sort of realism that results from the sort of idealism that holds that truth, rather than being found, is described according to the concepts available to us subjectively, which, mediated by our complex and dynamic interactions with the world, then become also the objects of our investigation.

One way to move concepts between these subjective and objective poles is via phenomenological acts or perspectival or imaginative variation, only that here the variation does not reach an end” (*Imaginary Museum of Musical Works: An Essay in the Philosophy of Music*, Revised Edition (New York: Oxford University Press, 2007), xlv).
move from representational disability aesthetics to a performed ethics of care, where attunement to the *work* of music performance can rehearse human affordances of negotiation and accommodation.

**A Shift in Disposition: Stylistic Crisis**

Michael D. Searby has identified the Trio as closing a period of stylistic crisis for Ligeti, evidenced by a stretch of near-silence following his completion of the opera *Le Grand Macabre* in 1977, and as setting crucial groundwork for his late style. Searby also mentions in passing that Ligeti took ill for some time during this period. As such, we might consider music theorist and disability studies scholar Joseph N. Straus’s notion of late style as “disability style,” where certain characteristics of late style reflect the presence of an ill, disabled, or otherwise nonnormative functioning body in the composer’s immediate experience. The onset of Ligeti’s illness, then, provides one way in which we might understand the Trio from the perspective of disability studies: the musical retrospection (nostalgia, anachronism, and simplicity) evinced in the Trio is a function of Ligeti’s awareness that his body was, as in his description of his intonational effects, “in a state of gradual decomposition.”

But Ligeti’s few published experiments during this period and contemporary interviews reveal a postmodern sensibility, what he described as a “crisis of the whole generation to which I belong,” rather than a personally nostalgic late style. It is not retrospection provoked by the decline of the composer’s own body, but rather the sense that the systems of twelve-note serialism—and the equal temperament upon which it necessarily relies—were “worn out.”

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19 Cited in Richard Steinitz, “Genesis,” 169; and *In Conversation*, 16. Ligeti had already received the commission for the Piano Concerto some years previously, and during this period of stylistic crisis (which Ligeti also claimed at one point), Ligeti wrote at least 50 sketches for the beginning of the work, which would not be premiered until 1988.
Commentators and analysts of the Trio such as Searby, Richard Steinitz, and Stephen Taylor have pursued typically formalist approaches, reading for the restoration of triadic harmony, traditional formal structures, and other romantic stylistic qualities in the work. But motivic “distortion” and the horn’s idiosyncratic temperament practices, resulting in pitches heard as “mistuned” and “out of tune,” have proved impossible to ignore when encountering the work, even when not at the center of analytical focus.

Ligeti completed only two works in the five-year stretch between *Le Grand Macabre* and the Trio, *Passacaglia ungherese* and *Hungarian Rock* (1978), both for harpsichord in mean-tone temperament. Perhaps, when he received the commission for the Trio that same year, the horn brought to mind was the same one that appeared in his 1951 orchestral work *Concert Românesc*, where it evokes bucolic or pastoral associations that Monelle cites as sourced in the alphorn’s *ranz des vaches* (ex. 4.1).

Example 4.1. Ligeti, *Concert Românesc*, III. (Adagio ma non troppo), mm. 2–7, horns 1 and 3 in F

Steinitz argues that the Trio was “an opportunity to sidestep the intractable problems” of the Concerto (“Genesis,” 171).


21 Ibid.

Note that, per Ligeti’s instructions, the hornists are to not correct those partials that deviate from equal temperament; the result is an *echos* that he had heard as a child:

The alpenhorn [sic] (called a *bucium* in Romanian) sounded completely different from “normal” music. Today I know that this stems from the fact that the alpenhorn produces only the notes of its natural harmonic series and that the fifth and seventh harmonies [sic] (*i.e.*, the major third and minor seventh) seem “out of tune” because they sound lower than on the piano, for example. But it is this sense of “wrongness” that is in fact what is “right” about the instrument, as it represents the specific “charm” of the horn timbre.

These present experiments with mean-tone harpsichords and the memories of “wrong” feeling horns were, perhaps, exactly what was needed to destabilize received logics and revitalize his music. In postmodern logic, perhaps, the way forward was to look back, but not to mere romantic nostalgia. Rather, Ligeti redeveloped his approaches in encounters with non-equal tempered organizations already present as latent difference in instrumental constitution and phoné.

**Temperamental Bodies in Common Practice**

The strings of the violin recall Pythagoras’s monochord that, with the use of a bridge to perfectly divide the instrument’s string, revealed the principles of celestial harmony. When the four strings of the violin are stopped by the fingers of the human player, however, division of the string becomes a more mundane matter. Recall James Gibson’s notion of *affordances*: these are potentials for use of a tool that arise when coupled with an agent who is always already situated in a particular environment. These affordances, then, are based upon both “natural” and

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23 The specific instrument that Ligeti refers to as *alpenhorn* is most likely not the long, subtly bent Swiss instrument of the Alps, but the shorter, straight Carpathian mountain version.
“cultural” invariants: according to the natural invariant properties of vibrating strings, the violin’s pitches become higher as the string is shortened; the fretless fingerboard and (generally) the tuning of the four strings’ fundamentals are cultural invariants in the way the instrument is constructed.\textsuperscript{26} Ultimately, then, the violin affords a wide and fluid range of pitch above its bottom G.\textsuperscript{27}

The piano offers rather different affordances: the spatialized distribution of pitch into fixed units is a natural invariant of the keyboard’s digitizing grid, which is typically organized—a cultural invariant—as a twelve-unit subdivision of the octave. As Roger Moseley explores in \textit{Keys to Play} (and as we did in chapter two), the interface of the keyboard has provided a rich site for the cultural techniques of music, and the digital affordances of the piano have come to occupy a central place as an improvisational, compositional, and recreative tool.\textsuperscript{28} It is an additional cultural invariant that violins and pianos are played with fingers.\textsuperscript{29} The coordination of finger to sound with the piano, however, is different than with the violin: when a key is depressed, the string is percussively struck by a hammer as a prosthetic extension of the finger. De Souza explains that “affordances and abilities… are essentially codefined”: the violinist (the player and the violin, incorporated) can play a continuum of pitch afforded by the fretless fingerboard, where the pianist can play twelve divisions of the octave afforded by the grid of the keys.\textsuperscript{30} The piano’s one-to-one ratio of mechanism to pitch cannot be adjusted in performance

\textsuperscript{27} Scordatura and subharmonics—the potential for a string to vibrate at twice its length when given a certain bow pressure, speed, and position—are excluded here, since neither technique is called for in the ecology of the Trio.
\textsuperscript{29} de Souza does mention a parody of Chopin’s Étude in G-flat, op. 10, no. 5, in which the celebrated concert pianist Lang Lang plays the melody, written entirely for the raised black keys of the piano, with an orange (\textit{Music at Hand}, 25).
\textsuperscript{30} de Souza, \textit{Music at Hand}, 13.
and therefore requires a systematic approach for the assignment of echos within the topos of the grid—a spatial distribution of sound determined in advance—or, in its normative musical definition: temperament.

Until the early nineteenth century, a number of temperaments were in wide circulation. The perfect ratios and sonorous affordances of earlier temperaments, however, limited the keyboard in other ways: stacking perfect Pythagorean fifths yields imperfect octaves, and meantone temperaments of relatively “purer” intervals were not fully circular, that is, not universally applicable in all keys or contexts. The discrepancy in the octave or lack of full transposition created a “howling” interval named the “wolf” tone, an animalistic label for an imperfection that evades human control and logos. Additionally, individual temperaments took time and skill to reproduce and were prone to human error on the part of piano tuners. To both excise the wolf and gain more expeditious and precise tuning, equal temperament (ET) became the standard and ultimately singular system of organization in the nineteenth century.

As music historian and disability scholar Blake Howe has demonstrated, our modern medical and statistical notions of “normal” and “abnormal” came into use in the same cultural milieu. He describes how Francis Galton’s science of eugenics distributed human variation

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31 There is a second use of the “wolf” concept in string instrument construction, used to describe the effect produced when a bowed pitch corresponds very closely to the pitch at which the body of the instrument naturally vibrates, creating two powerful resonances with slightly different fundamentals (and so related, somewhat, to the Pythagorean “wolf”). The result is a very fast acoustic beating—a “growling”—arising from the instrument itself, and one powerful enough to effectively impede the bow control of the player. The effect can be reduced using a “wolf eliminator.” Animalistic labels used to distance the labeled from humanity and reason are part of the discourses of “freakery” or “enfreakment” examined in Rosemarie Garland-Thomson, ed., Freakery: Cultural Spectacles of the Extraordinary Body (New York: New York University Press, 1996).
under a bell curve, marking the boundaries of acceptable deviation from the norm. In eugenic logic, those non-standard body-minds found at the extreme ends of the chart (including bodies that were simply raced, gendered, or poor) were marked as abnormal, disabled, and unfit for reproduction. Even following the demise of eugenics as a social movement, modern medicine remains dedicated to the cure of body-mind defect and impairment, which is always understood as negative. Disability is marked against present-absence: the unmarked, constructed “able body” which is both everywhere—hegemonic—but, due to its idealism, ultimately nowhere. “Viewing the disabled body [or mind] as simply matter out of place that needs to be dispensed with or at least cleaned up is erroneous,” disability scholar Fiona Campbell writes. “The disabled body has a place, a place in liminality to secure the performative enactment of the normal.”

Disability theorist Rosemarie Garland-Thompson suggests the term “normate” to name this shadowy figure, “the veiled subject position of cultural self, the figure outlined by the array of deviant others whose marked bodies shore up the normate’s boundaries.”

This normate body-mind presents a collection of unmarked affordances, such as bi-pedal motion; the possession of a certain standard of sight, hearing, education, and income; cis-gender identity; a phenotype constructed as white; and the assumption of non-pregnancy. These somatechnical affordances become co-extensive with ability, the “abilities” of the “able body” that become compulsory for all bodies. As cultural disability studies notes, these normate abilities are built into the environment—stairs (instead of elevators), gender-specific restrooms (rather than single cubicles), the presence of a body-mind in the workplace who needs only

35 Campbell, Contours of Ableism, 12.
36 Rosemarie Garland-Thomson, Extraordinary Bodies: Figuring Physical Disability in American Culture and Literature (New York: Columbia University Press, 1997), 8. She continues: “The term normate usefully designates the social figure through which people can represent themselves as definitive human beings.”
minimal health or family leave (as opposed to regular telecommuting and adequate parental
leave). Following the advice of disability studies scholar Tom Shakespeare, let us name the
“normality-which-is-to-be-assumed”: as an idealized white, bourgeois, hearing and walking cis-
man came to embody model health, ET came to occupy the middle and ultimately only position
at the keyboard.37

Back at the keyboard, de Souza considers that, “when I play a conventionally tuned
piano, I might hit the wrong note—but I cannot produce a note between the steps of the
chromatic scale, a note without a name. … The keyboard, as a space for action, brings forth a
pitch world that is culturally and historically specific.”38 Recalling Moseley’s words on the
digital analogy, the interface “partitions and classifies sound, imposing discipline on the
generation of acoustic material as well as the body of the player and the sensibility of the
listener.”39 With the keyboard as a principal site of compositional and analytical organization and
instrumental imaginaries writ large, the musical *echos* generated by the affordances of the equal-
tempered piano—such as simultaneity of sound, consistency of timbre, and fixedness and
distribution of pitch—become normative, expected characteristics of musical embodiment for all
instruments and their executants; they become *regulative*, to some extent, for all instrumental
phoné.40 The violin has the affordances to meet the piano’s temperament, as the fingers of the
player are shaped by years of practice, trained to produce discrete pitches governed by the ability

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38 Music at Hand, 25 (emphasis added).
39 Moseley, *Keys to Play*, 90.
of the violinist’s ear. The pianist, by contrast, is able to take intonation for granted in
performance, since this labor of programming is undertaken in advance by a specialized piano
tuner (or is, conversely, trapped by it).\footnote{De Souza identifies this as distributed cognition \cite{DeSouza2019}, a kind of interdependency that finds resonance, perhaps, in the relationships between blind individuals and their service animals, or in the Braille transcriptionist, or as in the late Stephen Hawking’s computerized speech-assistance system.} Invariance leads to transparency, de Souza notes; with
the equal tempered standard fully in force and the piano now appearing fully autonomous, ET
becomes unremarkable, assuming normate status.\footnote{Ibid., 21. Garland-Thomson describes that “Normate, then, is the constructed identity of those who, by way of the bodily configurations and cultural capital they assume, can step into a position of authority and wield the power it grants them” \cite{Garland2010}.} When musical ears are trained from the piano
at the center of aural skills and music theory classrooms, temperament or its possible variation is
seldom mentioned at all.\footnote{We might then also relate temperament to habitus, a Latin derived word meaning bodily constitution, but also, \textit{pace} Marcel Mauss and Pierre Bourdieu, the deeply engrained habits, skills, and dispositions that are reflective of cultural capital and ideals, an internalized interpretive framework that, like material instruments, frame perception and recede from consciousness as it is acquired. Since it is itself a “structuring structure,” it is thus very difficult to do much but reflect and reproduce the structure that gave rise to it. The notion is useful to bring together the cultural and techno-physiological aspects of what we might consider a \textit{practice} of temperament. See \textit{Pierre Bourdieu, Outline of a Theory of Practice}, trans. Richard Nice \cite{Bourdieu1977}.} Intonation becomes almost inaudible within gnostic musicological
discourse.

The flexibility of pitch available to the violinist can be a source of value, such as the
expressive intonation practices of Casals or the personal “modes” of Joachim and Sarasate as
heard by George Bernard Shaw.\footnote{George Bernard Shaw, \textit{Music in London 1890–94}, vol. II \cite{Shaw1890}, 276-7.} But this temperamental ability—or flexibility—requires a
certain affordance on the part of the listener, what Howe refers to as “sonic tolerance.”\footnote{“Temperamental Differences,” np.} Rather,
musicians of less stature must adhere more closely to the centerline, for as Lennard J. Davis
describes, “the concept of a norm, unlike that of an ideal, implies that the majority of the
population must or should somehow be part of that norm.”\footnote{Davis, “Constructing Normalcy,” 6.} This is more starkly described by
Robert McReur as “compulsory able-bodiedness,” which names the constant demand that all
bodies perform and re-perform normalcy based on the assumption that it must be preferable to
disability.\textsuperscript{47} Plasticity of pitch—slipping between the steps afforded by the keyboard or too far
from its constitution—will often be coded as having bad intonation, a leaky defect that must be
corrected or cured to restore normate status, or else the offending body is expunged in a musical
logic of euthanasia.\textsuperscript{48}

Because they are not afforded by the keyboard’s grid, however, the finer gradation of
melodic intervals presented by the \textit{corps sonore} (fig. 4.1) is largely forgotten to us.\textsuperscript{49} With the
keyboard as the space of musico-logical action, several of these pitches are extraordinary enough
as to not garner names in our semi-tonal system (fig. 4.2, partials 7, 11, 13, 14).\textsuperscript{50}

\begin{footnotesize}
\begin{enumerate}
\item[47] McRuer, “Compulsory Able-bodiedness.”
\item[48] Rosemarie Garland-Thomson, “The Cultural Logic of Euthanasia: 'Sad Fancyings' in Herman Melville’s 'Bartleby',' \textit{American Literature} 76, no. 4 (December 2004): 777–806. In short, the cultural logic of euthanasia is the
notion that a disabled life is not worth continuing: either the disabled body is redeemed through (medical)
intervention, or else the disabled body is disposable (779).
\item[49] In the second section of his piano method, Hummel goes to some effort explain the difference between a major
and a minor semi-tone for understanding theoretical harmony, but first remarks that “the difference between the
\textit{major} or \textit{diatonic} semitone, and the \textit{minor} or \textit{chromatic} semitone is not perceived by the ear, but is rather addressed
by the eye”; Johann Nepomuk Hummel, \textit{Theoretical and Practical Course of Instructions on the Art of Playing the
Piano Forte} (London: Boosey and Hawkes, 1827), 17. On the other hand, when I was learning just intonation as a
hornist, I was taught and tested upon how much each interval deviated from equal temperament, so that I might
locate the pitch by eye against my equal-tempered tuner in order to learn how it sounded and felt in its idealized
form.
\end{enumerate}
\end{footnotesize}
By combining multiple lengths of horns together, the modern valved hornist can choose to execute a given pitch as a privileged partial in alignment with ET standards rather than modifying, through bodily gymnastics of hand or lips, a partial that does not conform. For example, the B-flat—embodied in the seventh partial on a valveless instrument, but approximately 31 cents “too flat”—can instead be sounded as the eighth partial (a tonic) on the
first valve (cf ex. 2.6, appendix B), when the fundamentals of the valve tube lengths are set more or less in ET. Thus the valve technology designed to give hornists fluent, homogenous chromaticism throughout their compass also affords the hornist the ability—and often the compulsion—to meet ET standards, that is, to appear or pass as an otherwise normate-tempered instrument and reifying assumed normality—it can perform normalcy.51

This technological development in brass instrument sounding can be likened to the development and marketing of the cochlear implant for the hard-of-hearing and deaf. The experimental hearing device becomes, in Campbell’s figuring, “transmogrified… into a bona fide curative solution to the ‘problem’ of profound deafness,” like other treatments and tools which cure deficits of the body or mind. Deafness, however, is only ontologized as disability in an oral, audiologically obsessed environment, giving rise, within the d/Deaf community, to a “contestable ethos of sound.”52 Such “technologies of ‘treatability,’” which Campbell calls dis/technologies, “engage in a circular logic[,] with the agency of the artefact folding back onto the potential recipient who is then figured as diseased or deficient, that is the possibility of ‘curing’ deafness means that Deafness needs and therefore must be cured.”53 Cochlear implants do not restore acoustic hearing; rather, the prosthesis bypasses the tactile auditory apparatus and

51 That the hand horn can afford this, as well, is why intonation and temperament were not of salient critical or analytical concern in the Brahms Trio. As such, hand technique (or valves) can be recast as a technology within a network of interest that, “in their connectivity enact, perform, and configure ontologies of deafness [disability] and hearingness [normate ability]” (Campbell, Contours of Ableism, 88). Importantly, “although the conditions of ableism may allow dis/technology to mediate an ontology, it is questionable that the dis/technologised person actually morphs the abled ontology. Indeed what is produced is something different, a not-quite-abled” (Ibid, 59).
52 Campbell, Contours of Ableism, 80. “What is meant by ‘sound’ and what are the conditions of its interpretation?,” she writes. “Is what is being referred to a matter of degree and quality of audiological inputs, that is a strictly medical definition or does ‘sound’ denote and elicit a more cultural nuance, a qualitative aspect of subjectivity that interfaces and mediates a world obsessed with oralist interactivity?” (Ibid., 87). See also Jessica A. Holmes, “Expert Listening beyond the Limits of Hearing: Music and Deafness,” Journal of the American Musicological Society 70, no. 1 (Spring 2017): 171–220.
53 Campbell, Contours of Ableism, 80.
replaces inputs to the auditory nerve with electrically-generated ones. The user remains medically deaf, but has the affordances to perceive sound, a crucial ability for functioning in an oralist environment.  

Similarly, the valves as prosthesis or dis/technology do not change the temperamental constitution of the horn, but rather make it possible for the hornist to meet ET standards of musical embodiment by cobbling together various partials from different harmonic series (again, refer to fig. 2.6; I also include as Appendix B a similar chart for the four-valved “double” horn, the instrument that became standard in the twentieth century and is required for performance of Ligeti’s Trio. In short, thanks to an additional ascending valve at the thumb that shortens the F length instrument to an instrument in B-flat, and using the three finger valves to lower that horn in the manner observed in the second chapter, the modern double hornist how has twelve distinct horns, with twelve distinct fundamentals, contained within a single instrument).  

When the hornist can be (re-)made, through the instrumentalization of the valve prosthesis, to meet or give the semblance of ET normalcy, why would deviancy be permitted, let alone desired? As a dis/technology, the valves normalize, restrain, and realign the common-practice hornist’s comportment. Hornists work to hide the mechanism of the instrument’s

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Deafness “shuts its unfortunate subject out of the Society of his fellows,” deaf author John Burnet wrote in 1835. “Yet this is not because the deaf are deprived of a single sense; but because the language of the hearing world is a language of sounds. Their misfortune is not that they are deaf and dumb, but that others hear and speak. Were the established mode of communication among men, by a language addressed, not to the ear, but to the eye, the present inferiority of the deaf would entirely vanish”; John Robertson Burnet, *Tales of the Deaf and Dumb: With Miscellaneous Poems* (Newark, NJ: B. Olds, 1835), 47. 


56 Campbell, *Contours of Ableism*, 87. 

57 As in Campbell, *Contours of Ableism*, 47.
prosthesis, smoothing over bumps in the sound that are made when opening and closing the valve tubes while practicing equal-tempered chromatic scales. Even when playing alone, valved hornists avoid certain partials (the marked 7, 11, 13 and 14 on every length of horn) almost entirely, having internalized the stigma of being “out of tune” with the norm. The player is trained in the ET environment and trains her ear and embouchure (her hornistic body-mind) to the strictures of a musical system to which her instrument’s corpus does not necessarily conform, controlling and ultimately silencing the distempered way in which the horn proposes itself to the world.\(^5^8\) Campbell argues “that ‘enhancing’ and ‘perfecting’ technologies”—the cochlear implant, a prosthesis, psychological medication, or by extension, valves—“are really a form of assimilation by way of morphing ableism. A technology dynamic of morphing creates an illusion (appearance) of the ‘disabled’ body transmogrifying into the ‘normal’ resulting in a corporeal re-composition and re-formation of subjectivity.”\(^5^9\)

Instrumental affordances, then, lead to idiomatic distributions of pitch. In his critique of the organological corpus, Szendy considers the description of tablatures as a kind of “blind learning,” or as idiotisms, the direct mapping of the player’s bodily affordances (idioms) to the

\(^{58}\) Disability scholar and activist Eli Clare writes, “Defectiveness,” always defined against an invisible normal, “justifies cure and makes it essential…. Defectiveness wields incredible power because ableism builds and maintains the notion that defective body-minds are undesirable, worthless, disposable, or in need of cure. In a world without ableism, defective, meaning the ‘imperfection of a bodily system,’ would probably not even exist. But if it did, it would only be a neutral descriptor. However, in today’s world where ableism fundamentally shapes white Western cultural definitions of normal and abnormal, worthy and unworthy, whole and broken body-minds, any person or community named defective can be targeted without question or hesitation for eradication, imprisonment, institutionalization…. Entire body-minds, communities, cultures are squeezed into defective. And then that single blunt concept turns, becoming defect. Bullies hurl it as an insult. Strangers ask it out of curiosity. Doctors note it in medical files. Judges and juries hear it in testimony. Scientists study it as truth. Politicians write it into policy. Defect and defective explode with hate, power, and control” (Brilliant Imperfection, 23). He later writes that cure as elimination can increase comfort and save lives. “At the same time, it also commits damage, routinely turning body-minds into medical objects and creating lies about normal and natural” (Ibid, 26).

The gnostic musicus, in command of the universal laws and sciences of music, framed instrumental tablature as “the idiot’s idiolect”: musical knowledge grounded in mere pragmatic execution would never be able to ascend to the logos accessed by the voice through song. The shared root of all these nouns and adjectives is idios, a Greek word meaning particular or uniquely one’s own, which is also the root of idiot. Idiocy is a fuzzy and slippery historical category and diagnosis of disability that described an array of intellectual and learning impairments, but has also been wielded against many body-minds that, lacking “reason,” are not to be granted a voice. In ancient Greece, as a “private man,” the idiot could not command authority in the public space; in the eugenic age, the “feeble-minded” were to be quarantined or sterilized for their potential degeneracy of the social body. Regardless of the historical diagnostic label, those who think, process information, or communicate differently have often been denied the possession of reason in toto, which “both represents and embodies truth. It [reason] partakes of universality in two ways: it operates identically in each subject and it can grasp laws that are objectively true; that is, are equally knowable and binding on every person…. The bearer of reason, the disembodied and universalized he-man can arrive at a ‘view from nowhere’.” The normative body-mind can become the autonomous gnostic citizen, where the “idiot” is

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60 Szendy, Phantom Limbs, 33–7.
61 Ibid.
62 As Eli Clare (Brilliant Imperfection, 157) reminds us, the various labels for those who think, process information, or communicate differently can and have been used against a multitude of heterogenous bodies, including those who are deaf, chronically ill, or otherwise disabled. By a similar token, denial of reason has been legislated in various forms against racialized, gendered, queer, poor, and foreign bodies, marking the boundaries not only of the normate but, as in the case of the racialized body under chattel slavery, also of personhood itself.

drastically bound to their mere material condition, at the cusp of personhood, granted only what Agamben refers to as a “bare life.”

We can use the notion of *idiolect* and its antithesis, “shared” or “universal” language, to begin to understand the relationships between temperamental sounds afforded by the heterogenous instrumental body-minds at work in the Trio. While each instrument examined above possesses an idiosyncratic temperamental constitution, musico-social practices of intonation call for adjustment onto shared ground. Both the violinist and hornist are able to speak—qua *dialect*—the imperatives of just intonation, flexible enough to produce “pure” concords that exclude or limit the participation of the pianist. A sociable approach to intonation in the space of the Trio, however, asks the more flexible instruments to accommodate the more rigid or foundational. Thus with the piano present, the violinist and hornist should, for the most part, adjust their pitch to match the equal tempered sounds of the piano, giving rise to a shared language between the three; this shared language dictated from the piano then becomes the ground from which all musical knowledge speaks and the temperament of the composer’s voice. Though the other performers remain aware of the distinctions, the instrumental abilities and imperatives of the piano become transparent, *Vorhandenheit*, taken for granted by composer and

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Clare admits, “I’ve repeatedly used intelligence as a marker of my worth and personhood…. [but] Let me remind all of us—disabled and nondisabled—that every time we defend our intelligence, we come close to disowning intellectually disabled people. We imply that it might be okay to exclude, devalue, and institutionalize people who actually live with body-mind conditions that impact the ways they think, understand, and process information. The only way out of this trap is to move toward, not away from, intellectually disabled people, to practice active solidarity” (*Brilliant Imperfection*, 157–158).

65 The language of just intonation is also problematic. The loaded terms of “pure,” “just,” and “true” refer to intervals tuned so as not to create acoustic (interference) beats. Of course, the term “perfect” to describe those concords of lowest whole-number ratios—unison, octave, fifth and fourth—is reflected in earlier discourses surrounding bodily ideals. Howe describes, “Before the 1800s, bodily perfection was an elusive ideal, only manifested by the body of God or the King. In their infinite variation, all other bodies were considered imperfect” (“Temperamental Differences,” n.p.). As to my analysis of the Ligeti Trio below, there simply are not terms available in common enough parlance that I can locate to use.
analyst alike. Conversely, in the mixed space of the Trio, when the hornist plays fluently on successive untempered harmonics afforded by the instrument it speaks an idiolect, a private language all its own.

It might be a bit more accurate, however, to transfer the emphasis of this instrumental phoné from the logos of language to the echos of paralanguage, from what they say to how they say it. As Joshua St. Pierre describes, fluency is “a technology of optimization and closure” that describes “the frictionless transmission of semiotics” and biopolitical operation of hegemonic normalcy toward univocal utterance.66 The negative counterpoint to the “effortless flow of speech” is disfluency, the stutters, lisps, dic tions, accents, or other excesses that interrupt aural communication, and thus disrupts the smooth operations of thought and of power.67 Disfluency is, for James Berger, explored in the figure of the dys-/disarticulate, the figure “blocked from language, standing at the convergence of all of language’s impasses: those of injury, trauma, neurological variation, sociopolitical silencing, and the working of language itself as language plots its own aporias.”68 With fluency as hegemonic, the disarticulate incapable of “sounding good” is thrust away from the social order, disarticulated, paradoxically refused voice by virtue of her phoné.69

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68 Both Brandon LaBelle (Lexicon of the Mouth, 136–7) and Nina Sun Eidsheim (Sensing Sound, 95–101) examine Richard Serra’s Boomerang and other devices and works which use reiterative playback to disrupt the normalized flow of speech. In Serra’s work, as the speaker vocalizes, her audible result is fed back to her with delay; her task is to describe the experience. Her speech becomes increasingly hesitant, slowed, and jammed, as the feedback loop also effects the speaker’s formation of thought, a “productive undoing of the self…. This speech undoing itself, at odds with Being—introduces a vulnerable body. That is, a human body, and one open to the world”; (LaBelle, Lexicon of the Mouth, 137).
69 The notion of “sounding good” in academic performance (especially in music studies) is examined by William Cheng, Just Vibrations: The Purpose of Sounding Good (Ann Arbor: University of Michigan Press, 2016).
Berger introduces the notion of *catechresis* to describe the dysfluent commotion, the excess around language that (ultimately productively) distances the voice from the closed loops of signifying, representational language. (It is not so different from Barthes’s “grain,” but much more present-to-hand.)

Catachresis refers to the wish enacted in language—in poetic language especially, but somehow in all language—to reach toward some place, some piece of consciousness or non-consciousness, outside of language. It is felt sometimes as nostalgia, sometimes as vertigo, or as ecstasy, or terror, or peace. This linguistic place is not enough, but how does one leave it? And how to leave a note saying where you’ve gone?  

Like all disability—and perhaps even more than most—dysfluency must be *performed* to be recognized as such; this is the case with musical intonation, too. To hear it, we must turn to performance, which provides less a note saying where we’ve gone than providing a tracing or a project by means by which one can get there.

As Straus defines in the simplest terms: “disability is any *culturally stigmatized bodily difference*.” I would adjust Straus’s emphasis—disability is *any* culturally stigmatized body-mind difference—remembering that “disability is a broad term within which cluster ideological categories as varied as sick, deformed, crazy, ugly, old, maimed, afflicted, mad, abnormal, or debilitated—all of which disadvantage people by devaluing bodies that do not conform to cultural standards” or cannot perform appropriate fluency of body or speech. In typical musical practice, those pitches that are afforded by and idiomatic to an instrument but in deviation from the sense categories of hegemonic equal-tempered division are evaluated as a kind of

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“wrongness,” even nonsense; the ability to sound different(ly)—what is “right” about the horn—becomes a temperamental liability, a constitutional disability.73

Co-presence: Disability Aesthetics, Intercorporeality, and Claiming Disability

In much musical analysis, we tend to assume (and even insist upon) a cohesiveness of the body at the composer’s disposal—an orchestral totality, the homogeneity of the string quartet or brass band, or the solo piano; returning to Ligeti’s metaphor, the instruments become organs in a single body, or in Cone’s, facets of the complete persona’s internalized voice. Even when multiple agents are foregrounded rather than subsumed into a complete musical persona, these agents at work in sociable music spaces—as in Klorman’s analyses, or even my reading of the Brahms Trio—are already granted or assumed to have an equality of access, a kind of musical normalcy or fluency.74 “Ablenormativity”—as a regulative ideology and related practices, operating in any sphere of interaction—“results in compulsive passing, wherein there is a failure

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73 One of the first uses of the horn’s natural harmonics evoking the bucolic is in the opening and closing solo movements of Britten’s Serenade for tenor, horn, and strings, written for twentieth century horn virtuoso Dennis Brain. The passage includes, upon Brain’s suggestion, conspicuous use of untempered p7 and p13—though according to the recording analysis completed by Jonathan Penny, hornists often execute the latter as p14, with Britten’s blessing: Jonathan Penny, “The Brain of Britten: Notational Aspects of the Serenade” (B.A. thesis, Durham University, 2012).

Perhaps unsurprisingly, early reviewers of the Serenade did not know what to make of the natural harmonics, or rather, thought they knew: “The only disappointments here lie in the opening and closing horn solos; a curiously faulty intonation is apparent here and there which jars the magic of both the Prologue and Epilogue. Fortunately this disappears in the first song and from then on Dennis Brain’s customary musicianship and brilliance are very much in evidence” (Eric Thompson, Review of the 1953 recording of the Serenade, Tempo, Autumn 1954: 39–40, cited in Penny, “Brain of Britten,” 8). Britten retorted in the following issue that Brain was playing what was written, and “Anyone… who plays it ‘in tune’ is going directly against my wishes! If critics do not like this effect then they should blame me and not Mr Brain” (letter to Tempo dated 13 Dec 1954, Tempo, Winter 1954: 39, cited in Ibid., 9). A supporter of Brain similarly rebutted: “I have, like most of Mr Brain’s admirers enough confidence in his outstanding skill, to think that the fault lay not in his intonation but in the ear of your critic…?” (Peggy Shimmin, letter to Tempo dated 12 Nov 1954, Tempo, Winter 1954: 40, cited in Ibid.).

For his part, Brain seems to have regretted the suggestion. His biographer Stephen Pettitt reports, “Dennis confided to a friend after a few performances that he wished he had never suggested that the two solos should be played on natural harmonics” since “it was a nuisance to have to explain, in programme notes or personally afterwards, why it sounded out of tune”; Dennis Brain: A Biography (London: Robert Hale, 1976), 71.

to ask about difference, to imagine human be-ingness differently.”75 But when instruments refuse to (or cannot) behave as they “should,” it leads to a decomposition of the social order, the ablist logic of which can be read in the reactions of analysts of the Trio, those who code the horn as “mistuned” or “out-of-tune.”76

Art historian and disability scholar Tobin Siebers frames aesthetics as bodily encounters when he writes that “aesthetics tracks the sensations that some bodies feel in the presence of other bodies.” He concludes that, “the human body,” then, “is both the subject and object of aesthetic production: the body creates other bodies prized for their ability to change the emotions of their maker and endowed with a semblance of vitality ascribed only to human beings.”77 In other words, aesthetics is first and foremost the affect and effects of bodies—both human and non-human, lived bodies and images of bodies—encountering one another. Crucially here, Campbell notes that “what is described as a ‘disabled body’ is an effect generated by performance of bodies and bodies”—*corps à corps*—“in a heterogeneous network of association.”78 Siebers goes on to propose a “disability aesthetics” of modern visual art, arguing that the disfigured or recomposed human forms represented in modernist styles were central to its aesthetic, a source of newness that destabilized received notions of the beautiful and ultimately proposed new forms of beauty.79 Straus has adopted this concept for his work on musical modernism, similarly demonstrating that disability “enables” musical modernism and that “modernist music claims disability” in affirmation of difference as a creative resource.80

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75 Campbell, *Contours of Ableism*, 4.
76 Interestingly, Messiaen’s *comme la trompe de chasse* passages do not seem to garner much attention in reviews or discussion of the “Appel.”
78 Campbell, *Contours of Ableism*, 56.
79 Siebers, *Disability Aesthetics*, 40.
Mobilized as a productive disturbance or commotion in the aesthetic realm, “disability [becomes] a distinct version of the beautiful.”\textsuperscript{81} Or, in Ligeti’s words, the “wrongness” is, in fact, what’s “right.”

Disability scholar and activist Eli Clare acknowledges that diagnosis can help make meaning of distress—felt “wrongness”—when we encounter the difference of the Other or even within ourselves. “Diagnosis names the conditions in our body-minds, charts the connections between them. It holds knowledge. It \textit{organizes visceral realities}.”\textsuperscript{82} Diagnosis, then, is a way—and the principal mode under the medical-industrial complex—of exerting epistemological control over unruly body-minds in our presence. Read together with Siebers, we can understand diagnosis working in tandem with affective and aesthetic practice as a way of naming and containing the drastic commotion of lived body-to-body contacts, which are always already both aesthetic and, because already in and of the world, political.\textsuperscript{83}

Body-minds, both “normal” and “abnormal,” are often bent to fit labels—names and conditions that change, slip, and shift across time, place, context, and individual experience—not because they necessarily hold “truth,” but because they hold the promise of cure, containment, prevention.\textsuperscript{84} Diagnosis can come to subsume the totality of being into a single categorization, devaluing and shaming difference, obscuring other aspects of being, and the promise it offers is

\begin{itemize}
\item \textsuperscript{81} Ibid., 536. “Commotion” is from Carrie Sandahl and Philip Auslander, eds., \textit{Bodies in Commotion: Disability and Performance} (Ann Arbor: University of Michigan Press, 2005).
\item \textsuperscript{82} Clare, \textit{Brilliant Imperfection}, 41; emphasis mine.
\item \textsuperscript{83} For more on the affective, aesthetic practices of politics and the political practices of aesthetics and affect, see Jacques Rancière, \textit{The Politics of Aesthetics}, trans. Gabriel Rockhill (New York: Bloomsbury, 2004). Rancière’s notion of \textit{dissensus} is roughly equivalent to disabilist “commotion.”
\item \textsuperscript{84} This is why white, disabled, trans-man Clare writes: “In my reading of diagnosis, I’m not interested in whether I \textit{really} have cerebral palsy or whether schizophrenia \textit{accurately} characterizes the many realities of seeing visions and hearing voices. Rather I’m inviting us to think about what diagnosis does, because this system not only describes those of us deemed defective, deficient, or disordered in a million different ways but also shapes how the world treats us” (\textit{Brilliant Imperfection}, 42).
\end{itemize}
not of perfection, but of perfection deferred, a yearning toward the future that is separated from the here and now—all closures nonetheless. As such, “diagnosis is a tool rather than a fact, an action rather than a state of being, one story among many.” Much early work in music and disability studies seeks to examine how music represents a particular mode of body-mind difference in the wider world—be it blindness, deafness, body schematic difference, or intellectual disability. This difference is located at the level of the lived experience of the musician as biographical fact and/or figured in the metaphorical, singular body of “the music itself.”

In a sense, my reading of the Ligeti Trio will perform this kind of work, using disability studies as a lens or instrument to tell a story of dis/ability contained in the closed musical work. There is, however, an important distinction: the temperamental dis/ability I principally track may have analogs to various other modes of lived body-mind difference, particularly those who process information or communicate differently, but I will not pin down the multiple unruly body-minds at work in the Trio under the sign of a singular medical or legal diagnostic label, fictions that have been mobilized against innumerable body-minds that can be categorized as “different.”

I am rather more interested in how a dis/ability system is made and re-made here in musicking space. In my reading, the complete musical persona or the multiplicity of agents do not symbolically “impersonate” a disabled body; this is not virtual or simulated disability of a persona represented in sound or sounding-like. Rather, the instrumentalists in the Trio present actually different constitutions (soma and topos) and expressions (echos) of body-mind in interdependent social space; the Trio, then, is a disablist musical work that, in performance,

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Clare, Brilliant Imperfection, 45.
mobilizes body-mind difference at the level of the instrumentalist, truly laying claim to disability in “that the lived, experiencing body of the disabled person”—or the dis/abled instrumentalist—“is inextricably connected to ontology, ethics, and action.”

Let me be clear: I am not claiming that differences in instruments’ (or even instrumentalist’s) temperamental phoné reflect, mimic, or are as socio-politically important as eradicating the real difficulties and debilitating violences against those marked as disabled—or simply different, by any metric—experienced in the world “out there.” Western art music works take place in rarified spaces—imaginary museums and rituals of encounter—prized exactly for their detachment from the mundane world, a cultural space apart from the utilitarian, the utopic (non-)site of the composer’s voice and his devotees. Yet, in the drastic space of performance, these actions and transactions feel more than mere symbolic impersonations, for the orchestra is a heterogenous polity, and chamber music is a conversation in (and even about) sound. We act and live within these interdependent relations in the here and now, and the space—even if standing apart from the extramusical world “out there”—is never neutral or empty. I suggest that what opens is what Michel Foucault called a “heterotopia”: a localizable place apart from

86 Ibid.
88 In critical legal geographies, there is no neutral or empty space: “Social space can helpfully be understood as a social product, as constituted out of social relations, social interactions. Moreover, precisely because it is constituted out of social relations, spatiality is always and everywhere an expression of power”; Doreen Massey, “Space/Power, Identity/Difference: Tensions in the City,” in The Urbanization of Injustice, A. Merrifield and E. Swyngedouw, eds. (London: Lawrence and Wishart, 1997), 104; cited in Campbell, Contours of Ableism, 31. See also Cusick, “Gender and the Cultural Work.”
but that mirrors the real arrangements of society, a simultaneously illusory and very real space where these arrangements can be replicated, challenged, or overturned.89

Of course, while I claim that these technologically-mediated body-mind differences can be understood through a dis/ablist lens, the work nonetheless requires very able—or in crip speak, “severely abled”—musicians; the Trio is virtuosic for all participants.90 Technology is, in Robert McGinn’s estimation, “characterological,” having behavior and personality of its own, and, “challenging forth,” invites new somatic expansion and transmogrification, as we have observed with the digits upon the new valved horn in the Romantic, or even in the first encounters with the horn at the lips, creating embouchure.91 De Souza’s work shows how the instrument mediates the acquisition of skills and habits, and subjective and contextual expectations of the body at technological interfaces and their affordances. Body image (the concept of what the body is or should be) and body schema (the arrangement of the present, felt body) are thus fed through networks of material and ideological control and activation reinforced by sensory feedback loops.92 Ultimately, the consistency of these loops leads to a habituation of the body schema to the handiness and well-working of the instrument; the instrument feels part of the player’s body, incorporated, and seems to disappear.93 In the presence of such

89 Foucault, 350–6. Examples of heterotopic spaces in human geography include the rest home, the psychiatric clinic, prisons, and cemeteries; the theater and the cinema, the garden; museums and libraries; brothels and colonies. He also includes old age homes “because in a society like our own, where pleasure is the rule, the inactivity of old age constitutes not only a crisis but a deviation” (Ibid, 353).


91 Campbell, Contours of Ableism, 49.

92 Campbell (Ibid, 27) writes that “Ableism is an epistemology (a knowledge framework) and an ontological modality (a way of being) that frames an individual’s identity formation and, thus,” citing Judith Butler, “becomes the power ‘that animates ones emergence’ through complicity and resistance.”

93 Music at Hand, 45–8.
incorporations—such as with prosthetic limbs, phantom limbs, cybernetics, or musical instruments—“the edges of the somatic are not necessarily equated with the boundaries of subjectivity.”

When we—my horn and I—are working in our habituated patterns, we become one, and “my” musical affordances, cognition, and being are thus distributed between my techné of my somatic body-mind and that of my instrument, as with Stephen Hawking’s computer-assisted speech. Virtuosity can be understood as extreme fluency or smoothness within this technosomatic system. I feel myself and can be understood and heard as hornist, or even be eclipsed by my instrument, as in Cone’s formulation of the “musician-cum-instrument.”

But when my horn needs repair or when I do, or when we are asked to engage in unfamiliar choreographies as Ligeti demands—what de Souza refers to as “voluntary self-sabotage”—our smooth incorporation becomes stuttered, and our technicities become present-to-hand again. As a musical being, I am consubstantial with my instrument; therefore, inasmuch as the horn affords or (or does not), I find myself able (or not), and vice versa. As we have observed, even a single instrumentalist is both incorporated and intercorporeal, an assemblage of the body, affordances, and labor of the human executant and that of her instrument, in constant negotiation. To this we add that the notion that her body image and schema are always technologically mediated; she and the horn are always ultimately interdependent. For this reason, I will in my reading refer to each instrumental assemblage as pianist, violinist, and hornist and

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95 In fact, virtuoso performance can seem to exceed the boundaries of the merely human into the super human: while at the keyboard, Liszt seems to have more than ten fingers, or surely must, and Chopin’s wrists seem to breathe. These are the fantastic bodies of Szendy’s writing, but also explored in Davies’s “romantic anatomies of performance.”
97 Campbell describes that “expressions of dependency or interdependence are reliant upon the contingencies of complex material relations that have their textures and rhythms, producing very specific spatialities and affections” (*Contours of Ableism*, 178).
use the pronoun *they* unless the performance seems to demand further parsing of the incorporated techno-body. We engage the fullest sense of Szendy’s musical *corps à corps*, a phrase meaning not only body-to-body (contact), but carrying with it a sense of contest, maintaining presence of multiple bodies. “Part of claiming disability,” Clare insists, “is choosing this messy, imperfect work-in-progress called interdependence.”

Embodiment theorist Gail Weiss uses the term *intercorporeal* to describe the encounters of body image and body schema—implying the manifestation or proliferation of bodies in our immediate experience, both actual and virtual, material and ideated. “The experience of being embodied,” she writes, “is never a private affair, but is always already mediated by our continual interactions with other human and non-human bodies.” Weiss’s work demonstrates that these intercorporeal encounters are never neutral processes or wholly contained within the individual, but rather arise from complex interactions of the physiological, the psychical, the social, and therefore the political, from sensory and discursive feedback loops that, when met with our own disorderly or dependent bodies, give rise to relationships with alterity and abjection.

Temperamental dis/ability may not seem a problem writ large for the world—indeed, I don’t claim it to be. Yet Clare reminds us: “Which realities are defined as trouble by whom and for whose benefit? The answers extend far beyond exam rooms and research labs, public health policy and diagnostic codes…. It touches on the intimate relationships we have with our own body-minds.” If we return our attention to the *corps à corps* of musical practice, rehearsal, and performance, the Trio choreographs three heterogeneously incorporated agents—indisputably

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100 Clare, *Brilliant Imperfection*, 72.
vital, though with differing organological morphologies and abilities—interacting to facilitate the sounding of the score. Here in the heterotopia of interdependent and intercorporeal chamber musicking space, we might begin to perceive the value of troubled and troubling bodies: to point to the reified boundaries of normativity in any guise, and to imagine being otherwise, whether in here or “out there.”

Practices of Intonation and Crippng Temperament in Ligeti’s Trio (1982)

As I have insisted, mixed chamber music foregrounds differences in instrumental affordances even as Werktreue might, at many levels, insist upon their ultimate parity; this includes heterogeneity of timbre as we observed in Brahms’s Trio, and, as I will demonstrate, a variety of approaches to and ways of being temperamental in Ligeti’s. Implicitly aligned with McGinn’s notion of technology as characterological, Cone states that works do, in general, suggest their appropriate instrumental realizations; yet, despite his intention toward music’s materiality, his statement nonetheless reifies the pre-existence and ultimate priority of the work, disembodied, at least on an ideational plane.101 Ligeti once said, however, “All in all, you cannot hear my music as it appears on paper.”102 The difference is—as throughout these studies—in the mode of attention, of presence, and to what or whom, or more simply: to where it is that we locate music, and what it is that we think the music is and does. In line with Cook’s notion of music as process and Klorman’s theory of multiple agency, I suggest that “the work” does not merely (gnostically) suggest instrumental realization, but arises out of the drastic possibilities and (dis)abilities of characterological musical interaction between the instrumentalists, which are

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101 Cone, Composer’s Voice, 109.
102 In Conversation, 15.
only then captured and scripted into score and part and re-enacted—not merely impersonated, but re-enlivened—in performance.¹⁰³

In the following, I will read through various moments in Ligeti’s Trio where, in light of Siebers’s disability aesthetics, temperamental dis/ability inherent in instrumental execution and interaction is used to effective, productive ends. While the Trio highlights these differences by prescription in the third and fourth movements, we can become attuned to more subtle, implicit practices of intonational dis/ability in various moments of the first and second movements. Among these characterological instrumentalists, these temperamental differences can be sites for contest or invitations for negotiation, but in every case demanding not only presence but copresence—the awareness, modes, and senses of being with others.¹⁰⁴ Performance of the Trio begins with the tuning of three instruments, but moreover with the attuning of three instrumentalists; I hope that my presentation here will demonstrate how expression arises from such accommodations between temperamental bodies.

I. Andante con tenerezza

The opening of the work begins with a familiar gesture. In the notes for the premiere, Ligeti described it as “an ‘oblique’ variant of the traditional sequence for two horns,” and those that write about the Trio—including Ligeti himself, later—will often make reference to another variant of it: Beethoven’s pianistic Lebewohl that we examined in Chapter Two (ex. 2.4).¹⁰⁵ But

¹⁰³ Klorman, *Music of Friends*. My work expands upon Klorman’s in its focus upon the idiomatic qualities of the heterogeneous instruments as productive limits to social participation and in the centering of intonation as the musico-social practice under consideration.


¹⁰⁵ Ligeti citation is from Steinitz, “Genesis,” 189. Ligeti refers to this as “a false quotation from Beethoven’s ‘Les adieux’ Sonata as a germinal motive and as an ‘Hommage à Brahms’”; Ligeti, liner notes to György Ligeti Edition 7: Chamber Music, trans. Annelies McVoy and David Feurzeig, Sony Classical 01-062309-10, CD, 1998, 12.

Searby writes states: “This ‘horn call’ [that opens the Trio] relates to the opening of Beethoven’s Piano Sonata, Op. 81a ‘Les Adieux,’ a figure which is also used in Brahms’ Horn Trio” (*Stylistic Crisis*, 115). It is not
neither the hornist nor pianist play at the opening of the Trio; rather, it is the violinist alone playing in double-stops in the first two measures (ex. 4.2). The intervallic content of our now familiar horn fifth gesture (framed in ex. 4.3, transposed to show parallelism) has been, in Steinitz’s words, “altered,” creating an uncanny, defamiliarizing profile of the hornistic persona. The corde alto descends through semi-tones and the corde basse through a minor triad; the resulting vertical sonorities are a major third, tritone, and minor sixth. Like Beethoven’s Lebewohl, the gesture remains consistently recognizable to the analytical listener as a horn fifth despite the contortion.

Example 4.2. Ligeti, Horn Trio (1982), I. Andante con tenerezza, mm. 1–3

clear if the “figure which is also used in Brahms’ Horn Trio” refers to ‘this horn call’ or Beethoven’s Les Adieux. His notation compares Ligeti’s motto to Beethoven’s, but not to the archetypical horn call itself. Pace the discussion below: Searby chooses for his image Beethoven, not the anonymous hornist.

In his in-depth study of the sketches for the Trio, Steinitz notes that Ligeti’s “horn fifth motto” here appears to have been the product of an organic process of (re-)discovery of the horn’s immanent movement (“Genesis,” 184), rather than direct borrowing and distortion of the Lebelwohl model.

I have supplied, as in previous examples, the partials and valve combinations used (bottom stave) or implied (top stave). The bottom stave is labelled as if the hornist were approaching the passage with traditional fingering; the top stave as if the hornist were following Ligeti’s suggestion that “natural horn technique can be used in other passages than those for which it is specified, for example throughout the whole first movement” (program note in full score); the hornist would execute the first gesture on the “open” F horn, and then depress the second valve to lower the horn to standing in E to execute the second. Note that in the valve horn execution (bottom stave), the hornist effectively avoids p7, placing the functional minor 7th on more tempered partials.
In an essay on disability and musico-theoretical discourse, Straus notes that the musical “deformation” of sonata form identified by Hepokowski and Darcy requires an “image schema” of the gesture, a container against which a given iteration is compared.\textsuperscript{108} We have observed this at work in the musical topic (particularly in the distortion of the military topic heard in Beethoven’s \textit{Eroica}), but we can now refigure it through the language of embodiment and disability studies: a normative or “normate” image of the figure (a body image) is required to mark a particular embodiment (a body schema) as “deformed.” So in what way does this motto remain recognizable as a horn fifth—in what ways does it embody our aural expectations—when its pitch and harmonic content is modified? As Steinitz observes, Ligeti’s motto maintains the distention of intervals from its generator, though somewhat compressed.\textsuperscript{109} I add that the gesture—which had been divided between horn and violin in Brahms’s Trio iteration—is played by a single instrument sounding as if it were a pair, providing timbral consistency between the \textit{alto} and \textit{basse} components. To these qualifications I further submit that the violinist would almost undoubtedly perform the gesture, like the archetypical hornistic example (or in a symphonic iteration; cf. ex. 1.12), in more purely tuned intervals than a pianist’s \textit{Lebewohl} (ex. 2.4). In other words, the violinist’s ability to retain the contoured, timbral, and intonational imperatives of the horn fifth may \textit{all} be factors to enable recognition of the melodically “deformed” musical reference.

\textsuperscript{109} \textit{Imagination}, 255-6; and “Genesis,” 184.
Michael Searby identified this “distorted horn call”—a motto that will be maintained in various guises throughout the four movements of the work—as evidence of Ligeti’s late “non-atonality,” a musical language that is neither quite tonal nor quite atonal. Searby proposes that this “third way” of non-atonality was realized in triadic harmony in non-functional contexts, “tonally related musical features,” and traditional formal and phrasing structures—all of which the Horn Trio demonstrates well to formalist analysis. Yet Searby also notes that Ligeti was typically occupied more by “surface elements,” such as timbre and texture, than “structure.” Beyond the pitched content of the motto or triadic function—which the piano and notational staff demonstrate well—“the surface sound-world of tonality” sounded in the horn fifth is perhaps one that is also enhanced by its “just” intonation.

The violinist’s more or less pure-tuned horn fifth, unfolding over quadruplet subdivision of the pulse, presents a quality of resonance that welcomes the hornist, who enters in counterpoint with peaked, triplet-based gestures derived from the harmonic series. In the performance notes to the work, Ligeti allows that “natural horn technique can be used in other passages than those for which it is specified, for example throughout the whole first movement.” This technique is similar to Messiaen’s comme la trompe de chasse passage. For example, the hornist’s first gesture (ex. 4.2, m. 1) could be executed on a horn with a fundamental F (partials 3, 4, 7, and 5, accessed on the open F horn, indicated in the sounding ossia staff), the second gesture (m. 3) on a modified E horn (partials 9, 6, 7, 4, accessed on the

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110 Searby, Stylistic Crisis, 111-9.
111 Ibid., 18; 111–9.
112 Ibid., 162.
113 Ibid., 18.
114 Ligeti, Trio, full/piano score, 4. Recall also the mixed approach to the valved instrument in the nineteenth century described in chapter two, where valves was used as a “quick-crook” device.
second valve), and the third (m. 5) on F-sharp horn (partials 9, 6, 4; second and third valves on the B-flat side of the double horn) and, using the written C-sharp as a pivot, on D horn (partials 5, 7, 6, 4; first and second valves on the F side). In the above example 4.2, I have provided both (A) in the horn in F part, the way a player might approach the first few measures in common practice—with traditional fingerings—which would yield a relatively equal-temperament; as well as (B) in the sounding staff, the harmonic series and respective partials that sound, which also indicate how a hornist using Ligeti’s suggested “natural horn technique” would execute the passages. Crucially, these gestures do not avoid but rather insist upon the seventh partial, which sounds about 31 cents flat compared to ET (observed also in the example from Concert Românesc, ex. 4.1, above); played with the natural horn technique described, the difference is quite palpable. But even when the hornist plays the passage with the valves (and so, with pitch on the offending partials corrected) as scripted in the part, Ligeti places \textit{tenuto} markings above these “seventh partials” in each gesture; the result is that even in the relatively even-tempered, fingered valved horn performance, the pitch constellation’s derivation from the third octave of the harmonic series is clear (if not a bit distorted).\textsuperscript{115} The hornist and violinist alternate, dodging the principal rhythmic beat as they prompt each other to establish new centers of resonance. Intonation in this space would strive for a purity of harmonic sonority. In this manner, hornist and violinist move contrapuntally through an interdependent pitch space until they come to rest on open-voiced sonorities. The pianist finally enters (m. 10), distorting the violin’s motto in quintuple subdivisions of the beat, an intervallically “deformed” but equal tempered \textit{Lebewohl} that temporarily silences any response.

After several turns through this material, at measure 41, the hornist sounds a gestural sweep, an explicitly untempered glissando—using a similar technique to Messiaen’s “Appel”—through several iterations of the harmonic series (including at mm. 44, ex. 4.4), which the pianist (m. 45) and violinist (m. 52) echo, albeit imprecisely with respect to pitch content.

Or rather, each in their own way: the smear of the sextuplet harmonic series gesture in the horn is made more manageable without valves (an affordance that will be explored and exploited in the second movement), the pianist’s more disjunct iteration (but retaining narrower intervals in the main alto than in the main basse) nonetheless creates a wash of sound with the sustain pedal opened, and the violinist skitters in the most rapid, but arguably lightest, figuration for which pitch precision may not be particularly necessary.

A harmonic series–based attunement for this movement is confirmed in the final chord (mm. 133–42): while not derived from a single series, the spacing and instrumentation of the
chord create the effect of overtones, like a “distorted” or “deformed” pillar chord.\textsuperscript{116} The hornist sustains the bottom, a hand stopped G4; the pianist plays a collection of B-flats and Fs beginning more than an octave above that, the fifths and complementary fourths lending open space on the least tempered intervals afforded them. The violinist slowly ascends on harmonics through the pianist’s upper tessitura through fifths, then thirds, finally achieving a G8 above the pianist’s top B-flat, the violinist meeting the hornist’s tuning of the make-shift fundamental. While all instrumentalists might ideally fade together \textit{al niente} with the pedal’s sustain, the pianist’s five measure chord will have long since evaporated to a resonant aura and the hornist’s breath will likely have expired, leaving the violinist sparkling as a delicate overtone, the last to disappear from hearing.

II. Scherzo

The initial gesture of the scherzo is in an \textit{aksak} rhythmic pattern, an asymmetrical, three-accenct division of 8/8 meter found in Middle Eastern and South Eastern European folk musics that is, incidentally, named by the Turkish word for “limping.”\textsuperscript{117} Sounding in plucked thirds and sixths (the horn fifth’s initial and terminal intervals) and propelled by the \textit{aksak}’s asymmetry, the violinist sets brisk pace, which is then picked up by the pianist (mm. 1–7).\textsuperscript{118} The violinist next introduces a legato ascending figure in constant eighth notes, still organized by the “limping” rhythm that is likewise taken up by the pianist’s left hand, which crystallizes the ascent into a

\textsuperscript{116} Such as heard at the opening of the \textit{Eroica}, as identified by John David Wilson, cited in chapter one.

\textsuperscript{117} “Limping” can be understood as a kind of disfluency of motion: where normate bi-pedal motion is in balanced, proportional, simple time (i.e. 4/4 meter, organized into four pairs of duple eighth notes), limping is a kind of stuttered walk that gives rise to different accentuations and divisions of time (here, into two groups of three eighth notes followed by a duple).

\textsuperscript{118} The violinist’s pizzicato could be framed as a mild (and culturally tolerated) example of what de Souza terms “instrumental sabotage” (\textit{Music at Hand}, 15)—a concept that will be taken up in a moment—for the (generally) bowed string instrument. The resulting quick decay of sound and percussive attack of the pizzicato brings the violinist’s sonic affordances closer to those of the pianist.
single modal scale that begins anew each measure (mm. 8–11, ex. 4.6), while the violinist again takes up the *aksak*.

The repetition and consistency of the pattern enforce the kind of bodily training needed for pianistic movement; indeed, Ligeti would only a few years later base his “Fanfare” piano étude (Book 1, no. 4 [1985]) upon this same ostinato. The melody in the pianist’s right hand at first adheres to the confines of the measure; however, the hand begins to glide away in its own rhythms and propose new beamings over the barlines. Similarly, when the hornist takes up the *askak* from the violinist (mm. 27), their disjunct presentation emphasizes not every measure, but every fourth note, introducing different bipedal pattern of movement against the prevailing grid of the measure and the limping ostinato in which the pianist’s left hand moves.

Additionally, Ligeti writes for the hornist to execute the *askak*, scalar, and gliding melodic figures using a modified natural horn technique—making prescriptive the suggestion from the first movement—and with no attempt to suppress or correct the intonational effects on particularly non-equal-tempered partials as the domesticated hand hornist might.
In these ostinato and scalar passages, the hornist quickly passes through a number of traditionally “undesirable” partials—those that could not garner names in *Grove* (fig. 4.2)—which are descriptively marked in Ligeti’s score with inflected accidentals.\(^\text{119}\) In the case of the scale above (example 4.5), the hornist passes through several of these partials *qua* pitches before coming to rest on an ET-acceptable fifteenth partial (sounding E5) between the violinist’s octave As and below the pianist’s sustain, in-tune with their upper E. In example 4.5 below, the hornist presents their version of the gliding melody, salted liberally with untempered seventh and eleventh partials, before taking over the *aksak* at the end of the example. We can observe Ligeti’s reflection that “the valved horn is conceived as an amalgam of various natural hunting horns

\(^{119}\) Some writers describe these pitches as microtonal, and I prefer this designation to “out of tune”; however, microtonality often operates on other equal-tempered divisions, such as 24- or 48-tone ET, and often uses a distinct notation of accidentals. The accidentals Ligeti uses differ from these instances in that they are descriptive—referring to the effect of playing on untempered harmonics—and somewhat imprecise, in that the downward and upward pointing arrows notated do not refer to a consistent deviation from semi-tonal habitus. Here, the arrow which indicates a lowered B-flat refers to the approximately 31-cents flat that p7 or p14 would sit compared to ET, compared to the 49 cents sharp of the upward arrow on p11, or the 41 cents flat of p13 (which is always marked with a “13.”) At best, these accidentals can be considered only mildly prescriptive for the hornist. The lesser deviations of the major and minor thirds—those pitches which still garner names in *Grove*—are not indicated as such.
(where the seventh and eleventh partials play an important role),” which we also observed in the Messiaen “Appel.”

Example 4.8. II. Scherzo, mm. 55–61, horn part

We have observed de Souza’s consideration that “instruments provide the invariance that enables players’ body-sound coordination”—or control; such invariance leads to the instrument or tool’s transparency or “handiness” (Zuhandenheit), into a smooth incorporation. This is how a hammer or a horn can feel like a natural extension of the body schema rather than an addition upon it, retreating from consciousness. The instrument can be brought back into view or presence-to-hand (Vorhandenheit) by a moment of mechanical failure—such as a string breaking or a valve ceasing to operate—or through the player’s “voluntary self-sabotage,” here, by refusing to use the valves or using them differently. Ligeti’s scripted use of the horn in these passages is defamiliarizing for executants taught to approach the horn as an already chromatic instrument, rather than as “an amalgam of various natural hunting horns” with their own temperamental constitution. In her analysis of the Trio, for example, hornist Kristi Thelander writes that the movement “makes virtuosic use of natural harmonics, and the resultant out-of-

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121 Music at Hand, 15.
122 Ibid.
tune notes and microtones… require great flexibility and accuracy.” Thelander’s statement demonstrates expectations of executional ability for the hornist (virtuosity, or what from a disabilist perspective might be referred to as “severe ability”), instrumental idiomatics (natural harmonics), and stigmatized impairments (out-of-tune notes). In this matrix, we can observe some tension between the hornist’s executional instruction (her scripted somatechnics) and, in Weiss’s terms, the hornist’s body image.

While I have to this point broadened her notion of intercorporeality, Weiss’s work on embodiment deals primarily with the psycho-social relationship between (somatic) bodies (or body schemas) and body images, the experiences of our lived bodies in tension with the idea of what they appear to be, or the ideal of what they should be. The “socially-referred character of bodily existence” leads to a self-consciousness of the body’s presence or appearance as it moves through the world. Here, Thelander’s statement codes the expressed hornistic idiolect of pitch as “out-of-tune,” implying a temperamental dis-ease. To sound these partials in equally tempered space does demonstrate, perhaps, a lack of sociality of pitch, for they must be out-of-tune with or as compared with something. But it is difficult to ignore the connotation, even if the statement is intended as neutral: out-of-tune implies disorder, deficit, something that requires correction, that it should be in tune. As a musical subject, the hornist has internalized an image

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125 Campbell, Body Images, 46.
126 Campbell describes how medical epistemologies appear to be “common sense” and gain credibility in their connection to scientific-techno-medical apparatuses and their assumed objectivity. “One of the weaknesses of the medical model of disability is that it fixes upon the ‘problem’ of the individual (impairment inheres in the person) and ignores those aspects of impairment that are socially or biographically produced” (Contours of Ableism, 98).
127 Campbell engages in similar analysis of reportage surrounding the first successful hand transplant, in Contours of Ableism, 105. In the assumption or veiled hegemony of ET, I hear resonance in Campbell’s statement that
of her voice that, like the pianist’s, should sound chromatic, homogenous, and with equal 
temperament, encroaching upon not only the *topos* of the horn (and, as we observed in chapter 
two, the player’s *soma*), but the psychic life of the hornist. The hornist demonstrates an 
internalized temperamental ableism, evidenced the player’s training, linguistic coding, and the 
horn with its prosthetic valves, which in turn serve as the effective cure of hornistic deficit.\textsuperscript{128}

Campbell writes:

> The conditions of fabrication, of mimicking the abled-body, are 
> usually of a disembodied kind because it is assumed that flight 
> from the body will act as a distraction towards those assimilating 
> qualities of social conduct and deportment. In time, we will be able 
> to re-create normalcy by rebuilding or morphing the injured body 
> to a form that for all practical purposes replicates the old (whole) 
> form. New technologies, therefore, have the effect of re-
> conceptualising impairment in terms of provisional or tentative 
> disability, thus promoting ableism.\textsuperscript{129}

Similarly, and more simply, Clare notes that “cure doesn’t only follow the lead of our body-mind 
yearnings; it also pushes us toward normality.”\textsuperscript{130}

For the hornist, however, it is not the digital fireworks of fast scalar passages that make 
this gliding melody feel virtuosic. In fact, it is just the opposite—the fingers on the valves are 
significantly slowed and it is the embouchure which does the skipping.\textsuperscript{131} The natural harmonics 
used to such effect here do not, once familiar, impose new burdens; rather, they reinvigorate a

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\textsuperscript{128} Campbell, *Contours of Ableism*, 25: “For internalized ableism to occur there needs to be an existing *a priori* 
 presumption of *compulsory ableness*. Such passing is about not disturbing the peace, contain the matter that is 
 potentially out of place.”

\textsuperscript{129} Campbell, *Contours of Ableism*, 26.

\textsuperscript{130} Clare, *Brilliant Imperfection*, 180.

\textsuperscript{131} Steinitz makes an astute comparison of Ligeti’s Trio with Brahms’s Op. 40. While Brahms had written the Trio 
to be performed on natural (hand) horn, it rarely was; Ligeti’s Trio is written for the valved horn but asks that it be 
used, at times, as a natural horn (“Genesis,” 182).
latent technique by which the hornist has moved otherwise. Campbell critiques an ableist misrecognition: “What do we see in the wheelchair user—their confinement, the contraption, the not-possible rather than the smooth gliding carrying device that sometimes speeds?”132 Is what we perceive an invalid, or rather “an expanded corporeality… the norm does not possess?”133

Once the hornist becomes comfortable maneuvering without the prosthesis—or distributing her labor elsewhere in the incorporation—it becomes apparent that fluency may not be lodged in an ability to navigate the pitch content in any particular manner. Rather, like the pianist who does not have to think about intonation, at this moment the ensemble privileges the jouissance of movement—rhythm and agility, gesture and grazioso fluidity—over “correctness” of intonation. So while the notes may be “out-of-tune” with the prevailing order, they are tuned-in with instrumental affordances that present a multiplicity of ways to pursue agility and speed that would habitually be associated with fingerwork.134 For the hornist as with the wheelchair user, playing through the harmonic series in this way is really more of a letting go, setting aside expectations, digital burdens, and intonational standing in favor of freedom of movement.

III. Alla marcia.

The violinist and pianist play a highly machinic, rhythmic ostinato at a relative unison, marching a twelve-tone row in disjunct dyads (mm. 1–30; ex. 4.9).

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132 Campbell, Contours of Ableism, 49.
133 Ibid.
134 The violinist, of course, must use their fingers to produce most any change in pitch whatsoever. Yet if intonation becomes flexible for the hornist, we may similarly accommodate the violinist and privilege fluidity of digital—but perhaps less precise—movement across fingerboard and strings, bow and arm often moving with the aksak limp.
The presentation is isorhythmic: the rhythmic material recycles at a constant pacing of three measures, where the pitch collection cycles approximately every six beats. Virtuoso double- and triple-stopping from the violinist works to catch pitch material that is more readily executed by the digits of the pianist, and, by the rules of sociable intonation, the violinist should attempt, at least, to match the piano’s equal temperament. After three turns through the ostinato, however, the violinist begins to phase at the sixteenth note (m. 11), subsequently losing time after every second turn; the pianist remains fixed in their rhythm. As the violinist falls behind rhythmically

Example 4.9. III. Alla marcia, mm. 1–3


Campbell notes that the concept of techné refers to both skilled craft as well as poetic “bringing forth,” “desirous knowing that discloses technologies’ essence constituting the meaning of being in our age” (Contours of Ableism, 47). She compares this to the notion of “challenging forth,” (Ibid.) which refers to techniques (and technologies, or what I would collectively term technicities) of extraction, exploitation, and the exhaustion of resources; recall, for example, the work of the valves upon the horn in the nineteenth century and examined in the last chapter to fully extract and exhaust the resources of the horn. The first section of Ligeti’s Alla Marcia participates in such extraction and exhaustion of pitch content in the form of the twelve-tone row; the isorhythmic presentation recycles this pitch material as necessary to fulfill the four-square march imperative.
but still strives to maintain pitch coherence with the pianist, the pitch field becomes further saturated—presumably in equal-tempered intervals throughout, but perhaps not necessarily so—across the registers of both. Losing speed and perhaps control of intonation, the violinist presents dysfluency against the pianist’s invariable organization of time and pitch space (albeit figured in an paradoxically virtuosic manner).\textsuperscript{136} Recall Ligeti’s earlier statement: “I have always been fascinated by machines that do not work properly; in general, by the external world of technology and automation which engenders, and puts people at the mercy of, bureaucracies.”\textsuperscript{137} Despite the harmonic content’s debt to the original “horn fifth” motto—sounding major thirds, tritones, and minor sixths—the hornist remains silent; there seems to be no space for them in this machinic ecosystem based upon the co-option and serialization of their own phoné.\textsuperscript{138}

In the trio (mm. 31–104, ex. 4.10), the duple meter and rhythmic jerkiness of the march give way to flowing triple meter and cascades of horn fifths, beginning with the hornist and violinist.

\textsuperscript{136} See Wilbourne, “Demo’s Stutter, Subjectivity, and the Virtuosity of Vocal Failure.”
\textsuperscript{137} In Conversation, 16.
\textsuperscript{138} Campbell notes that “challenging forth” “forces a re-ontologizing, such as the creation of the human resource, standing in reserve, which also creates its constitutive outside—the useless body” (Contours of Ableism, 48).
Unlike the first movement’s presentation (or Brahms’s iteration), however, any hope of a space of pure intonation is dashed with entrance of the pianist. The instrumentalists move as co-eval subjects in a circular, equal tempered system: they trade material by switching registers and directions as needed, interchangeable as *corps* *alto* (moving in tones and semitones) and *corps* *basso* (moving in larger intervals).

As the traditional form demands, the march is reprised (mm. 105–34; ex. 4.11). This time, however, the hornist is anything but silent.
The hornist’s musical material is familiar: the broken arpeggio and triplet division of the beat are recalled from the first movement. However, Ligeti writes that the hornist is to play with absolutely untempered harmonics, the “bell in the air, the [hornist’s] hand not in the bell… cuivré,” and adds an instruction to “blare at full volume regardless of the violin and piano.”

The result is that the hornist shouts a fanfarish transformation of the work’s opening triplet expressed in idiolectical natural harmonics; moreover, with the hand out of the bell and the dynamic stretching timbre and pitch to the inharmonic breaking point, sociable intonation is not possible in any event. Ligeti once stated simply, “The fact is that we must not expect all music to conform to equal temperament.” The ostinato of the march is met with the hornist’s obstinacy, and the proposition of the first movement (cf. ex. 4.2) becomes a salvo here in the melee of the third.

The effect is that the hornist’s untempered pitches (p11, p7, and p13) fracture the equal-tempered space—and indeed, all the pitches do, for with the hornist’s hand out of the bell of the instrument none of the pitches are likely to be “in tune” with any other body—resulting in

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139 Ligeti, Trio, violin/horn part, 29.
140 In Conversation, 55.
consistent vertical simultaneities that are less than a semitone apart. By the downbeat of measure 116, the combination of rhythmic phasing, the patterning of the row in the pianist and violinist, and the hornist’s distempered fanfares in the middle of the fray result in a dense collection of major, minor, macro- and micro-seconds and their inversional equivalents. In the example above, note the simultaneous presence of the thirteenth harmonic of the horn, a “very flat” C-sharp (written G-sharp) against the C sounded by the violinist and pianist, which resolves to a G-sharp (written D-sharp) space that would have been just vacated by an equal tempered A-flat and now replaced with an equal tempered D-E dyad. The rhythmic and pitch phasing has been amplified by prescriptive intonational phasing.

This self-conscious sonic and visual display of hornistic “naturalness”—releasing a “wild child” brazenly displaying an impaired musical temperament, of both pitch and self-control—can be understood to “cause a commotion” in the music performance space. The hornist can or will no longer pass, ostentatiously throwing off their intonational prosthesis, bell to the sky. The hornist’s presentation reveals what the valved horn always has been: beyond being thought of as an amalgam of simple hunting horns (as in Ligeti’s statement, embodied in the second movement) or playing like one (as in Messiaen’s “Appel”), the hornist’s instruction here reveals that the valved horn simply is such an amalgam. In the slippery space between compliance and duty to Werktreue (which can only be somewhat described by the text of the score), the hornist is asked to make non-compliant, “deformed” and deforming sounds: we are asked to perform our dysfluent phoné for all to hear. The performance of crippled ontology and “masquerade” of leaking pitch space distempers the temperamentally-ordered space and the

normalized, normative order of musical being. Ligeti was once asked, “All that we have said refers back to what you mean about wanting order with a small admixture of disorder, does it not?” The composer responded, “Exactly.”

In formulating his aesthetics of disability, Siebers reflects upon the work that damage performs on a classic art work, and considers that “perhaps the accidents of history have the effect of renewing rather than destroying” the aesthetic object. Vandalism, Siebers argues, can “put the art object to use again,” reinvigorating its materiality and presence. Observing a Rembrandt in which the portrait subject was literally de-faced with sulfuric acid, Siebers notes that “the problem is not that the resulting image no longer belongs in the history of art. Rather, the riddle of the vandalized work is that it now seems to have moved to a more recent stage in aesthetic history, giving a modernist rather than baroque impression.”

Though Ligeti resisted the label of “post-modernism,” he nonetheless walked a line between the romanticization of tradition and the teleology of the avant garde. Indeed, in its manifestations of certain romanticisms—including the Brahmsian, Eichendorfian horn—Ligeti’s Trio was received as an about-face from his more obviously experimental works of the late 1970s. But is the work “a heavily distorted reflection of the music of the nineteenth century,” as Searby claims, bringing the music of the Romantic into the modern age? or is it that the

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142 The notion of “masquerade” is, in cultural disability studies, an amplification of Butlerian performativity, where the dis/abled person not only presents but heightens the visibility of their disability, generally to receive necessary accommodations; it was first proposed by Tobin Siebers, “Disability as Masquerade,” Literature and Medicine 23, no. 1 (2004): 1–22.
143 In Conversation, 55.
144 Siebers, Aesthetics, 9.
145 Ibid, 10.
146 Ibid. Coincidentally, recall that Ligeti’s only compositions between 1978’s Le Grand Macabre and the Trio in 1982 were two pieces for solo harpsichord, tuned to mean-tone temperament.
147 Stylistic Crisis, 156.
historical elements deployed here have been used to reveal the waning efficacy of musical modernism’s own imperatives? What, in fact, is the Trio distorting? In Ligeti’s view, certain systems of organization, such as twelve-note serialism and the equal temperament upon which it relied, “grew stale” and he sought ways to reinvigorate them.\(^{148}\) Rather than prescriptively microtonal or controlling concrète and spectral approaches to such destablization, however, Ligeti often aestheticized approximation along with executional precision, deviations that result as a function of embodiment’s variation.\(^ {149}\) Speaking of his Requiem (1965) with Péter Vándrei, he noted:

> I used the twelve-note chromatic scale in the Kyrie. But what you actually hear is not a chromatic scale, since the singers cannot help making mistakes in the intonation, which produces a kind of microtonality, dirty patches; and these ‘dirty patches’ are very important…. Listening to this piece, what you hear is not the twelve-note chromatic scale but all kinds of other intervals. Hence the difference between the score and what you hear…. My intention was to abandon the tempered scale.\(^ {150}\)

Searby reads that the score “defeated” the choir, requiring Ligeti to make concessions “to allow approximate intonation.”\(^ {151}\) From this perspective, the inability of musicking bodies to fulfill a score’s ideated body image presents a losing proposition for all parties in their intersubjective musical encounters: a lamentable, pathologized gap between score and performance, a failure of Werktreue by means of inability to adhere to Texttreue, which results in a mispronunciation of the composer’s voice. However, Ligeti’s statement indicates that planning for and even welcoming all-too-human “mistakes in the intonation” creates the desired effect—that to be true to the work is not necessarily to be true to the artefactual text—but moreover

\(^{148}\) In Conversation, 31–2.  
\(^{149}\) Of course, piano études (such as those Ligeti composed from 1985 until his death) present a site where the composer is seeking to fashion his ideal, “severely able” musicking body.  
\(^{150}\) In Conversation, 53–4.  
\(^{151}\) Stylistic Crisis, 7.
celebrating the non-determined, variable sound world that exists between the notes of the idealized tempered scale and their actual sounding.\footnote{Similarly, Ligeti also described that in the Trio, the hornist’s untempered harmonics “tend to throw the violinist’s fingers off their mark. This is intentional, part of the riddle of this non-manifest musical language.” Ligeti, liner notes to \textit{György Ligeti Edition} 7, 17.}

Disabled and disorderly bodies that cannot be brought back into the fold are typically institutionalized—hidden away from the public eye—in asylums, in hospitals, in jails. In Seth F. Josel’s analysis of the pitch material of the Trio’s march, he excludes the reprise entirely—or at least quarantines the horn’s effects in that pitch space—privileging instead the serial organization and coherent unity of melodic and harmonic space.\footnote{“Vertikaler und horizontaler Raum.”} But to not account for the hornist’s “dirty patches” is to miss the point. Moving outside equal tempered control, the hornist’s idiomatics qua idiolect provides for the crucial cut, like the acid upon the Rembrandt painting in Siebers’s example. When Ligeti compared the clash of tuning systems to the observation of “the body in a state of gradual decomposition,” he continued, “I do not think we need to look for other tonal systems—I abhor all fixed systems; what I really want is the effect of deviation from either pure or equal temperament.”\footnote{\textit{In Conversation}, 54 (emphasis added).}

And thus we observe Ligeti’s aestheticization of instrumental, temperamental, and human variation—so often coded as disabilities and dysfluencies—as a productive resource. In the case of Siebers’s vandalism it seems clear that the acid defaces the pre-existing portrait.\footnote{Interviewer Várnai quoted the poet Kosztolányi’s words as a motto for the composer, to which Ligeti acquiesced: ‘Blessed is he who brings the new; the new that is old but new to our eyes’ (70–1).} In the march reprise, however, Ligeti’s work provides both terms of the critique—row and horn call, equal and variable temperaments—setting the field for the \textit{corps à corps}, and the hornist’s commotion may thus posit a less teleological, more chiastic questioning: which is deforming

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which? Is it a eugenic aesthetics, that the horn’s non-compliance to equal temperament and chromatic saturation flies in the face of the march of human advancement? Or could it be more critical, acknowledging that the strictures of industrial imperatives and machinic systems—of temperamental ableism—have effaced other voices, postures, other modes of being?

IV. Lamento. Adagio.

For all the bombast and commotion of the march, the commonly-cited highpoint of the Trio occurs in the final movement, a passacaglia-lament. Ligeti described the overall form of the movement as follows:

A five-bar harmonic pattern (a variation of the horn fifths cell) provides the framework [the passacaglia] around which descending chromatic figures [the lament], increasingly become intertwined until eventually the five chords are completely overgrown. During this escalation, the piano undergoes a transformation, ultimately emerging as a gigantic imaginary drum, whose echo can be heard in the pedal tones of the horn. A strangely altered reminiscence of the horn-fifths cell appears in the piano and violin, like the photograph of a landscape which in the meantime has dissipated into nothingness.156

The “five-bar harmonic pattern” is an expansion and ossification of the first movement’s horn fifth motto that the violinist presents as a passacaglia, which is accompanied by a high register sustain from the stopped horn (mm. 1–5). Steinitz notes that “the opening four bars, containing concords of E minor and then of A flat minor, suggest a mysterious, Renaissance purity.”157 Steinitz’s hearing could, of course, be reinforced by its intonation: these concords on an already Pythagorean–tuned violin would be played with a more “pure” intonation, which is then undermined with the equal-tempered entrance of the piano, the first to present the lamento.

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157 *Imagination*, 259.
Following the march, we understand the polarity has been reversed: now the presence of equal temperament “dirties” the pitch space.

Borrowing from Steinitz, Stephen A. Taylor identifies three typical features of the lament motive in Ligeti’s late oeuvre: “(1.) It is a three-phrase melody, the third phrase of longer duration. (2.) Each phrase descends stepwise in semitones and whole tones, interspersed with upward leaps. (3.) Notes of greater expressive significance (e.g. immediately after the upward leaps) are intensified harmonically [generally with simultaneous semitones].”158 The lament presented here by the pianist in measure six certainly fulfills Taylor and Steinitz’s description, as the descent by major and minor seconds and implied “missed resolutions” prompt upward leaps.159 The violinist is the next to join in the lament; their keening becomes increasingly dense by virtue of dynamic and registral expansion as well as by rhythmic diminution—and likely with some subtle expressive intonation on the part of the violinist—“overgrowing” the passacaglia motto now in the pianist’s left hand (mm. 14–47).160

The horn enters the growth in the fifth cycle (m. 51), conspicuously mixing tempered and untempered pitches by Ligeti’s prescription; this is especially salient in the long held p11s, which fall approximately three-quarters of a tone below p12 and thus outside the affordances of ET embodiment. Unsurprisingly, some analysts have diagnosed the hornist’s lament as “mistuned,” perhaps hearing the expression of a decomposing body.161 “Once taught inconsiderable wrongness, how do we unlearn it, return to that time before the lessons began?”

159 Ibid.
160 In their study of grammatical code-switching, Penelope Gardner-Chloros and Malcolm Edwards disabuse the base grammar and deviations model that has been the disciplinary norm, instead advocating for understanding poly-ideoloeicism and the “variability of bilingual grammars” in code-mixing; “Assumptions behind Grammatical Approaches to Code-Switching: When the Blueprint Is a Red Herring,” Transactions of the Philological Society 102, no. 1 (2004): 103.
161 As Taylor does, in “Passacaglia,” 6.
Clare asks.162 “Or is there no return, no restoration, no cure, but rather acceptance, resistance, building anew amidst this dense thicket?”163 By choosing body-mind acceptance, we can turn away from the damaging dichotomies of an implicit “in tune” and its marked deformations, of normal and abnormal. This schema of the figure draws upon the hornistic persona’s—and the hornists’—re-composed body image from the previous movement and, through its “brilliant imperfection,” discernibly expands the notion of the melodic second to include the in-between already afforded by the hornist’s natural harmonics.164 The untempered abilities of the horn are brought to another use: to reclaim the individual qualities of lived intervals greyed out and overwritten in equal tempered chromaticisms.165 Less a commotion, the horn’s non-equal tempered pitches provide for heightened expression of intense affect. In performance, a hornist might exaggerate this distance from temperament, and so masquerade this reclaimed ability—once heard as disability—for affective power.

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162 Clare, Brilliant Imperfection, 166.
163 ibid.
164 “Brilliant imperfection” is the title of Eli Clare’s monograph, cited throughout.
165 An aim identified by Searby, Stylistic Crisis, xvi.
Example 4.12. IV. Lamento. Adagio, mm. 55–61
These long eleventh partials in the horn are later matched and intensified with the violinist’s tremolo, which increases dynamically and timbrally into a scratching sound (ex. 4.12, m. 60). The total effect is thus redirected from the beginning of the gesture (Taylor’s upward leap) to intonational variation, timbre, and duration as they occur at the end of the gesture. Emphasizing attack onset, as Taylor does in his figuration of the lament, demonstrates attunement to the affordances of the pianist; similarly, Searby’s locating the solution of Ligeti’s stylistic crisis in tonal harmony and traditional forms (as arose in the discussion of the first movement) demonstrates a pianistically-situated perspective. Rather, as Searby acknowledges but ultimately sidesteps, Ligeti was perhaps more attuned to effects of surface—timbre and intonation—for their productive potential.166

As the violinist and hornist keen their lament in tritones, the pianist’s lower register becomes, in Ligeti’s figuring, a mechanistic “gigantic imaginary drum” (m. 57 in the left hand, bottom stave). The pianist’s continuing lament becomes more and more fragmented, more percussive than pitched. Spread across four staves and the compass of the piano, the effect is that of the executant wildly beating the instrument.167

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166 Feminist linguist Sally McConnell-Ginet notes that men and women’s languages (broadly defined) are significantly differentiated in the domain of the paralinguistic and phonetic (echos): women tend to expend more articulatory effort and perform not only higher formant frequencies than men—which can be explained by somatic difference—but also a wider variety of vowel formants, giving a wider range of (linguistic) intonation—what are called “speech melodies”—between and even within syllables, a difference that is enculturated and performed (as technē) rather than located in material difference; “Intonation in a Man’s World,” Signs: Journal of Women in Culture and Society 3, no. 3 (1978): 541–559.

167 Writing about the end of the second movement of Schumann’s [Piano] Fantasy, Op. 17, Cone notes if the virtuosic passagework is interpreted as the executant’s struggle against the instrument, “we are endowing the composition with a spurious human protagonist to be portrayed by the musician.” This is, in Cone’s rendering, an illegitimate interpretation, for it “turns the performance into an athletic event.” Rather, we are to regard this as “the gesture of a pianistic persona that adopts extreme methods in order to express extreme attitudes, pushing the musician-cum-instrument to unprecedented efforts, the virtuosity required for its realization becomes a symbol of the strenuous musical context” (Composer’s Voice, 107).

That being said, Cone also seems to take issue with certain avant-garde works that make extraordinary demands on their performers, which for Cone includes improvisation, live recording and manipulation, “us[ing] their instruments for unusual purposes, and to do things completely unrelated to their musical abilities.” The effect is that the instrumentalists become “full-fledged play actors,” portraying characters in musico-dramatic fashion. “Whether
Inharmonicity is an acoustic property that results when overtones of a single pitch deviate from the whole number ratios of the harmonic series of its fundamental frequency. It is most readily found in cymbals and gongs— instruments of noise rather than instruments of music—and can occur as a function of extreme dynamic on any instrument, including the horn. But the phenomenon is also inherent, to a lesser extent, with struck strings such as those of the piano; the distortions of thickness in the string required to produce the lowest and highest pitches for the piano, in particular, results in an inharmonicity of overtones in the string, and as such, there is a sense that a given pitch on the piano is out of tune with itself. Due to this, it is customary to tune the octaves on the piano slightly larger than pure, in what is called “stretch tuning”; thus even as methodical a system as equal temperament may not work in practice as the ideal it had set before itself. The registral extremes of the piano here in the lament, then, amplify an already present dissonance in the system, material limitations of the techno-body of the pianist that can never conform to the image of transcendence equal temperament provides. Rather than the autonomous musicking body promised, the piano and its temperament emerge as (also) limited, disabled and disordered. From the perspective of the corps sonore, the pianist becomes marked as disabled and in need of accommodation, sounding the distuned lament of the decomposing body.

“Everyone is virtually disabled,” Campbell writes alongside McRuer, “both in the sense that able-bodied norms are ‘intrinsically impossible to embody’ fully and in the sense that able-

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an implicit musical persona can take shape at all under such circumstances is doubtful”—that is, he questions whether music with such “histrionic elements” can be called (instrumental) music at all (Composer’s Voice, 112).

168 Some research indicates, however, that the perception of inharmonicity is received as the warmth of the real piano, as opposed to its eradication in synthesized production. See, for example, Hanna Järveläinen, Vesa Välimäki, and Matti Karjalainen, “Audibility of Inharmonicity in String Instrument Sounds, and Implications to Digital Sound Synthesis,” Acoustics Research Letters Online 2, no. 3 (2001).
bodied status is always temporary, disability being the one identity category that all people will embody if they live long enough.”

In particular and with respect to intonation, the horn uses a mixture of valve-tempered (sensitive to sociality, shared language, and interdependent) and untempered pitches (working in their own system, idiolect, or with affected intonation when compared to another). The result is one of intense expression, perhaps “uncivilized” for its lack of self-consciousness, but highly emotive. Steinitz suggests that Ligeti may have heard such a lament figure in the stylized mourning of professional wake singers, and the performance of the hornist similarly requires a particular self-conscious virtuosity and sensibility. Yet, in a movement of such pathos, it reveals that control, evenness, and sameness become irrelevant and, perhaps, undesirable. If the violin’s executant must work so furiously upon her instrument and the piano’s notation stretches across four staves, it could be because the pitch space has become destabilized, fractured into an unrecognizable field. And if the piano has become a drum, it could be because its pitch content—gridded and fixed, fading, all attack and brash inharmonicity—is not enough to sustain songful outpouring: just as the horn is always a hunting horn, the piano was already a percussive instrument. Such a reevaluation demonstrates Siebers’s notion that “human qualification viewed

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170 In the linguistic intonation study referenced above (fn 166), McConnell-Ginet notes that the variable range of intonation employed by women becomes associated with “sounding emotional”: “It is possible that part of women’s being emotional in our culture derives from our sounding emotional. And we sound emotional because our everyday ‘tunes’—the patterns we use in ordinary circumstances where no extremes of emotion are felt or expressed—show a degree of dynamism found in men’s tunes only in extraordinary circumstances of heightened emotional expression” (“Intonation in a Man’s World,” 552).
171 *Imagination*, 255.
in isolation, based on individual appearance, has little meaning. Its meaning emerges by
association, placement in context, and aesthetic technique.”^{172}

This effect of “deviation from pure or equal temperament” would reach its climax in
Ligeti’s late Hamburg Concerto (1992) for solo hornist, orchestra, and an obligato section of
natural horns based in different fundamentals, for which concordance would be not only
impossible, but also evidently undesirable. Ligeti wrote that, in the Concerto, “I have not used a
regulated system so that the sounds, in self-organization, develop different tonal connections
other than those of the tradition.”^{173} The chief aim of modernist disability aesthetics is the
defamiliarization of the normate/ive, which “enlarges our vision of human variation and
difference, and puts forward perspectives that test presuppositions dear to the history of
aesthetics.”^{174} In the (post)modern case of Ligeti’s Trio, through disrupting the assumed center-
status of the equal tempered musical normate, it may be possible to recast the history of
temperament. (I. Andante con tenerezza) The three instrumentalists move in their own time and
space, sounding a music derived from the harmonic series, but according to their abilities. (II.
Scherzo) The instrumentalists dance together, moving across pitch material in their own way, in
pursuit of a shared rhythm. (III. Alla marcia) A highly regimented, twelve-tone march gives way

^{172} Disability Aesthetics, 45. Note that, in the Piano Concerto completed just a few years later, Ligeti writes for the
hornist to play similar untempered gestures from within the orchestra, and also uses the lament motif described by
Taylor, above.

One of the early definitions of musical temperament cited in the Oxford English Dictionary is that from E.
Chambers’ English Cyclopaedia (1728): “Temperament, in Musick, a rectifying or mending the false or imperfect
Concerts, by transferring to them part of the Beauty of the perfect ones.”

19 (emphasis added).

In Goehr’s figuring, the avant-garde and experimental disavowal of the composer’s voice (as in the works
of John Cage) does not relocate these works beyond the regulative work-concept, which we can read here in Ligeti’s
concept of “self-organizing” sounds. Goehr states, “While the movement puts the status quo into question by virtue
merely of its presence as an antagonistic ‘minority’ or ‘marginal’ culture, it none the less constitutes, at the same
time, part of what defines the culture as a whole” (Imaginary Museum, 270).

^{174} Siebers, Disability Aesthetics, 3.
to a flowing trio; in this new ecology and with the horn fifths passing between all instruments, the motto is fit to the fixed temperament of the piano. At the march reprise, the hornist causes a commotion, refusing to pass. (IV. Lamento. Adagio) A keening chromatic lament in variously tuned intervals sounds over an ossified passacaglia; the equal tempered piano’s own limitations thus revealed, the piano is reduced to a state of inharmonic percussion. Through such a radical distempering—that is, by disrupting the assumed musico-social order and turning the dominant narrative on its side—the Trio can thus be understood as “cripping” temperament and, through it, the expressive potentials of instrumental bodies.

**Beyond Claiming, Attunement: Musical Performance and the Ethics of Care**

Siebers’s and Straus’s artistic and musical aesthetics of disability demonstrate that modernist art is sourced in, lays “claim” to or “chooses”, and ultimately productively represents, in some way, disabilities in the lived world. Ligeti’s Trio harnesses the real relationships and variation between pitched sounds as a musical resource, and through the aesthetic encounter, we are able to call into question the musico-cultural construction of the able body, its sociality, and the labor of ablest discourse. But I again maintain that these presentations are not simply an aesthetic translation (that is, a re-presentation) of lived experiences or virtual worlds into an artistic frame. From the perspective of embodied performance, the score is not a transcendent signifying text pointing to a mundane signified, to a disabled body out there, but rather a script for the actions and interactions of real human and instrumental bodies, enacted in specific times, places, and locations—heterotopic as they may be—and creating openings. Having established standards for normate musical embodiment, and by always sounding through, with, and upon human and instrumental bodies, every music culture discursively and viscerally encodes and
actualizes its own unique forms and modes of dis/ability, of human and non-human
dis/qualification. All of these instrumentalists possess different affordances and thus different
abilities. Beyond flipping the script or inverting the hierarchies of “disability” and “ability,” the
corps à corps of “abnormal” and “normal,” the Trio provides a space where bodies meet.

Cone writes that musical performance turns on “the illusion that each performance [is]
presented as an experience as lived through rather than rehearsed;” that is, that the virtual agents
embodied in the musicians-cum-instruments are to feel surprise or fear in the moment of
performance, but that the performers themselves are not to supposed to feel such affects as they
enact the choreography. But why is rehearsing not living? And why is living not rehearsing?
I cite Goehr in response:

Music as an end could never, on aesthetic grounds alone, fully
justify the social or political means involved in its composition,
performance, and reception. The question, therefore, still asks for a
more satisfactory answer, one that will force us to think about
music, less as excused and separated, and more as inextricably
connected to the ordinary and impure condition of our human
affairs. The imaginary museum of musical works may well remain
imaginary, as it continues to display the temporal art of music in
the plastic terms of works of fine art, but it will never achieve
complete transcendence and purity while it allows human beings to
enter through its doors.

For, as Abbate insists, “Between the score as script, the musical work as a virtual construct, and
us, there lies a huge phenomenal explosion, a performance that demands effort and expense and
recruits human participants, takes up time, and leaves people drained or tired or elated or
relieved.”

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175 Composer’s Voice, 128.
As we encounter the temperamental bodies at work in the Trio, we sense a gap opening: between our expectations and what we receive, between handiness and presence to hand, between bodies and the images that we make of them. De Souza notes that the phenomenon of the phantom limb resides in such a gap, where a limb persists in the body schema even when excised from the body image; his musical example is the “phantom horns” present in the re- and disembodied horn fifth. The phantom limb can be read negatively as lack in the body schema, or more positively as an imaginative extension of the body image. Szendy’s Phantom Limbs reclaim the positive valence of these images that exceed their schemas—Chopin’s wrists that seem to breathe, or fantastical pianistic hands with more than ten fingers. Instrumental corps à corps brings forth poeitic “improbable bodies that are still without figure or destination.” Siebers’s aesthetics foregrounds such artful processes of corporeality and the interactions of the resulting bodies:

Art is materialist because it relies on the means of production and the availability of material resources—as Marx understood. But art is also materialist in its obsession with the embodiment of new conceptions of the human. At a certain level, objects of art are bodies, and aesthetics is the science of discerning how some bodies make other bodies feel. Art is the active site designed to explore and expand the spectrum of humanity that we will accept among us. That is, aesthetics are ultimately a rehearsal for—if not the principal site for—our ethical practice.

For Ligeti the recovery of these characterological abilities reveals new musical materials and interactions with which to compose, opening a “third way”—between the dualism of either/or—by which to create musical works, and in which to find his compositional voice.

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178 Music at Hand, 46, 164.
179 Phantom Limbs, 11.
180 Disability Aesthetics, 10 (emphasis added).
Through the imaginative re-organization of instruments and bodies and the voices they bring with them, music (including the Trio) accelerates physiological evolution, somatic expansion, and can anticipate future possibilities.\(^{181}\) Music as a practice becomes less about what it means or represents than the potential directions it, or we as performers, composers and listeners, can take. It becomes about the forces it (or we) can unleash. If music is a language, as Cone begins his essay, the question is: who do we allow to speak?

When we close music into a rarified sphere of “clandestine mysticism” and place works in imaginary museums, we relegate these unruly but always creative bodies and the challenges they present to us to the periphery, to “gray zones” where they needn’t affect our ethical positions in the everyday.\(^{182}\) Thus, the work-concept is not only a social aesthetic theory, but an ethical position. But as we have seen, not all the bodies that emerge at this encounter are transcendent or destined for the future, and their felt effects may be virtual, but are no less visceral or real. The “decomposing body” that we perceive at these drastic temperamental interactions suggests bodies that may not be able to fight, that can less afford, but rather that cry out for care. The presence of virtual agents or personas, representations—these anthropomorphized fictions of musical discourse—or of material limitations in real instrumental and human bodies in our midst, then, requires us to cultivate further tolerances.\(^{183}\)

Decomposition becomes an opportunity for recomposition not only for Ligeti, and not only for the instrumentalists, but for all of us—always copresent—as listeners.\(^{184}\)

\(^{181}\) Szendy, \textit{Phantom Limbs}, 109–12; also evidenced in Davies, \textit{Romantic Anatomies}.

\(^{182}\) Abbate, “Drastic or Gnostic?” 534; Campbell, \textit{Contours of Ableism}, 9: “It is not the event of denial that is operational; rather it is the ‘place’ or significance given to such ambiguous entities that disrupt the rather neat demarcation zones.”

\(^{183}\) Abbate, “Drastic or Gnostic?” 517.

As with instruments, impairment and trauma make the body present-to-hand.\textsuperscript{185} In her daughter Simone’s memoire \textit{A Very Easy Death}, Françoise de Beauvoir’s cancer-ridden body “forced itself upon her attention.”\textsuperscript{186} Beyond revealing categorical alterity, or forcing a gaze upon it, the presence of this failing body is the locus of a series of relationships between family, caregivers, and Françoise herself, activating responses that may not be determined in advance. Weiss reads here an “embodied ethics” of care that calls for attunement to bodily imperatives and situational needs.\textsuperscript{187}

Similarly, chamber music performance can be understood as a context in which the players enact various musico-social relationships.

The string player, making his own tones as he goes along, tempers his own scale. The quartet player, then, has to think of the just [that is, correct] intonation of his tones, not in diatonic relation or in relation to each other on his own instrument only, but in terms of the constant, self-engendered process of modulation as it is distributed among the four instruments. In other words, their purity is determined by their modulatory relationships.\textsuperscript{188}

The imperative to modulation implies not only an acceptance of others, but an active practice of meeting and moving alongside in a subtle but very real attunement.

At a certain level, both the subjects and objects of music’s sonic and linguistic discourses are aesthetic bodies, and ethics is a practice of what we do when we encounter them—the anomalous, the desirable, the monstrous.\textsuperscript{189} We may understand this as an awareness of


\textsuperscript{186} Quoted in Weiss, \textit{Body Images}, 131.

\textsuperscript{187} \textit{Body Images}, 158.


\textsuperscript{189} Campbell, \textit{Contours of Ableism}, 197: Critical disability studies and the study of ableism “has worked on disputing the self-evidence of categories/entities of disability and impairment, opened up dialogue around broader questions of anomaly and the place of both disgust and desire.”
relationships of interdependence and their need for negotiation, facilitation, or accommodation, or more simply, an *ethics of care*. For Weiss, an *embodied ethics* is grounded in dynamic, bodily imperatives that emerge out of our intercorporeal exchanges and which in turn transform our own body images, investing them and reinvesting them with moral significance. This moral significance… can only arise in and through our relations to others, relations which… provide the necessary conditions for autonomy [self-determination] to emerge. … To act in relationship is not to deny individuality, rather, it affirms my embodiment and that of others.¹⁹⁰

An embodied ethics will need to consider “the varying corporeal registers in which bodily imperatives present themselves, a process that requires closely attending to the specificities of lived bodies.”¹⁹¹ Thus, if music is not only a symbolic register but a drastic ecology of practices in and of itself, and, as Weiss maintains, attuning to bodily difference and imperatives is where our moral practice begins, the aesthetics of disability coded in the score invites an opportunity to rehearse an ethics of care.¹⁹² Chamber music is intercorporeal in attention, and, ultimately, the human executants committing to its drastic performance are engaging in a radical act: not only in expressions of unity or difference, but also in an ecological ethics based upon a willingness to work alongside to “foster dynamic interdependencies” in real experience.¹⁹³

The result is that, as a *performed* art, music is not simply an art-object reflective of or representing the mundane in virtuality, or of metaphorical decomposition or expansion. Music is also the practice, commotion, and recomposition of actual mundanity, using and using up real bodies, and the space opened in the rehearsal or the performance is a real opportunity to act

¹⁹⁰ *Body Images*, 158.
¹⁹¹ Ibid., 161 (emphasis added).
¹⁹² Ibid., 163.
¹⁹³ Clare, *Brilliant Imperfection*, 15, speaking of ecological restoration as an extension and materialization of such humane ethics.
otherwise: with care, with empathy. My point, quite simply, is that in talking about music, we are talking about no more and no less than life.

Here and now, we attend to and negotiate with human and non-human actors to reveal the abilities and voices of others and make visible the systems that mark them. In such a heterotopic space we might “catch glimpses of a world where many kinds of body-mind difference will be valued and no one eradicated; where comfort, pain, well-being, birth, and death all exist.” If music created, practiced, performed, or listened to is always an interaction between bodies—an encounter with their voices—then music practiced in a spirit of drastic openness provides us not just with positive models of disability that celebrate difference, but also with seemingly infinite opportunities to rehearse how, once we exit the heterotopia and return to our everyday, extramusical lives, we—as always-already interdependent, instrumentalized beings in the world—might facilitate and accommodate, tuning in to the differing abilities, needs, and modes of participation of others. Embodied performance makes not only dis/abled subjects or artistic objects, but also makes us constituents composing a world.

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194 See also Cheng, *Just Vibrations*, 10: “Without painting an exceptionalist portrait of musicianship, is it possible that people who work with music for a living can lead by example in agendas of interpersonal care and communication? Could we go beyond modest understandings of empathy as a complement to musicality, and venture empathy as a resonant form of musicality? If part of musicianship can involve listening for better worlds, then musicology has the potential to initiate various progressive currents in ethics and critical thinking.”

CONCLUSION

SOMETHING TO SPEAK

Throughout this project, I have observed that—contrary to received notions of music under the work-concept—music is often not transcendent, and that music and its instruments are never wholly stable. Music is a practice, something that exists only when others are willing to take it up, claim it, make it sound, and allow it to sound themselves. Any truths to which its phoné lays claim—or any truths we claim for it—are grounded in time and place, in history, and at all times built upon the affordances and abilities of soma, topos, techné. Bodies and instruments, scores and parts are the perspective from which we all can make music speak and the technologies of vision and audibility from which we speak about music.

We must at times search for consistency in these instruments, these bodies, these sounds, and the work therein functions to temporarily stabilize their choreographies and resulting echos. Re-performance can give rise to consistent feedback loops, normalizing some modes of sounding—re-sounding being—that both create and reify our knowledge claims.

In the first chapter, I examined normalized listening and analytical practices that created, out of the multiple agents sounding within the orchestra, a singular hero for Beethoven’s Eroica symphony. To counter this Werktreusische approach, I proposed that we “make the horns the heroes,” invest in their fortunes, and see what kinds of readings come out the other side. I believe that a similar approach could be taken up from many different perspectives in any number of works. Concertos, of course, propose their own protagonists. And, despite Cone’s dissuasion, why not attend to the English hornist for the whole of the Symphonie Fantastique?1 In the

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1 Edward T. Cone, The Composer’s Voice (Berkeley: University of California Press, 1974), 124: “A true instrumental protagonist in a symphony is the solo viola in Harold in Italy; it is equally obvious that one does not
process, we would observe that this musician-\textit{cum}-instrument is actually the second oboist who takes up the \textit{cor anglais}, like a \textit{corps de rechange}; to follow only the instrument in a manner that effaces its executant misses so much of the player’s experience and knowledge.

In the second chapter, I considered the horn \textit{itself} as a romantic “technology of timbre.” The redistribution of the horn’s musical \textit{echos} through new configurations of \textit{soma} or \textit{topostechnics} was also, at the same moment, a “romantic anatomy of performance” that functioned as a technicity of the regulative work concept. As I suggested, a similar movement could be observed in other instruments, such as the increased keywork on the Boehm system flute and clarinet, the briefly-attempted keyed guitar, or in the various actions on pianos, especially when compared to the almost direct touch and sentimentality of the clavicord. The horn was, of course, only part and parcel of much larger shifts in industry, science, and biopower in music and far beyond in the nineteenth century, and the history of the horn could both contribute to and benefit from a larger cultural context, particularly after mid-century.

In the third chapter, I “touched voices” to probe how the organological and conceptual voice might speak to instrumental studies, and how instrumental studies might contribute to the challenge of a naturalistic, unitary location or source of the voice by redistributing \textit{soma} and \textit{topos} through \textit{techné}. For the pedagogues and praxis-focused: since vocal and lip-vibrated aerophones share material \textit{likeness} (in the use of flesh and air), how could knowledge of vocal pedagogies and practices continue to enhance performance of the horn, and vice versa? From the performance studies perspective, how can we begin to account for the hornist who has played Beethoven, Brahms, and Ligeti in her sounding of Messiaen’s voice? How might we understand

\underline{have to consider the entire \textit{Fantastic Symphony}, or even the entire third movement, from the point of the view of the English horn.”}
the choreographies of works that are not based within the composer’s corpus or around their filiation? How might that recompose the way we do music studies, more broadly?

In the final chapter, I take the perspective of the horn as a kind of dys/technology of identity and read for the ramifications of corporeal, somatechnic difference that yields productive difference of phonē in heterotopic musicking space. How might such difference and ethics play within the larger schema of single concert, with multiple works? And how do we continue the work after the performance event has ended, in our future performances, written, played, or in the everyday?

Unintentionally, all the pieces I examined in this project reference the natural horn in some way, even if written for the modern valved horn. This was not a conscious decision. To some extent this was an effect of my repertoire preferences, and those of the canon more broadly—for the modern horn was not developed and widely distributed until the mid-nineteenth century. But as I observed later in the project, this was also due to the salience of the natural horn as an immanent mode for even the modern valved instrument. In total, the horn’s particular and various idiomatics—pitch topographies and resulting intonational and timbral variances, as well as its heavy imaginaries—present crucial moments of dissensus, disrupting our smooth, gnostic, transcendent aesthetics to remind us of a “hornness” of the horn before us, no matter how indifferently musical it can (seem to) become at times.² Like the failure of Heppner’s fluent vocal instrument, these characterological moments bring to consciousness the horn as a particular mode of instrumental extension, and the horn’s unruly opacity in these moments brings these works, perhaps more than others, to the hornist’s attention, and perhaps to yours.

In performance-based approaches to musicology, we attend to music as action, often rendering the *soma* as a counterpoint to Romantic musical *echos* and *logos*. The body becomes meaningful for the amplification or reversal of musical meaning. But somehow, we continue to make recourse to narrative literature—lexical, written, fixed—for so much of our work, just as I relied on Calvino’s articulations. What interventions might our sister performing disciplines, especially those always grounded in the movement of the body—dance, performance art—have to make, to teach us, even in common practice musicking? What does theater, opera studies, voice studies have for those of us working in instrumental realms? And how, in the wake of the material turn, can the more obviously always-already *somatechnics* and habituated intimate *corps-à-corps* of instrumental performance speak back to those disciplines’ more subtle choreographies and entwinings of the biological and technological long before the post-human age?

No matter how smooth or stuttered the incorporation, how fluent or dysfluent it may become, an always-already grounded musical being (virtual or actual) forecloses certain modes of sounding. In 2014, the summer before I began my doctoral studies, I began working with Canadian composer Andrew Noseworthy on a piece for solo horn and fixed media. I explained to Noseworthy that I wanted a solo work that used more of my capacities for sounding, rather than “just” the horn and its normalized palette of extended techniques. “I am a *musician* who plays the horn,” I said. Percussionists get to clap, to speak—even play the conch shell or furniture—when scripted by a composer to do so, and these gestures and the *phoné* of these body-instrument interactions are aestheticized as a normalized part of their musicking.³ Their instruments are

³ Such as in Reich’s *Clapping Music* (hands); Cage’s *Living Room Music*, which includes movements for household objects and architecture played as percussion instruments, for speaking voices intoning—through speech or song—
seemingly endless. What I was concerned about—though I couldn’t have articulated it at the
time—was the *horn*’s effacement of my musical body, which meant that certain aspects or
potentialities of my musical technique were relegated to the periphery: out of sight, out of
earshot, out of mind. How to disarticulate us, my horn and me, to examine them each and in
turn? How to make my mere humanity musically useful? What about “my” voice?

A summer later, before the collaborative work was completed, I fell on my face, scraping
my left cheek near my eye socket and, much more crucially, biting into the tissue of my upper lip
somewhat severely. My embouchure was broken, my performing body’s carefully trained
assemblage rearticulated into simple but damaged human anatomy: for weeks, my tongue
prodded the unfathomable softness of the swollen flesh of the back of upper lip, which had been
caused, in fact, by teeth to lip—aggression by my body against my body, *corps-à-corps*. This
apparatus was redistributed into isolated muscles that, despite the earnestness of intention, could
not render these now useless, swollen pieces of flesh into anything of value, no matter how we
attend to music’s *phoné*. My lips could barely make a sound, and what sound I could push into
the now impossibly small mouthpiece could not serve. Intonation, dynamic, pitch and rhythmic
response, articulation were all but obliterated; far from singing, I felt unable to speak.

My project—both with Noseworthy and throughout this document—nonetheless relies on
a perfect—or nearly perfect—performance of music, and thus on a performer or musician with
what Abbate called “superhuman” capacities, *techné* entrained in the body so as to have become
part of the very flesh. I trust that the composer “knew what he was doing” as he gave written
form to his ideas, even as I tease other “meanings” and interpretations out of its performances. I

and layering bits of Gertrude Stein’s “The World is Round,” and an optional “Melody” played on “any suitable
instrument”; and Chávez’s *Xochipilli* (conch shell).
have faith in the words and ideas of scholarly interlocutors, of the ability of my own writing to reach a sympathetic reader, just as I trust my soundings to reach attentive, open ears. I lean heavily on the shoulder that these great works provide, on the staidness of their voices, uncracked, unbroken. Beethoven’s hero is raised in the right-sounding of the collective polity, and Messiaen’s hornists were always the “marvelous” horn players he required. Brahms’s horn requires our sonic tolerances to hear (or ignore) its human origins; Ligeti’s crippling hornist is, of course, a virtuoso. But how can our listening, our scholarship, our musicking take into account those who cannot achieve such superhuman (or diabolical) transcendence? What about all the times that we try and fail in our efforts, when we split, crack, flub, break? Mellifluous and ultimately fluent voice carries a heavy burden in musical performance and the performance of musical knowledge. Beyond redistributing music’s phoné, it may be time for musicology to take in more completely the ontologies, epistemologies, and phenomenologies—and the aesthetics, politics, and of course ethics—of failure and dysfluency as more than mere noise.

As the swelling receded, I was left with an invisible but tactile impairment to this flesh that carried aural implications. To this day, a small nodule of scar tissue sits exactly where the inner rim of the mouthpiece and flesh of the lip meet on my left side, where the amplifier meets my body, and the material of the lip itself seems bit soft to the touch. The fleshy excess of hypertrophic scarring within my lip can hamper ideal vibration, causing cracked or

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nonresponsive notes; the slight atrophy at the surface causes air leakage in certain registers. In this way, impairment of the tactile mechanism effects my aural extension and my sense of identity.

Similarly, I echo Berger’s call for a space for the consideration of trauma within the context of disability studies, trauma that not only makes disabled body-minds but that continues to destabilize them, that inflicts and re-inflicts pain that puts autonomy and rationality into question. (On the other hand, Berger insists that disability studies suggests political inadequacies in trauma studies.) From such a perspective—one that takes into account the real lived experiences of disabled body-minds—disability is not a tragedy, a stigmatizing label, or a celebratory badge; it is a complex predicament that requires acknowledgement and care. Compassion, as Berger describes, is not an emotion but a mode of cognition, or what I have called *attunement.* The dys-/disarticulate connects disability and trauma (as Berger suggests); moreover, it puts *phoné* in movement, with the potential to reorganize our concepts of material, aesthetic, and political voice, opening a space where music as a practice may not only be a representation, but have much to say for itself.

The work with Noseworthy was completed in 2016 and premiered in early 2017. It was titled *Somewhat Speak* and was, at my insistence, subtitled “for hornist and fixed media.” The

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8 Ibid., 179.

9 Eli Clare also reminds his reader of the “right-to-die” legal case of Terri Schiavo: “She was a white woman who collapsed one day, her body-mind changing radically in a matter of minutes as oxygen stopped flowing to her brain and then started again. Some say she lost her ability to communicate, to think, to feel. Or perhaps we lost our capacity to listen”; Eli Clare, *Brilliant Imperfection: Grappling with Cure* (Durham: Duke University Press, 2017), 29.

piece requires vocalizations (away from the horn) and silent theatrical gestures—but these are really just preparatory gestures for speaking or playing, aestheticized. It also includes traditional playing and singing-and-playing, often in very close intervals that create beating interference between the vocalizations of the player, struggling to escape the throat, and those of her instrument at the bell. Noseworthy and I also worked together to “prepare” or “sabotage” the instrument by semi-removing—disarticulating—the valve slides of the F side of the double horn, which truncates the length of the horn severely when those valves are depressed, giving me only a few partials with wide, unpredictable envelopes and partial profiles. The resulting sound is softer and lacks the brilliance and projection of the orchestral horn’s traditional sound—it sounds a little bit like hand stopping—and disorientingly for the hornist, it emerges from the middle of the corpus rather than its end. The hornist’s phoné in Somewhat Speak labors between and across various topos and techné: vocalization, singing-and-playing, the “impaired” side of the instrument and the “non-disabled” side. Through this “cripping” of the hornist’s voice, vocality is recontextualized—following Kane, we could say redistributed—and “dysfluency” becomes productive difference within the single incorporated instrumentalist.

In the performance of the work, my vocalizations away from the horn are hesitant, stuttered phonemes and failed attempts at speaking. The fixed media part is distributed between left and right speakers, moving its acousmatic sounds around the hornist and her witnesses. It is not obvious to the listener, but Noseworthy created it entirely from my own heavily manipulated and reconstructed playing and speaking from our initial discussions, especially the utterance I am a musician who plays the horn.
Cone would argue that this is, perhaps, not really a musical work, for all its “histrionic element.” Cone says that, under such conditions, the instrumentalists become “full-fledged play actors”:

True, as characters they may be called upon to play their instruments; their real job, however, is not he playing but the impersonation. For as characters they are likely to have to do a number of things besides simply playing: to improvise, to record their own performances, to playing against recordings of their own performance, to use their instruments for unusual purposes, and to do things completely unrelated to their musical abilities. Whether an implicit musical persona can take shape at all under such circumstances is doubtful.\(^1\)

Maybe he’s right. Perhaps agency so assigned is not virtual, but actual. Maybe it is not a detached aesthetics—if such a thing exists, but research into the nature of musical, sounding being.

The seventeen-minute work is grueling, taxing upon my embouchure, my vocal folds, my mental capacities, even upon my valve slides as I slide them in and out of the horn to prepare the instrument, metal slowly grinding down metal. Music is not, is never, inexhaustible—it is ephemeral, and it can be painful as it moves through and across various materials, working back upon them, to ultimately leave us with nothing in our hands to show for it. This is another peril of the drastic, the “grudge against music,” that after all our efforts in performance, we can feel as if we are left with nothing at all except our scars. Hence musicology’s reliance on the written document—the score, the review, the analytical write-up—the archival trace that something happened. But my work on *Somewhat Speak* with Noseworthy anticipated all my questions here—questions of agency, timbre, voice, and identity, of bodies and instruments—and, in its short form, often posed and answered them more eloquently than I can in my written words. That

\(^1\) Cone, *Composer’s Voice*, 112.
is, this product of performance-creation was a mode of knowledge production and, for some of my listeners, research dissemination in and of itself. Following the lead of performance studies and our music studies colleagues in Europe, American music studies might need to take seriously performance and practice not only as texts to be read, but a way of speaking our knowledges, without the loss in translation into our virtuosic academic writings.¹²

To close, I entreat another voice. In her essay upon the openness of lips, Irigaray wrote:

Because we are always open, the horizon will never be circumscribed. Stretching out, never ceasing to unfold ourselves, we must invent so many different voices to speak all of “us,” including our cracks and faults, that forever won’t be enough time. We will never travel all the way round our periphery: we have so many dimensions. If you wish to speak “well” you constrict yourself, become narrower as you rise. Stretching, reaching higher, you leave behind the limitless realm of your body. Don’t make yourself erect, you abandon us. The sky isn’t up there: it’s between us. Don’t fret about the “right” word. There is none.¹³

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For examples of alternative modalities of research presentation, see Joni L. Jones, “‘Sista Docta’: Performance as Critique of the Academy,” *TDR/The Drama Review* 41, no. 2 (1997): 51–67, and a number of other articles *TDR*.

APPENDIX A

Classification of Instruments per Hornbostel and Sachs

Reduction for focus on “trumpet”/lip-vibrated aerophones

1. Idiophones—“The substance of the instrument itself, owing to its solidity and elasticity, yields the sounds, without required stretched membranes or strings”—xylophone, gong, cymbal, maraca, anvil, glockenspiel, celesta

2. Membranophones—“The sound is excited by tightly stretched membranes”—timpani, snare drum

3. Cordophones—“One or more strings are stretched between fixed points”—violin, harp, piano, harpsichord, monochord

4. Aerophones—“The air itself is the vibrator in the primary sense”

41. Free aerophones—“The vibrating air is not confined by the instrument”—whip, siren, harmonica, accordion, organ reed stops, bagpipe drone pipes

42. “Wind instruments proper”—“The vibrating air is confined within the instrument itself”

421. “Edge instruments or flutes”—A narrow stream of air is directed against an edge—flute, recorder, whistle, panpipe, jug, organ flue stops

422. Reedpipes—“The air-stream has, through means of two lamellae placed at the head of the instrument, intermittent access to the column of air which is made to vibrate”

422.1 Oboes—double reeds—oboe, bassoon, aulos, bagpipe chanter

422.2 Clarinets—single reeds

422.21 (Single) Clarinets

422.211 With cylindrical bore—clarinet

422.212 With conical bore—saxophone

423. “Trumpets”—“The air-stream passes through the player’s vibrating lips, so gaining intermittent access to the air column which is made to vibrate”

423.1 Natural trumpets—“Without extra devices to alter pitch”

423.11 Conches—A conch shell serves as trumpet.

423.111 End-blown.

423.111.1 Without mouthpiece.

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423.111.2  With mouthpiece.
423.112  Side-blown.

423.12  Tubular trumpets.
423.121  End-blown trumpets—“The mouth-hole faces the axis of the trumpet.”
423.121.1  End-blown straight trumpets—“The tube is neither curved nor folded.”—natural trumpets, straight hunting horns (also called foxhorn), digeridoo
423.121.11  Without mouthpiece.
423.121.12  With mouthpiece.
423.121.2  End-blown horns—“The tube is curved or folded” —natural horns, animal horns, bugles, most alphorns, luurs
423.121.21  Without mouthpiece.
423.121.22  With mouthpiece.

423.122  Side blown trumpets.
423.122.1  Side-blown straight trumpets
423.122.2  Side-blown horns

423.2  Chromatic trumpets—“With extra devices to modify the pitch”
423.21  Keyed trumpets—keyed trumpet and bugle, ophecleide, cornetto
423.22  Slide trumpets—trombone, slide trumpet
423.23  Valved trumpets—valve trumpet, valve horn, alto horn and other saxhorns, Wagner tuba, euphonium, baritone horn, valved trombone, tuba.
423.231  Conical bore
423.232  Semi-conical bore
423.233  Cylindrical bore

Summary of Select, Subsequent Revisions:

Curt Sachs

Note that here, the folding or bending of the tube is what classifies a trumpet-type aerophone as a “horn.” Folding or bending has but slight bearing on the sound production, and seems to refer more to European historical antecedent of the visual form of the instrument rather than an acoustic property that differentiates between the two. Later revisions (below) identify the distinction between trumpet-type and horn-type as bore shape—cylindrical, conical, or in between—and promote it as the first level bifurcation of the 423 type.

5. Electrophones—electronic organ, electronically controlled pipe organ, synthesizer, Theremin, ondes Martenot

Edward A. K. Ridley

The catalog, dedicated to the Adam Carse European wind instrument collection at the Horniman Museum, labels 423 “lip-activated aerophones” as “Group C,” and, crucially, also reorganizes largely according to bore shape.

Group C [423]
TYPE 8: Lip-activated side-hole instruments, as a boundary type between group B reed instruments and group C—cornett, serpents, keyed bugles, ophecleide

TYPE 9: Trumpets and Trombones—“Two distinct names have come to be attached to what may well be regarded as two forms of one instrument”—cylindrical bore, whether natural, valve, or slide

TYPE 10: French horns—long, conoidal, whether natural or valve; in Europe, largely tied to the visible form of the instrument, long and wound

TYPE 11: Cornets and Bugle-Horns—shorter, conoidal, whether natural or valve

Tetsuo Sakurai

Following a suggestion by Osama Yamaguchi and a new system proposed by Jeremy Montagu and John Burton in 1971, Sakurai’s proposed system bifurcates the aerophone class into “reed-vibrating” instruments, including lip-vibrated examples, and air-vibrating instruments. I include it here for the placement of mechanical reedpipes and lip-reedpipes into the same category, though Sakurai does not distinguish between reed material or single or double structure in this brief overview. His approach has not gained traction in English-language organological scholarship.

N.B. The division into “straight” and “bent” tubes speaks to the “abstract shape” of the “object sui generis”; the bassoon’s tube, for example, is in fact doubled inside the instrument, making a kind of U-shape (like a saxophone) that is hidden from view.

* 3. Reed-vibrating instruments
* 31. With single vibrator
  31.21 Straight-tube type
  31.21.22 Plural sustaining sound instruments—oboe, clarinet, bassoon

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31.22     Bent-tube type
* 31.22.22 Plural sustaining sound instruments—saxophone, horn, trumpet, trombone
32.    With multiple vibrators—reed organ, accordion, bagpipes
4. Air-vibrating instruments—flute

Jeremy Montagu
Montagu is here principally concerned with small corrections that can be added to H-S as it stands; however, his attention to aerophones significantly influences later revision.

* 422. Suggests to change principal bifurcation to bore shape (rather than single or double reed), since instruments can be quickly assessed for bore shape but reeds may not be available to the organologists, and since bore shape is the principal determinate for timbre and acoustic behavior\(^8\): e.g. reedpipes of cylindrical bore; reedpipes of expanding bore [however, he does not provide the reorganization of H-S 422]

423. [retains label *trumpet*, but prefers *labrophone* among the new terminology\(^9\)]
  423.2     Chromatic trumpets—“With extra devices to modify the pitch”
  423.21    Trumpets with fingerholes
* 423.211 With cylinder bore—key trumpet
* 423.212 With (narrow) conical bore—cornetti
* 423.213 With (wider) conical bore—key bugles, serpents
  423.22    Slide trumpets—“The tube can be lengthened by extending a telescopic section of the instrument”
  423.23    Trumpets with valves—“The tube is lengthened or shortened by connecting or disconnecting auxiliary lengths of tube”
  423.231   Valve bugles—the tube is conical throughout [* except for tuning slides]
  423.232   Valve horns—the tube is predominantly conical
  423.233   Valve trumpets—the tube is predominantly cylindrical

MIMO\(^{10}\)
(Museum of Musical Instruments Online, an international consortium of museum organologists)
Reorganizes the chromatic category by bore width and shape, then compass length:

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\(^8\) Ibid., 11.
\(^9\) Personal communication.
* 422. Maintain principal division of reedpipes by number of reeds (double or single)

* 423. Label change to ‘labrosones’ (or ‘lip-reed instruments’):

423.1 Natural labrosones without extra devices to alter pitch—*trompe de chasse*, shofar, natural orchestral horn (including crooks)

423.2 Chromatic labrosones With extra devices to alter the pitch while playing

423.21 Labrosones with fingerholes—*cornetti*, key bugles

423.211 With cylinder bore—Keyed trumpet

423.212 With [narrow] conical bore—*cornetti*

423.213 With [wider] conical bore—Key bugles, serpents

423.22 Slide trumpets—European trombone

423.23 Labrosones with valves

423.231 Valve bugles—The tube is predominantly conical

* 423.231.1 With narrow bore

* 423.231.11 With short air column (less than 2m)—Flugel horn

* 423.231.12 With long air column (more than 2m)—Wagner tuba

* 423.231.2 With wide bore—Euphonium, tuba

423.232 Valve horns—The tube is of intermediate bore profile\(^{11}\)

* 423.232.1 With narrow bore

* 423.232.11 With short air column (less than 2m)—Cornet, F alto horn, B-flat altissimo horn

* 423.232.12 With long air column (more than 2m)—Most French horns

* 423.232.2 With wider bore—Althorn; tenor and baritone saxhorns

423.233 Valve trumpets—The tube is predominantly cylindrical

* 423.233.1 With short air column (less than 2m)—Most valve trumpets

* 423.233.2 With long air column (more than 2m)—Most valve trombones

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**Roderic Knight (K-Rev.)**\(^{12}\)

Label change to “lip-reed”: Compass width [usually a function of length, c.f. MIMO above] becomes primary division

\(^{11}\) Note that, because of the inclusion of greater and greater lengths of tubing for the valve section, the modern horn is considered to be of “intermediate bore profile” between conical and cylindrical, or only “predominantly conical” in Montagu.

* A[erophone]23 Lip-reed
* A23.1 “Narrow compass”—fox horn, cor de chasse, shofar, conch shell
  * A23.11 fixed length
  * A23.12 variable length

* A23.2 “Wide compass”—all typical orchestral examples, trompe de chasse, bugle
  * A23.21 fixed length—trompe de chasse, natural horn, natural trumpet
  * A23.22 variable length—trombone, valved or keyed trumpet, valved horn
APPENDIX B: THE COMPASS OF THE DOUBLE HORN

Notes (1) The figures under each note indicate that note’s numerical sequence in the harmonic series germane to each tonality. The letters before give the type of horn, and the figures that follow show what valve or combination of valves is required to produce the harmonic series of any given tonality, ‘o’ means no valve required. The five types of horn covered are:

A) B♭/A single horn, with thumb valve for A or, when suitably tuned, to serve as a muting valve: in the latter case fingerings that include A will be discounted. See (a) below.

B) Single F horn, standard system; three valves.

C) Single F horn, French ascending system; three valves. The third valve raises the pitch one tone, so a G crook has to be used.

D) F/B♭ double horn, standard system, with thumb valve T that puts it in B♭. This valve is sometimes reversed, putting a B♭ horn into F; in this case the table must be altered by placing T before the F fingering.

E) F/B♭ double horn, French system: the third valve raises the pitch one tone on both sections.

(a) When the thumb valve T is tuned flat for muting, the combinations 1 + 3 + 5 and 3 + 4 + 5 may be expected to give better intonation than 1 + 3 + 5 and 3 + 4 + 5. This applies equally to the double horn with five valves.

(2) The combination 1 + 3 + 5 + 7 for the B♭/A horn is not included. The four valves together, even when T is tuned for muting, do not give a tube length sufficient for the production of a satisfactory B♭ harmonic series. It can, however, be used for the pedal C of the B♭ horn, as in this case the sharpness can be corrected by relaxing the lip: the higher harmonics cannot be thus corrected.

(3) The harmonic series of B♭/basso is not available with any standard valve combination, and is included here only because this crook is often called for in works where the horn parts are written for the old natural horn. B♭ basso parts can, of course, be played on the valve horn without difficulty by transposition. Harmonics shown x tend to be flat and those shown X to be sharp according to the tempered scale.

1 From Moreley-Pegge, The French Horn, Appendix 1.
ABBREVIATIONS


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