Schoenberg, Wittgenstein, and the Vienna Circle: Epistemological Meta-Themes in Harmonic Theory, Aesthetics, and Logical Positivism

James Kenneth Wright

McGill University, Montreal

August, 2001

Submitted to the

Faculty of Graduate Studies and Research

in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

© James Kenneth Wright, 2001



National Library of Canada

Acquisitions and Bibliographic Services

395 Wellington Street Ottawa ON K1A 0N4 Canada

Bibliothèque nationale du Canada

Acquisitions et services bibliographiques

395, rue Wellington Ottawa ON K1A 0N4 Canada

Your file Votre rélérence

Our file Notre référence

The author has granted a nonexclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission. L'auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

L'auteur conserve la propriété du droit d'auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

0-612-78799-0

Canadä

Abstract

This study examines the relativistic aspects of Arnold Schoenberg's harmonic and aesthetic theories in the light of a framework of ideas presented in the early writings of Ludwig Wittgenstein, the logician, philosopher of language, and Schoenberg's contemporary and Austrian compatriot. The author has identified correspondences between the writings of Schoenberg, the early Wittgenstein (the *Tractatus Logico-Philosophicus*, in particular), and the Vienna Circle of philosophers, on a wide range of topics and themes. Issues discussed include the nature and limits of language, musical universals, theoretical conventionalism, word-to-world correspondence in language, the need for a fact- and comparison-based approach to art criticism, and the nature of music-theoretical formalism and mathematical modeling. Schoenberg and Wittgenstein are shown to have shared a vision that is remarkable for its uniformity and balance, one that points toward the reconciliation of the positivist-relativist dualism that has dominated recent discourse in music theory. Contrary to earlier accounts of Schoenberg's harmonic and aesthetic relativism, this study identifies a solid epistemological core underlying his thought, a view that was very much in step with Wittgenstein and the Vienna Circle, and thereby with the most vigorous and forward-looking stream in early twentieth century intellectual history.

Sommaire

Cette étude examine les aspects relativistes des théories harmoniques et esthétiques d'Arnold Schoenberg à la lumière d'idées présentées dans les premiers écrits du logicien autrichien et philosophe du langage Ludwig Wittgenstein, compatriote et contemporain de Schoenberg. L'auteur a établi des correspondances sur toute une gamme de sujets et de thèmes entre les écrits de Schoenberg et ceux de Wittgenstein à ses débuts (le Tractatus Logico-Philosophicus en particulier). Il discute entre autres de la nature et des limites du langage, des universaux de la musique, du conventionalisme théorique, de la correspondance « mot à monde » dans le langage, de la nécessité d'une approche de la critique artistique fondée sur les faits et la comparaison, de la nature du formalisme théorique en musique et de la modélisation mathématique. Il démontre que Schoenberg et Wittgenstein avaient une vision commune, remarquable par son uniformité et son équilibre, une vision qui annonce la réconciliation du dualisme positiviste-relativiste qui a dominé le discours récent en théorie musicale. Contrairement à des exposés précédents du relativisme harmonique et esthétique de Schoenberg, cette étude établit au cœur de sa pensée une cohérence épistémologique qui était au diapason de Wittgenstein et du Cercle de Vienne, et, de ce fait, du courant le plus éclairé et tourné vers l'avenir de l'histoire intellectuelle du vingtième siècle.

Acknowledgments

With humility and appreciation I would like to acknowledge those who have assisted me in this research. First and foremost, I wish to thank my advisor, William Caplin. It is impossible to enumerate all of the ways in which Professor Caplin has supported, encouraged, and influenced my research. Our dialogue began with the wide-ranging and engaging discussions that took place in his graduate seminar on the history of music theory, and it has continued, unabated, through all stages of the preparation of the dissertation. I have valued Professor Caplin's breadth of scholarship, his rigorously incisive critique, and his keen musical insight and judgment. It has been a pleasure and luxury to have had the opportunity to work under his expert guidance.

I have also had the good fortune of being able to discuss my work with a remarkable Wittgenstein scholar. The assistance I have received from Mathieu Marion has been invaluable to me as I have ventured into his domain. He has generously shared his expertise, commented on drafts, and patiently discussed subtle nuances of Wittgenstein's philosophy with me (concerning the foundations of mathematics, in particular). It is difficult to take full account of the many benefits I have reaped from our discussions. Among other things, I have been infected by Professor Marion's enthusiasm for all things Wittgensteinian, an "affliction" that seems likely to remain with me for a lifetime. Thanks are due also to Professor Don McLean for carefully scrutinizing the draft with his eye for detail, for insisting on the exigencies of rigor, and for generously sharing his broad expertise on mathematical modeling, Schoenberg, and the Second Vienna School.

Professor Peter Schubert was an especially helpful interlocutor during the early stages of this research. Out of our conversations I first formed my belief that a study of the conceptual foundations of Schoenberg's harmonic theory would be a timely one for our discipline. I am also grateful to Peter for discouraging me from wholly abandoning my activities as a musician in order to pursue my research goals. David Huron (Director of the Cognitive and Systematic Musicology Laboratory, University of Ohio) also helped me to formulate my research objectives. A memorable and provocative conversation with David while strolling through the campus of Cambridge University in the summer of 1997 convinced me to pursue research concerning musical universals and harmonic relativism. He is a unique model to those of us who are interested in the empirical investigation of the principles underlying music theory.

I owe a debt of deep gratitude to my friend, Sharon Moren, for her constant help and encouragement, for gamely engaging in dialogue with me at all stages of the research, and for translating some valuable Italian materials. Thanks are due also to Albert Bregman (Emeritus Professor, Department of Psychology, McGill University), Andrew Lugg (Professor of Philosophy, University of Ottawa), and to my friends Myrna Rootham, Bruno Alberton, and

v

Michael Parkes, for their support, encouragement, and advice. To my family – my parents, my sister Susan, and especially to my infinitely patient daughter Jennifer – I want to express my most heartfelt appreciation.

I am very grateful for the generous support I have received from the Social Sciences and Humanities Research Council of Canada. I wish also to express appreciation for the resources of the National Library of Canada, the Arnold Schoenberg Center (Vienna), the Vienna Circle Institute (Vienna), and the McGill University, University of Ottawa, and Carleton University libraries.

Finally, I want to acknowledge my indebtedness to the late Professor Bo Alphonce (1929-2000), my mentor and friend, for so generously sharing his profound insight and curiosity concerning all things epistemological, and for encouraging me to return to McGill to pursue doctoral research. This dissertation is dedicated to his memory.

Table Of Contents

Chapter 1: Introduction	1
Decline of the Quest for Universals in Twentieth-Century Music Theory	1
Schoenberg and Wittgenstein	5
Chapter 2: Universalism and Relativism in Schoenberg's Harmonic Theory	_ 10
Relativism in Schoenberg's Harmonic and Aesthetic Theories	12
The Problem of Universals	20
The Epistemological Foundations of Harmonic Theory: Four Propositional Categories	33
Schoenberg's Universalism: The Icarus Principle	42
Schoenberg's Relativism and Conventionalism: The Schenker/Schoenberg Controversy	53
Chapter 3: Schoenberg and Wittgenstein: Positivism and the Limits of Language	_ 62
Language and Knowledge: Analytic Philosophy and the Vienna Circle	72
Wittgenstein's Tractatus	78
Wittgenstein's "Stop": The Is/Ought Dichotomy and the Limits of Language	84
Schoenberg's "Stop": Facts versus Values in Harmonic Theory	90
The Proper Role of Art Theory and Aesthetics: Pointing to Facts and Making Comparisons	94
"Important Nonsense": Showing the Value of Values	96
Equating Ethics and Aesthetics: Emphasis on Praxis over Theory	99
Schoenberg on the Limits of Language: "O Word, Thou Word that I Lack"	103
Wittgenstein, Schoenberg, and Schopenhauer: The Art Object Sub Specie Aeternitatis	106
Rejecting "Heart and Brain" Dualism	112

 Chapter 4: Problems of Formalism
 121

 Vienna-Circle Conventionalism: The Autonomy of Language and Logic
 121

 The Autonomy of Musical Languages: Creating Worlds of Our Own Making
 130

 Radical Formalism in Twentieth-Century Harmonic Theory
 138

 Was Schoenberg a Radical Formalist?
 144

 Wittgenstein's Grundgedanke: The Autonomy of Logic and Mathematics
 146

 Music-Theoretical Formalism and the Problem of Tautology
 156

 Wittgenstein's Rejection of Set Theory: Chasing Cantor and Hilbert from Paradise
 171

 Logical and Mathematical Formalism as "Scaffolding"
 176

 The Proper Role of Mathematical Modeling: Wittgenstein's Constructivist Viewpoint
 179

 Things versus Facts and "States of Affairs": A Theory of Chords Versus a Theory of Harmony
 181

 Chapter 5: Summary and Conclusions
 189

 Bibliography
 203

viii

Chapter 1: Introduction

DECLINE OF THE QUEST FOR UNIVERSALS IN TWENTIETH-CENTURY MUSIC THEORY

Twentieth-century music theory has been characterized by the gradual erosion of a commonly-accepted epistemological framework.¹ Whereas the mainstream of eighteenth- and nineteenth-century theory was founded upon a broad base of mutual agreement concerning foundational principles, this description most assuredly does not apply to music-theoretical discourse in the twentieth century. Even a cursory review of the literature reveals that there are now nearly as many music theory epistemologies as there are music theorists. Positions range between polar extremes: from the committed solipsist-relativists, who argue in favour of a music theory that can accommodate a wide range of subjective responses to music,² to the positivist systematic-musicologists, who assert that a music theory that abandons its claim to impersonal cogency is no

¹ Epistemology is the branch of philosophy concerned with the origins, foundations, presuppositions, nature, extent, and veracity (truth, reliability, validity) of knowledge. Peter A. Angeles, *Dictionary of Philosophy* (New York: Barnes & Noble Books, 1981), s.v. "Epistemology."

² For example, see Marion Guck, "Music Loving, or the Relationship with the Musical Work," in *Music and Meaning*, ed. Jenefer Robinson (Ithaca: Cornell University Press, 1997), 201-212; Lawrence Kramer, "The Musicology of the Future," *Repercussions* 1/1 (1992): 5-18; idem., *Classical Music and Postmodern Knowledge* (Berkeley and Los Angeles: University of California Press, 1995); Rose Subotnik "Toward a Deconstruction of Structural Listening: A Critique of Schoenberg, Adorno, and Stravinsky," in *Explorations in Music, the Arts, and Ideas: Essays in Honour of Leonard B. Meyer*, ed. Eugene Narmour and Ruth A. Solie (Stuyvesant, N.Y.: Pendragon Press, 1988); Patrick McCreless, "Contemporary Music Theory and the New Musicology: An Introduction," *Music Theory Online*, 2.2 (1996); Fred Maus, "Humanism and Musical Experience" (Ph.D. Dissertation, Princeton University, 1990).

music theory at all.³ As a result, reasoned argumentation has increasingly given way to invective, *argumentum ad hominem*, and polemical sparring from logically irreconcilable positions. In the absence of consensus regarding the very foundations of music-theoretical knowledge, any kind of mutual understanding concerning discourse and methodology in music theory seems likely to remain elusive.

Any proposition of music theory is underlaid by a multitude of "riverbed propositions," foundational principles that are not generally part of the traffic of ordinary discourse but that are presupposed by it.⁴ For most of its history, the edifice of western music theory has been buttressed upon a set of such principles. They have been posited as "universals" of music. The quest for universals has preoccupied much of the history of music theory, but there has been a marked decline in universalist discourse among twentieth-century theorists. This epistemological shift has not occurred in isolation. A rejection of the very

³ For example, see Matthew Brown and Douglas Dempster, "The Scientific Image of Music Theory," *Journal of Music Theory*, 33/1 (1989): 65–106; Douglas Dempster and Matthew Brown "Evaluating Musical Analysis and Theories: Five Perspectives," *Journal of Music Theory*, 34/2 (1990): 247–79; Pieter Van den Toorn, *Music, Politics, and the Academy* (Berkeley and Los Angeles: University of California Press, 1995).

⁴ This is true of any domain of knowledge. I have borrowed the term "riverbed proposition" from Wittgenstein. See *Philosophical Investigations*, ed. G. E. M. Anscombe and R. Rhees (Oxford: Blackwell, 1953).

possibility of universals is one of the defining characteristics of postmodern thought.⁵

I first became preoccupied with the problem of universals when, in earlier research, I set out to investigate the relevance of Albert Bregman's principles of "auditory stream segregation" for music theory.⁶ Bregman's theory describes a perceptual pattern-organization process that he calls "auditory scene analysis" (ASA). ASA solves the perceptual problem of separating individual sounds that are embedded in complex acoustic mixtures (the so-called "cocktail-party problem"). It appears to be a function of the human auditory system that is both universal and largely inaccessible to conscious control.⁷

Bregman's ideas were relatively easy to communicate to composers, for whom I was able to produce convincing demonstrations of their utility. More problematic, however, was the challenge of presenting ASA to music theorists. Within the music theory community I encountered a widespread tendency to dismiss the suggestion that our experience of musical artworks might be

⁷ Albert S. Bregman, Auditory Scene Analysis: The Perceptual Organization of Sound (Cambridge: M.I.T. Press, 1991).

⁵ Jean-François Lyotard, *The Postmodern Condition: A Report on Knowledge* [La Condition *postmoderne: rapport sur le savoir,* 1979], trans. G. Bennington and B. Massumi (Minneapolis, Minn.: University of Minnesota Press, 1984), xiii.

⁶ James K. Wright and Albert S. Bregman, "Auditory Stream Segregation and the Control of Dissonance in Polyphonic Music," *Contemporary Music Review*, 2/1 (1987): 63–92; James K. Wright, "Auditory Object Perception: Counterpoint in a New Context" (M.A. Thesis, McGill University, Montreal, 1986); idem., "From Rameau's *Corps Sonore* to Bregman's *Auditory Scene:* Psychoacoustic Models for Understanding Harmonic Grouping and Interval Quality," Paper presented at the Congress of the International Musicological Society, Royal College of Music, London, August, 1997.

constrained by immutable laws of acoustics and psychoacoustics. Unlike their eighteenth- and nineteenth-century counterparts, many twentieth-century theorists appear to have concluded that the laws of acoustics and the principles of auditory perception have only a peripheral role in music-theoretical discourse.⁸

Perhaps Milton Babbitt set the tone by characterizing the debate concerning universals as "the overtone follies."⁹ Dismissing appeals to the authority of the historical progenitors of music theory, Babbitt described the "concern with ultimacy" (i.e., with universals) as "futile," "an occupational malady of theorists of music."¹⁰ By the late twentieth century Babbitt's position appeared to have become normative.¹¹ How could the foundation of our epistemology have shifted so radically? How and why has our conception of the organizational principles underlying music come to this point? How and why have current trends in music theory shifted away from the traditional quest for musical universals?

⁸ There are, of course, exceptions to the general rule that pre-twentieth-century theorists accepted the notion of musical universals. Gottfried Weber (*Versuch einer geordneten Theorie der Tonsetzkunst*, 1832), for example, vehemently opposed universalism of any kind. In chapter 2, I will discuss the traditional universalist position in more detail.

⁹ Milton Babbitt, "The Structure and Function of Music Theory," in *Perspectives on Contemporary Music Theory*, ed. Benjamin Boretz and Edward T. Cone (New York: Norton, 1972), 19.

¹⁰ Milton Babbitt, "Past and Present Concepts of the Nature and Limits of Music," in *Perspectives* on Contemporary Music Theory, ed. Benjamin Boretz and Edward T. Cone (New York: Norton, 1972), 5.

¹¹ This general impression is based only on an informal survey of the literature, conference proceedings, graduate seminar discussions, and other anecdotal evidence.

SCHOENBERG AND WITTGENSTEIN

The pursuit of answers to these questions ultimately leads to two prominent citizens of early twentieth-century Vienna: Arnold Schoenberg and Ludwig Wittgenstein. Amid the unique vortex of ideas that was Vienna during the period 1910 to 1935, Arnold Schoenberg introduced a new harmonic relativism to music theory, a position that has become normative in harmonic theory since that time. During the same quarter-century, Ludwig Wittgenstein consolidated the set of radical and visionary ideas that brought the "analytic revolution" in philosophy to fruition. I will argue that the essential themes and convictions that informed Wittgenstein's early philosophy bear a striking resemblance to those that dominate Schoenberg's writings. A close study of the correspondence between their ideas has been warranted. This dissertation aims to fulfill that goal.

Wittgenstein's *Tractatus Logico-Philosophicus* is a landmark in early twentieth-century thought.¹² Striving to reduce language to its formal logical essentials, the *Tractatus* placed the analysis of language at the centre of philosophical discourse (where it has remained), and it gave impetus to the rise of logical positivism, a movement that took shape in the writings of a group of philosophers and scientists that became known as "the Vienna Circle" (Schlick,

¹² Ludwig Wittgenstein, *Tractatus Logico-Philosophicus* [Logisch-Philosophische Abhandlung, 1921], trans. D. F. Pears and B. F. McGuinness (London: Routledge and Kegan Paul, 1961).

Carnap, Neurath, Waismann, et al.). A handful of composers have intuited the significance of Wittgenstein's *Tractatus* and have written music inspired by its intellectual rigour, by its power, and by the poetic, lyric and mystical qualities of its prose (Elizabeth Lutyens, ¹³ Toru Takemitsu,¹⁴ Laurie Anderson,¹⁵ Steve Reich,¹⁶ Donnacha Dennehy,¹⁷ for example). However the *Tractatus* remains largely unknown and unexamined by music theorists,¹⁸ just as Schoenberg's writings are not widely known among logicians and philosophers.¹⁹ Leon Botstein has commented on the lamentable paucity of commentary on Wittgenstein by music theorists. "Even a Schenker-Wittgenstein comparison, an

¹³ An a capella motet titled Excerpta Tractatus Logico-Philosophicus (Op. 27, 1952).

¹⁴ *Stanza I* (1969), inspired by an image from the *Tractatus* (proposition 6.432: "How things are in the world is a matter of complete indifference for what is higher").

¹⁵ Two songs inspired by, and dedicated to, Wittgenstein: "If You Can't Talk About it, Point to it," and "Language is a Virus from Outer Space."

¹⁶ *Proverb* (1996), a meditation on a single line of Wittgenstein: "How small a thought it takes to fill a whole life."

¹⁷ Counting (2000).

¹⁸ Jorn K. Bramann's *Wittgenstein's Tractatus and the Modern Arts* (Rochester, N.Y.: Adler Publishing, 1985) is an excellent study of the relationship between Wittgenstein's early philosophy and aesthetics in the visual arts and literature, but a discussion of music is conspicuously absent from Bramann's commentary.

¹⁹ The Italian philosopher Aldo Gargani is an important exception ("Techniques descriptives et procédures constructives," in *Ludwig Wittgenstein*, ed. Jean-Pierre Cometti, trans. [from the Italian original by] Jutta Hansen and Jacques Schmitt [Marseille: Sud-Revue Littéraire, hors série, 1986]: 74–121). Gargani describes Wittgenstein's "constructivist" position with respect to a number of questions of epistemology (see below, chapter 4), and he compares it to constructivist aspects of Schoenberg's thought. I am grateful to Mathieu Marion for directing me to this source.

obvious subject," he writes, "has yet to be undertaken."²⁰ Those theorists who have alluded to the *Tractatus* have done so in passing, and not in substance.²¹ Only Boretz and Cone have explicitly linked Schoenberg to Wittgenstein and the Vienna Circle:

In Schoenberg's theoretical quest, one can discern the spirit of what might be termed the *Bauhaus* mentality, which in turn was reflected, however hazily, in the [conceptualizations of] the Vienna Circle . . . and the writings of Schlick, Neurath, Carnap, and Wittgenstein.²²

I will attempt to demonstrate that the correspondence between Schoenberg's thought and Wittgenstein's conceptual framework is not a hazy one, as Boretz and Cone suggest. This is not to assert that the *Tractatus* explicitly addresses music theory and modernist aesthetics, or that Schoenberg was concerned about (or even familiar with) the problems of analytic philosophy and logical positivism. Wittgenstein's musical tastes were actually somewhat conservative, and Schoenberg's epistemological reflections usually lack the conceptual precision and

²⁰ Leon Botstein "Cinderella; or Music and the Human Sciences: Unfootnoted Musings from the Margins," *Current Musicology*, 53 (1993): 132.

²¹ For example, see Subotnik, "Toward a Deconstruction of Structural Listening," 87–122; John Cage, *Charles Eliot Norton Lectures I-VI* (Cambridge: Harvard University Press, 1990); Matthew Brown "Adrift on Neurath's Boat: The Case for a Naturalized Music Theory," *Music Theory Online*, 2.2 (1996); Nicholas Cook, "Music Theory and 'Good Comparison': A Viennese Perspective," *Journal of Music Theory* (Spring, 1989): 117–42; Alexander Goehr, "Schoenberg and Karl Kraus: The Idea Behind the Music," *Music Analysis*, 4, 1/2 (1985): 59–71; Judith Etzion and Susana Weich-Shahak "'Family Resemblances' and Variability in the Sephardic Romancero: A Methodological Approach to Variational Comparison," *Journal of Music Theory*, 37/2 (Fall, 1993): 267–310; Robert W. Parker, "Wittgenstein's Net and Schubert's Mass in G: Asking the Right Questions about Performance Practice," Paper presented to the Pacific Southern Chapter of the College Music Society, 1997.

²² Benjamin Boretz and Edward T. Cone, Preface to *Perspectives on Contemporary Music Theory*, ed. Benjamin Boretz and Edward T. Cone (New York: Norton, 1972), viii-ix.

sophistication required of modern philosophers. Furthermore, it appears that neither Schoenberg nor Wittgenstein was aware that a parallel revolution was underway in a sister discipline virtually in their own backyard. Nonetheless, I will argue that many of Schoenberg's most central ideas concerning music theory and aesthetics correspond closely to those at the core of Wittgenstein's thought with respect to logic, language, science, ethics, metaphysics, values, and the structure of reality.

In chapter 2, I will provide some general philosophical background on "the problem of universals," and I will establish a framework for the ensuing discussion by aligning historical postulates of music theory into four general propositional categories. I will then examine Schoenberg's harmonic and aesthetic theories, focusing in particular on their relativistic aspects. I will argue that Schoenberg espouses an epistemological relativism concerning *values* in aesthetics and harmonic theory, rather than a thoroughgoing relativism that denies or ignores the existence and importance of the universals of physics, psychophysics, and cognition. In chapter 3, I will introduce the early philosophy of Ludwig Wittgenstein and examine numerous points of intersection between the positions adopted by Schoenberg and the early Wittgenstein. In chapter 4, I will employ the conceptual apparatus provided by Wittgenstein and the Vienna Circle to address some of the problems inherent in music-theoretical formalism. I will also consider some of the implications of these ideas for music theory in the latter half of the twentieth century. In particular, I will apply Wittgenstein's

8

views concerning the foundations of mathematics to mathematical modeling in music analysis, a field of research in which Schoenberg is generally cited as an inspiration and point of departure.

For some musicologists, this dissertation may be an entry point to Wittgenstein's ideas and to Wittgenstein studies in general. For philosophers (logicians in particular), it will introduce some of the problematic concepts in twentieth-century music aesthetics, formalism, and mathematical modeling, and suggest some analogies to philosophical and linguistic concepts. For music scholars, it situates Schoenberg's epistemology within the broader conceptual revolution that was unfolding among his Viennese contemporaries, thereby identifying common sources of influence and debunking many myths and halftruths that have gained currency about Schoenberg's epistemology. By aligning Schoenberg with Wittgenstein, we gain a more accurate understanding of his proper place within the general sweep of the history of ideas. For all readers, this exegesis is the first attempt to take a comprehensive and synoptic view of the common themes found in the writings of Schoenberg and the early Wittgenstein.

9

Chapter 2: Universalism and Relativism in Schoenberg's Harmonic Theory

An all-pervasive harmonic relativism – the notion that the composer alone is the supreme author of tonal laws and the concomitant dismissal of the traditional quest for harmonic universals – has often been identified as the most revolutionary aspect of Schoenberg's theory and aesthetic. Karl Popper, one of the twentieth century's leading gurus of scientific epistemology, opposed Schoenberg's artistic vision and theory chiefly because of what he conceived to be its irrational, relativistic nature.²³ Musicologist William Thomson gives a similar account of Schoenberg's position:

The `make up the rules as we go view' has its unique temptations. It follows from a relativism that is rich in fantasizing potentials. It allows me to believe that my version of a tonal Euclid is as worthy as yours, so long as it is internally consistent, and that it need possess with your equally-valid version no common inductive basis, no shared deductive process.²⁴

²⁴ William Thomson, *Schoenberg's Error* (Philadelphia: University of Pennsylvania Press, 1991), 118. Thomson is one of a growing community of scholars who have recently argued that Schoenberg's innovations (especially the twelve-tone method) established an epistemologically-illegitimate course for musical modernism. Other critics who have adopted a similar position include Joseph P. Swain (*Musical Languages* [New York: Norton, 1997], 119–40) and Martin Vogel (*Schönberg und die Folgen: Die Irrwege der Neuen Musik* [Bonn: Verlag fuer systematische Musikwissenschaft, 1987]). Thomson's oblique reference to Euclidean geometry is perhaps a

²³ Karl Popper, *Unended Quest: An Intellectual Autobiography* (London: Fontana, 1976), 53-72; idem., *The Myth of the Framework* (London: Routledge, 1994), 18. The importance of music in Popper's thought has been generally overlooked both by scientists and musicologists. Jamie Kassler summarizes Popper's extensive background in music: "It is not widely known that for a time Popper was a student of music. First he studied musical composition with Erwin Stein, a pupil of Schoenberg, then he became a student of church music at the conservatory in Vienna, finally he chose history of music as a second subject for his doctoral examination at the University of Vienna" ("Apollo and Dionysos: Music Theory and the Western Tradition of Epistemology," in *Music and Civilization: Essays in Honor of Paul Henry Lang*, ed. Edmond Strainchamps, Maria R. Maniates, and Christopher Hatch [New York: Norton, 1984], 461).

Thomson's tone is clearly polemical, but no more so than Schoenberg's own irascible defense of his conception of harmony and tonality.²⁵ By abandoning tonality and replacing it with a new system of his own making, Schoenberg secured a unique place in the history of music. His conception of harmony is the fundamental cause for which Schoenberg has been alternately canonized (as "a God and hero")²⁶ and damned (as "the Satan of modern music")²⁷ by both scholars and the listening public. Questions concerning harmonic universals are at the heart of the matter. Do they exist? Even if they do, must they necessarily play a role in the composer's conceptual framework? Is it necessary for composers to accommodate universals among their theoretical. precepts? Are Thompson and Popper justified in describing Schoenberg as a relativist? Polemics have clouded our understanding of the nature of Schoenberg's harmonic relativism, obscuring the essential epistemological issues at stake. A closer examination of the epistemological underpinnings of Schoenberg's harmonic and aesthetic theories has been clearly needed.

²⁷ Schoenberg, "How One Becomes Lonely [1937]," in *Style and Idea*, 42.

thinly veiled allusion to the problems inherent in the mathematical-modeling approach to music theory (discussed in chapter 4).

²⁵ See, for example, Schoenberg, "Problems of Harmony [1934]," in *Style and Idea: Selected Writings*, ed. Leonard Stein (London: Faber & Faber, 1975), 268–87; idem., *Theory of Harmony [Harmonielehre*, 1911], trans. Roy E. Carter (Berkeley and Los Angeles: University of California Press, 1978), 7-12.

²⁶ Michael Ullman, "Saint Ursala (Ursala Oppens: a Composer's Pianist)," *Atlantic Monthly*, 281/5 (May, 1998), 113.

RELATIVISM IN SCHOENBERG'S HARMONIC AND AESTHETIC THEORIES

In general, only the components of Schoenberg's writings that allegedly embrace "relativistic" ideas about harmony and aesthetics will be examined in this dissertation. At the outset I will therefore set aside Schoenberg's less controversial and non-relativistic theoretical writings. For example, he indisputably acknowledged the sovereignty of universals concerning various non-harmonic aspects of the traditional "formal" domain of music theory. I am referring here to a variety of Schoenbergian concepts that embody ideas about "comprehensibility" in the expression of musical ideas: his unique conception of "the musical idea,"²⁸ of "developing variations,"²⁹ of traditional "phrase structure,"³⁰ and aspects of his twelve-tone method that can be viewed as an extension of traditional thematicism, for example. In many respects, these concepts are essentially a nod in the direction of universals of memory and

²⁸ Arnold Schoenberg, *The Musical Idea and the Logic, Technique, and Art of Its Presentation* [*Musicalische Gedanke und die Logik, Technik, und Kunst seiner Darstellung,* 1923-36], ed. and trans. Patricia Carpenter and Severine Neff (New York: Columbia University Press, 1995). Schoenberg stated that his goal in composition was to present a single complete thought or "musical idea," and to relate everything in a composition to this one idea (ibid., xv). He sometimes ascribes an almost transcendental quality to "the musical idea," but it is not a fundamentally relativistic idea.

²⁹ Ethan Haimo, "Developing Variations and Schoenberg's Serial Music," Music Analysis, 16/3 (October, 1997): 349-65; Jack Boss, "Schoenberg's Opus 22 Radio Talk and Developing Variations in Atonal Music," Music Theory Spectrum," 14/2 (1992): 125–49; Walter Frisch, "Brahms, Developing Variation, and the Schoenberg Critical Tradition," Nineteenth-Century Music, 5/3 (1982): 215–32.

³⁰ Arnold Schoenberg, *Fundamentals of Musical Composition*, ed. Gerald Strang and Leonard Stein (London: Faber & Faber, 1967); idem., *Structural Functions of Harmony*, ed. Leonard Stein (New York: Norton, 1969); idem., *Coherence, Counterpoint, Instrumentation, Instruction in Form* [*Zusammenhang, Kontrapunkt, Instrumentation, Formenlehre*, 1917-36], by Arnold Schoenberg, ed. Severine Neff, trans. Charlotte M. Cross (Lincoln: University of Nebraska Press, 1994).

cognition.³¹ They have consequently never been as controversial, nor as subject to the charge of relativism, as Schoenberg's harmonic and aesthetic theories. Further, the entire body of Schoenberg's writings that solely addresses traditional harmonic tonality will also be withdrawn from our discussion. His conception of the "tonal problem,"³² "tonal regions" (and modulation within "monotonality"),³³ the nineteenth-century expansion of chromaticism and the dissolution of tonality by means of "vagrant chords,"³⁴ are all of immense importance in themselves. They are landmark contributions to the history of theory and form, but they are uniquely concerned with aspects of the tonal

³³ Structural Functions of Harmony, 15-29.

³⁴ Theory of Harmony, 238-67; Structural Functions of Harmony, 44-50.

³¹ In this respect Schoenberg has often been described as a relative "conservative" concerning formal procedures. See, for example, Martha Hyde, "Neo-Classic and Anachronistic Impulses in Twentieth-Century Music," *Music Theory Spectrum*, 18 (1996): 200–35; idem., "Musical Form and the Development of Schoenberg's Twelve-Tone Method," *Journal of Music Theory*, 29/1 (Spring, 1985): 85-143. This may also explain why Schoenberg never found the notion of multi-serial procedures congenial, since they were more or less consciously inaugurated with the purpose of abandoning the traditional "theme and development" approach to musical form. Schoenberg's attitude toward formal innovation seems to have been similar to that of Adolf Loos. "New forms? How dull!" Loos wrote, "It is the new spirit that matters. Even out of old forms it will fashion what we new men need" (cited in Paul Engelmann, *Letters from Ludwig Wittgenstein, with a Memoir*, ed. B. F. McGuinness [Oxford: Blackwell, 1969], 128).

³² Schoenberg describes his conception of the "tonal problem" as follows: "Every tone which is added to a beginning tone makes the meaning of that tone doubtful . . . In this manner there is produced a state of unrest, of imbalance which grows throughout most of the piece, and is enforced further by similar functions of the rhythm" (*Style and Idea*, 123). "Every tonal progression, every progression of even two tones, raises a problem which requires a special solution. Yet the further such tones are brought into relations and contract with each other and with rhythm, the greater is the number of possible solutions to the problem, and the more complex are the demands made on the carrying out of the musical idea" (*Style and Idea*, 269). See also Murray Dineen, "Problems of Tonality: Schoenberg and the Concept of Tonal Expression" (Ph.D. Dissertation, Columbia University, 1988); Fred Maus, "Music as Drama," in *Music and Meaning*, ed. Jenefer Robinson (Ithaca: Cornell University Press, 1997), 105–60).

language that are particular to the eighteenth- and nineteenth-centuries.³⁵ They do not raise fundamental epistemological problems.

We are left, then, with the body of Schoenberg's theoretical work that contains his most relativistic and controversial views concerning harmony and aesthetics. These ideas are chiefly presented in the *Harmonielehre* and in a number of the essays published in *Style and Idea*. In this corner of Schoenberg's theory, he adopts the broadest possible conception of tonality and harmony. The notion of harmony is extended to embrace virtually any conceivable set of vertical relationships, such that we can speak not only of a tonal, but of an atonal, and twelve-tone, "harmony."³⁶ This broad definition of harmony required Schoenberg to introduce a number of radical innovations to music-theoretical discourse.

Let us begin with a brief synoptic overview of some of the relativistic themes presented in Schoenberg's harmonic theory. My review will be cursory and general, covering material that will be familiar to most music scholars. Other, larger, aesthetic and epistemological issues will be addressed in the remainder of this chapter, and in subsequent chapters.

³⁵ The primary sources to consult concerning this aspect of Schoenberg's theory are *Theory of Harmony, Fundamental of Musical Composition, The Musical Idea, Structural Functions of Harmony, Fundamentals of Musical Composition, Structural Functions of Harmony.* Numerous excellent discussions of Schoenberg's tonal theory are available in the scholarly literature.

³⁶ For example, see *Theory of Harmony*, 13, 311, 309; *Style and Idea*, 280.

Emancipation of the dissonance. Schoenberg's introduction of the idea of "the emancipation of the dissonance" was arguably his most important theoretical innovation. Perhaps it is more accurate to state that Schoenberg *described* rather than *introduced* this concept, since the employment of "emancipated dissonance" was well established in compositional practice by the time *Harmonielehre* was published in 1911. Under the umbrella of this single idea, Schoenberg launched four related prongs of attack on the conventional conception of dissonance:

I. Equal Status for Consonance and Dissonance

Schoenberg enunciated a radically new and relativistic conception of dissonance by denying the need to subject it to systematic aesthetic constraints. He dismisses any discussion of the relative "beauty" of consonance and dissonance. "The question of whether dissonances or consonances should be used," Schoenberg writes, "is not a question of beauty."³⁷ "Beauty, an undefined concept, is quite useless as a basis for aesthetic discrimination."³⁸ Schoenberg offers "a unified perception of all thinkable connections of notes (i.e., combinations of notes sounded together); they only differ from one another in a *gradated* manner, and thus make it superfluous to divide them into separate classes, as consonances or dissonances.... Emancipation means the guaranteeing of equal rights and equal

³⁷ "New Music: My Music [1930]," in *Style and Idea*, 101.

³⁸ Structural Functions of Harmony, 195.

entitlements."³⁹ For Schoenberg, the suppression and control of dissonance that had characterized earlier theory was no longer a universal requirement of harmonic organization: "The term *emancipation of the dissonance* refers to its comprehensibility, which is considered equivalent to the consonance's comprehensibility."⁴⁰

II. Compositional Exploration of the More Remote Overtones

"Dissonances," Schoenberg insists, "are merely more remote consonances in the

series of overtones."41 His student, Joseph Rufer, summarizes this view: "There

are only consonances now; dissonances are merely more remote consonances.

The whole matter is relative."42 Schoenberg established this viewpoint in the

opening chapters of Harmonielehre:

In the overtone series . . . there appear after some stronger-sounding overtones a number of weaker-sounding ones. Without a doubt the former are more familiar to the ear, while the latter, hardly perceptible, are rather strange. . . . The more remote overtones are recorded by the subconscious, and when they ascend into the conscious they are analyzed and their relation to the total sound is determined. But this relation is as follows: the more immediate overtones contribute more, the more remote overtones less. Hence the distinction between them is only a matter of degree, not of kind. They are no more opposites than two and ten are opposites, as the frequency numbers indeed show; and the expressions 'consonance' and 'dissonance', which signify an antithesis, are false. It all simply depends on the growing ability of the analyzing ear to familiarize itself with the remote overtones, thereby expanding the conception of what is euphonious, suitable for art, so that it embraces the whole natural phenomenon.

³⁹ Josef Rufer, *Composition with Twelve Tones* [*Die Komposition mit Zwölf Tönen*, 1952], trans. Humphrey Searle (New York: MacMillan, 1954), 50–51.

⁴⁰ "Composition with Twelve Tones I [1941]," in Style and Idea, 217.

⁴¹ Structural Functions of Harmony, 193.

⁴² Rufer, Composition with Twelve Tones, 51.

... The evolution of music has followed this course: it has drawn into the stock of artistic resources more and more of the harmonic possibilities inherent in the tone."⁴³

III. New Conceptions of Chord Building: Liberation of Dissonance from Obligatory Resolution to Consonance

Schoenberg proposed that "the chord-building capacity of dissonances does not depend on possibilities of, or tendencies toward, resolution."⁴⁴ For this reason, he denied the universality of the traditional conception of "non-harmonic tones," since it depends upon the subordination of dissonance to consonance. The status of non-harmonic tones was the central issue in dispute in the Schenker-Schoenberg controversy (discussed in more detail below).⁴⁵

IV. New Conceptions of Chord Progression

Just as Schoenberg felt that it was no longer necessary to subordinate dissonances to consonances, he insisted that it was no longer necessary to subordinate chord tones to their harmonic roots. That is, the habitual and traditional reference to chord-roots and root-progressions need not be understood as a universal requirement of harmony and compositional technique.⁴⁶ Schoenberg introduced

⁴³ *Theory of Harmony*, 20-21. Schoenberg's somewhat Freudian vocabulary – then very much in currency and vogue in Vienna – is noteworthy in the opening sentences of this quotation. For corroborative passages concerning dissonances as "the more remote overtones" of the harmonic series, cf. *Theory of Harmony*, 316-18 and *Style and Idea*, 87, 260-61, 271-72, 328-29, 312.

⁴⁴ Theory of Harmony, 419. See also Style and Idea, 280.

⁴⁵ Kip Montgomery, "Schenker and Schoenberg on Harmonic Tonality," *Indiana Theory Review*, 15/1 (Fall, 1994): 53–68.

⁴⁶ For example, see *Theory of Harmony*, 330; *Style and Idea*, 218.

a variety of new ways to conceptualize chord progressions. For example, he introduced the principle of complementation: "It seems that the progression of chords can be justified by the chromatic scale, . . . [by] the tendency to include in the second chord tones that were missing in the first."⁴⁷ He also introduced the possibility of serially-generated chord progressions: "Such progressions do not derive from roots; they are vertical projections of the basic set, or parts of it, and their combination is justified by its logic."⁴⁸

Coherence Without Pitch-Centrality. Like Schenker, Schoenberg was preoccupied with the relationship between tonal language and musical unity and coherence.⁴⁹ Unlike Schenker, however, Schoenberg concluded that coherent systems of harmony could be devised by implementing structural principles unrelated to those presented within traditional conceptions of harmonic tonality. In Schoenberg's view, tonality's characteristic reference of all harmonic phenomena to a single pitch centre is not a universal requirement for musical coherence. He asserts that in twelve-tone technique, for example, the sovereignty

⁴⁸ Structural Functions of Harmony, 194.

⁴⁹ Montgomery, "Schenker and Schoenberg," 53.

⁴⁷ Theory of Harmony, 420. Schoenberg cites the fourth-last measure of Berg's song "Warm die Lufte" (Vier Lieder, Op. 2, No. 4) as an example. Bryan Simms states that "the compositional juxtaposition of complementary sets is especially prominent in atonal music by composers such as Hauer, Golyscheff, Eimart, and Roslavetz, and complementary sets are also commonly found in close proximity in the atonal music of Schoenberg composed just before his embarking on the twelve-tone method" ("The Theory of Pitch-Class Sets," Early Twentieth-Century Music, Jonathan Dunsby, ed. [Oxford: Blackwell, 1993], 120).

of the series provides for harmonic (and motivic) coherence, while at the same time liberating the composer and listener from the normative gestures and strictures of harmonic tonality.⁵⁰

Theory or "System of Presentation"? The first chapter of Schoenberg's *Harmonielehre* is titled "Theory or System of Presentation?"⁵¹ Throughout the chapter he emphasizes the idea that harmonic theories are no more than conventions or "ways of speaking" about harmonic phenomena. According to this view, the idea that we can establish a universal theory of music is therefore an illusory one. Similarly, the history of harmonic style must be viewed as nothing more than an account of the ways in which various possible compositional choices and avenues have been explored; i.e., it is a history of invented *systems* of composition rather than one of evolution toward the "discovery" of an inevitable and ever-latent diatonic tonality.⁵² Likewise, the history of music theory must be viewed as a history of *systems* for describing music (Schoenberg employs the word *Darstellung*, literally "system of presentation"). He insists that no historical system of style, and no theoretical

⁵⁰ "My Evolution [1949]," in *Style and Idea*, 87.

⁵¹ Theory of Harmony, 7–12.

⁵² This was the view promulgated by Hugo Riemann, for example. Consequently it is one of the reasons why Schoenberg had such little regard for "Riemann's kind of nonsense" (*Style and Idea,* 347). See Hugo Riemann, *Theory of Harmony and History of Music Theory, Book III [Geschichte der Musiktheorie in IX.-XIX. Jahrhundert,* 1898], trans. William Mickelson (Lincoln: University of

system of description, is universal and has priority. No theory can promise to reveal eternal truths. I will examine this viewpoint in more detail in chapters 3 and 4.

Perceptive-power. Schoenberg believed in the cultivation and improvement of "perceptive power" (*Anschauungskraft*), and he considered the laws of perception and cognition to be more malleable than those of acoustics.⁵³ Schoenberg emphasized a participatory conception of listening, and he often alluded to the possibility of compositional devices having "an effect [only] on more experienced and trained listeners."⁵⁴ He also believed that general aural acuity and listening strategies can evolve over history, in a variety of ways, according to the music to which audiences are exposed.⁵⁵

THE PROBLEM OF UNIVERSALS

Prior to the expression of these relativistic ideas by Schoenberg, theorists had generally erected their conceptions of harmony upon a foundation of harmonic *universals*. Schenker and Riemann were perhaps the strongest

Nebraska Press, 1977); Carl Dahlhaus, *Studies on the Origin of Harmonic Tonality*, trans. Robert O. Gjerdingen (Princeton: Princeton University Press, 1990).

⁵³ Theory of Harmony, 325.

⁵⁴ Coherence, Counterpoint, Instrumentation, Instruction in Form, 9.

⁵⁵ *Theory of Harmony,* 325. See also *Style and Idea,* 264, 274, 279, 285.

advocates of the brand of harmonic universalism that prevailed at the turn of the century. Riemann proposed that the quest for universals is the central pursuit of "foundational research" (*Grundlageforschung*) in musicology, and he identified the following primary goals for music theory:

... to investigate the natural laws which rule the creation of our art, and to present them in a system of logically coherent rules.⁵⁶

... to uncover the basic laws common to all ages, which govern all perceptions and forms of artistic expression ... to coordinate the advances in musical composition with the most recent discoveries in acoustics and the physiology of the ear.⁵⁷

Before examining the tenets of harmonic universalism in more detail, let us first review the history of universalism and relativism in general.

Universalism: Two Kinds of Universals. An important issue concerning terminology must be clarified at the outset. The word *universal* has been employed by philosophers in two distinctly different ways. One usage pertains chiefly to language. It refers to a philosophical distinction between the idealized conception of things as embodied in the "universal" *general-terms* of language and their instantiations in the *particulars* found in the world around us. The word *horse,* for example is a linguistic universal. It refers to an idealized constellation of

"essences," sine qua non which constitute our abstract conception of a quadrapedal

⁵⁶ Riemann, Theory of Harmony and History of Music Theory, 185.

⁵⁷ The New Grove Dictionary of Music and Musicians, s.v. "Riemann, Hugo," 16:4. Author Mark Hoffman quotes Riemann here without citing a source.

animal with a mane, etc. Only some attributes of any *particular* horse, however, conform to this ideal. The complex relationship between the universals of language and the particulars of the world has been a central concern for philosophers from Plato to Wittgenstein.⁵⁸

The other usage of the word *universal* – the one with which I will be more centrally concerned – refers to any over-arching governing principle, in any domain of knowledge, that claims the status of immutable law due to its supposed stability and generalizability. It has been claimed, for example, that the law of gravitation is a universal of physics, that Euclid's axioms are universals of space and geometry,⁵⁹ that the altruistic *golden rule* (Kant's "categorical imperative") is a universal of ethics and morality, that the association of the colour red with emotional arousal or alarm is a universal of colour-psychology, that the *sonance* (consonance/dissonance) hierarchy is a universal of music theory. Laws such as these are posited as *neutral standards* of reality, knowledge, and experience. It is precisely this notion of neutral standards to which the relativist objects.

Relativism: Homo Mensura. The earliest known formulation of philosophical relativism is generally attributed to a group of itinerant teachers who traveled

⁵⁸ Farhang Zabeeh, *Universals: A New Look at an Old Problem* (The Hague: Martinus Nijhoff, 1966); Sigfrid Fretlöh, *Relativismus versus Universalismus* (Aachen: Alano-Verlag, 1989); Harvey Siegel, *Relativism Refuted* (Dordrecht, Holland: Reidel, 1987).

⁵⁹ See Carl G. Hempel, "Geometry and Empirical Science," in *Our Mathematical Heritage: Essays on the Nature and Cultural Significance of Mathematics*, ed. W. L. Schaaf (New York: Collier, 1963), 115–32.

throughout Greece in the fifth-century B.C. The Sophists refused to accept the possibility of absolute standards of knowledge. They rejected the idea of an ultimate, stable, and unchanging reality, truth, and value. Protagorus of Abdera (c. 481-411 B.C.) stated the case simply and definitively: "Man is the measure of all things" (a position now known as the *homo mensura* tenet).⁶⁰ Later philosophers interpreted this statement to mean that all rules, principles, and knowledge are contrivances of the human mind. Even before Protagorus, Heraclitus of Ephesus (c. 544-483 B.C.) had espoused a form of relativism that has been called the "theory of flux." According to Heraclitus, change is the fundamental and natural condition of the universe, and thus absolutes, universals, and the "synchronic perspective," are illusory and do not exist. Schoenberg cites Heraclitus concerning the necessity of development in music, both that of the elements of form in a given piece of music, and of musical language itself over the course of history.⁶¹

The questions first framed by the Sophists would become the most central ones in epistemology. The relativism that characterizes the postmodern outlook

⁶⁰ See the writings of Protagorus in Hermann Diels, Ancilla to the Pre-Socratic Philosophers: A Complete Translation of the Fragments in Diels' Fragmente der Vorsokratiker, trans. Kathleen Freeman (Oxford: Blackwell, 1948).

⁶¹ "Heraclitus called change 'the principle of development.' Musical thinking is subject to the same dialectic as all other thinking" (*Fundamentals of Musical Composition*, 94).

is only the most recent chapter in this continuing debate.⁶² Indeed it is possible to describe many of the most important developments in the history of ideas in terms of an ongoing discussion concerning the merits of various forms of philosophical relativism and universalism.⁶³

Realism and Idealism. All problems of the theory of knowledge concern the nature of the relationship between thought and reality. Most philosophers concur with Coleridge's assertion that "all knowledge rests on the coincidence of an object [the known] with a subject [the knower]."⁶⁴ However, if it has been generally agreed that subject and object are united in the act of knowing, the question of which one has priority has been much more difficult to resolve. Are we to start with the object and try to introduce the subject to it, or vice-versa? Herein lies the essential distinction between realism and idealism.

The realist takes objective *external reality* as prior and tries to introduce the notion of thought or mind to it. Realism posits that knowledge and reality exist independent of the mind; i.e., that the truth 'is out there' in some sense. Indeed, for the realist, the world with which we interact by means of our senses is all that is "knowable" at all. "It is simply impossible to think that any reality depends

⁶⁴ Samuel T. Coleridge, *Biographia Literaria* (London: Dent, 1906), 136.

⁶² Stephen Best and Douglas Kellner, *Postmodern Theory: Critical Interrogations* (New York: Guilford Press, 1991).

⁶³ Zabeeh, Universals: A New Look at an Old Problem; Fretlöh, Relativismus versus Universalismus; Siegel, Relativism Refuted.

upon our knowledge of it, or upon any knowledge of it," writes one defender of the realist outlook. "If there is to be knowledge, there must first be something to be known."⁶⁵

The idealist, on the other hand, takes *thought* as prior and tries to generate our conception of reality from it. For the idealist, "reality" as we perceive it is largely or wholly a projection of the properties of the mind, and the notion that we can aspire to know an objective reality is thus illusory. Idealism must not, however, be fully equated with a purely subjective or relativistic conception of reality. Immanuel Kant and the German idealists posited that reality is structured by the mind according to a set of principles of ideation which, themselves, are universal.⁶⁶ Kant affirmed that a world indeed exists beyond the limits of the mind and perception: he called it the "noumena." But Kant's major contribution to philosophy – his "Copernican Revolution" – was the insight that the mind brings something to the objects it experiences, rigidly imposing its way of "knowing" upon them. It is the object that conforms to the mind, not the mind to the object. For Kant, the noumenal "thing in itself" ("Ding an sich") – abstractly conceived and supposed to exist independent of the intermediary agency of the *a priori* ideas of the mind, perception and cognition – is unknowable.

⁶⁵ John C. Wilson, *Statement and Inference*, Vol. 2 (Oxford: Clarendon, 1926), 777.

⁶⁶ Immanuel Kant, *Critique of Pure Reason* [*Kritik der reinen Vernunft*, 1781], trans. Paul Geyer (Cambridge: University Press, 1998).

We will see that Schoenberg conceives of the teachable principles and facts of music theory in two distinctly Kantian categories: "laws of sound" (which Schoenberg also calls "the demands of the material [or object]") and laws of cognition (which he calls "the demands of the subject"):

Let the pupil learn [that] . . . order is demanded by the subject, not the object.⁶⁷

Tonality's origin is found – and rightly so – in the laws of sound. But there are other laws that music obeys, in addition to these . . . namely, those governing the working of our minds.⁶⁸

"In the *Harmonielehre*," Carpenter and Neff have noted, "Schoenberg sketched the foundation for a theory of art, based on this concinnity between inner and outer nature."⁶⁹

Universalism and Positivism: The Synthetic/Analytic Distinction.

Postmodern critics have correctly observed that the history of music theory has been overwhelmingly dominated by a positivist epistemology.⁷⁰ The nineteenthand twentieth-century theorists who have posited harmonic universals have been unapologetic positivists. We must therefore understand the framework and

⁶⁷ *Theory of Harmony*, 29. See also Patricia Carpenter and Severine Neff, Commentary on *The Musical Idea*, by Arnold Schoenberg, ed. and trans. Patricia Carpenter and Severine Neff (New York: Columbia University Press, 1995), 10–11.

⁶⁸ "Opinion or Insight [1926]," in Style and Idea, 259.

⁶⁹ Carpenter and Neff, Commentary on *The Musical Idea*, 11.

⁷⁰ Joseph Kerman, *Contemplating Music* (Cambridge: Harvard University Press, 1985); idem., *Musicology* (London: Fontana, 1985).

categories of knowledge prescribed by positivism in order to fully appreciate their claims.

Auguste Comte first used the word *positivism* to describe an epistemology rooted in the rational empiricism of the Enlightenment.⁷¹ For Comte, as for the empiricists of the eighteenth century (Locke, Hume, et al.), knowledge of the world is attained through the systematic description of sensory experience.⁷² It was believed that this kind to knowledge would supply us with the *positive* certainty that we associate with science. Positivism is thus vehemently antimetaphysical.⁷³ The *logical positivists* of the twentieth century are descended from the movement inspired by Comte and later scientific empiricists such as Heinrich Hertz, Ernst Mach, and Ludwig Boltzmann. Although their elaborate formulations of positivists agreed with their nineteenth-century predecessors insofar as they ascribed to the view that the acquisition of reliable knowledge

⁷¹ Augute Comte, *The Positive Philosophy* [*Cours de philosophie positive*, 6 vols., 1830-42], trans. Harriet Martineau (New York: Calvin Blanchard, 1855).

⁷² The doctrine of scientific empiricism (of Bacon, Locke, Berkeley, and Hume) is founded upon the maxim"*nihil est in intellectu quod non prius fuerit in sensu*" (nothing is intelligible which is not first seized by the senses), which originates with Aristotle. Comte was also strongly influenced by the enlightenment encyclopedists, especially Diderot and d'Alembert.

⁷³ I am here employing Carnap's definition of metaphysics: "This term is used, as usually in Europe, for the field of alleged knowledge of the essence of things which transcends the realm of empirically founded, inductive science. Metaphysics in this sense includes systems like those of Fichte, Schelling, Hegel, Bergson, and Heidegger" (Rudolf Carnap, "The Elimination of Metaphysics Through Logical Analysis of Language," in *Logical Positivism*, ed. A. J. Ayer [New York: The Free Press, 1959], 80).
rests not only upon empirical investigation, but upon adherence to rigorous logic, the application of hypothetico-deductive reasoning, and the principle of verifiability ("falsifiability" for the logical positivists).⁷⁴ Accordingly, the positivists considered claims to knowledge which fail these tests (those based upon belief, for example) illegitimate, since they cannot reliably bridge the gulf of intersubjective verification and solipsism.

All questions must be answerable, theoretically at least. Unanswerable questions are not, on this view, legitimate questions at all.⁷⁵ (We will return to a more thorough discussion of logical positivism in chapters 3 and 4.)

Immanuel Kant proposed another epistemological distinction which became central to the positivist outlook. Kant separated *analytic propositions* from *synthetic propositions* in logic. For our purposes, we will define these terms as they were understood by nineteenth- and twentieth-century positivists, who

⁷⁴ In chapter 4, I will discuss Wittgenstein's formulation of the notion of falsifiability, according to which all legitimate claims to scientific knowledge must be based upon their theoretical "falsifiability" rather than the illusive notion of "verification." Catherine Kintzler has pointed out that the enlightenment philosopher Jean le Rond d'Alembert had clearly stated the requirement that hypotheses be theoretically falsifiable in *Éléments de philosophie* (Catherine Kintzler, *Jean-Philippe Rameau: Splendeur et naufrage de l'esthétique du plaisir à l'âge classique* [Paris: Sycomore], 206). The concepts of "falsifiability" and "hypothetico-deductive reasoning" are often associated with the writings of Karl Popper, where they receive extensive treatment. Karl R. Popper, *The Logic of Scientific Discovery* (*Logik der Forschung, 1934*) (New York: Basic Books, 1959); idem., "Scientific Theory and Falsifiability: A Personal Reflection on the Philosophy of Science," in *The British in Mid-Century*, ed. C. A. Mace (London: George Allen, 1957), 155-91.

⁷⁵ Erich Heller, "Ludwig Wittgenstein Symposium (I): Assessments of the Man and the Philosopher," *The Listener*, 63 (January 28, 1960): 163.

somewhat reformulated Kant's original idea.⁷⁶ Analytic propositions, which include all mathematical propositions, are inherently true, but they do not tell us anything about the empirical world. They only reveal connections *within* a given mathematical, linguistic, or logical system of symbols and rules.⁷⁷ We need only follow the process of reasoning from the definitions of the terms and the relations between them, to arrive at a conclusion about their truth. The truth of such a simple arithmetical proposition as "2+2=4," for example, is "necessary," universal, *a priori*, and analytic because of the very meaning of "2," "+," "=," and "4." Empirical evidence based on sensory experience is not required since analytical propositions contain no factual content. Their logic is a necessary or *a priori* logic, one that is prior to experience.⁷⁸ Further, since they are simply demonstrations of deductive within-system reasoning and their truth or

⁷⁶ It should be noted that some twentieth-century philosophers (most notably Quine) have questioned the legitimacy of the synthetic-analytic distinction as it was formulated by the positivists (see Willard van Orman Quine, "Two Dogmas of Empiricism," *The Philosophical Review* 60 [1951]: 20–43; reprinted in W. V. O. Quine, *From a Logical Point of View* [Cambridge Mass.: Harvard University Press, 1953]). Gary Ebbs has responded to Quine's objections with a strong defense of the analytic-synthetic distinction (*Rule-Following and Realism* [Cambridge Mass.: Harvard University Press, 1997], 95–172).

⁷⁷ Kant's contemporaries Hume and Leibniz ruminated about similar issues in logic and epistemology, but Kant's analytic-synthetic distinction is the one philosophers generally cite as the classic and original statement of the idea (Jennifer Trusted, *The Logic of Scientific Inference* [London: MacMillan, 1979], 47–69). It was the nineteenth- and twentieth-century positivists who first included mathematical propositions in the category of "analytic" propositions. Kant, Leibniz, and Mill considered the propositions of mathematics to be *synthetic* in nature (testable against the world and experience).

⁷⁸ They are therefore sometimes called "analytic *a priori* propositions" or "necessary propositions" (i.e., characterized by the impossibility of being false). See Gordon Baker, *Wittgenstein, Frege and the Vienna Circle* (Oxford: Blackwell, 1988), 209. It should be noted that at least one philosopher has defended the unorthodox notion of the analytic *a posteriori* (Mario Bunge, "Analyticity redefined," *Mind*, 70/278 [April, 1961]: 239-45).

falsehood can be determined only by logical and/or linguistic analysis, analytic propositions are essentially "devoid of meaning."⁷⁹ They are "degenerate" propositions in this sense: tautological, non-descriptive, and unconditionally true only at the great cost of bearing no necessary relationship to reality. Our ability to reduce analytic propositions to tautologies (albeit sometimes very elaborate and elegant ones) need not, however, be thought to diminish their value. The truth and tautology of an analytic proposition is only self-evident if we know the meaning and definitions of its terms, and if we thoroughly understand the nature and logic of the system. 2+2=4, for example, is tautologous for most adults, but not for the child learning to count, just as "a bachelor is an unmarried man" is tautologous for speakers of English, but not necessarily so for a French student of English. Though they carry no factual content, analytic propositions thus "flesh out" the nature of the terms and relations involved in a given analytic system. Like the man who says "'I know how tall I am!' and lays his hand on top of his head to prove it,"⁸⁰ however, the analytic proposition has no frame of reference, and thus no "meaning," beyond its own terms. Hempel provides a succinct account of the analytic propositions of mathematics:

⁸⁰ Wittgenstein, Philosophical Investigations, 96 (section 279).

⁷⁹ Victor Kraft states that "Only empirical statements are meaningful, for they alone are verifiable. Mathematical and logical statements, on the other hand, are devoid of meaning . . . [This] claim is easily understood if one keeps in mind that meaning is identified with representative content. Mathematical and logical statements are not assertions about facts, they are only rules" (*The Vienna Circle: The Origin of Neo-Positivism [Der Wiener Kreis: Der Ursprung des Neopositivismus, 1950]*, trans. Arthur Pap [New York: Philosophical Library, 1953], 36).

The propositions of mathematics are devoid of all factual content; they convey no information whatever on any empirical subject matter.⁸¹

Since all mathematical proofs rest exclusively on logical deductions from certain postulates, it follows that a mathematical theorem, such as the Pythagorean theorem in geometry, asserts nothing that is *objectively* or *theoretically* new as compared with the postulates from which it is derived, although its content may well by *psychologically new* in the sense that we were not aware of its being implicitly contained in the postulates.⁸²

Although the analytic propositions of mathematics are universally valid by definition, there has been little agreement among philosophers concerning whether mathematics itself is something we invent or something we discover. According to the "structuralist" or "formalist" view of mathematics, it is a purely human invention, a closed and empty system of self-evident deductions produced from an initial set of axioms. This view constitutes a refutation of the Pythagorean notion that the mysteries of the universe are revealed through mathematics. Like any self-regulating and consistent "game" (chess, for example), mathematics may produce elegant and complex models of truth, without representing any kind of truth in itself. Mathematics, thus conceived, is a closed system of analytical axioms and propositions which bear no inherent relationship to the world beyond themselves.⁸³ (The nature of logical and mathematical formalism will be discussed further in chapter 4).

⁸¹ Carl G. Hempel, "On the Nature of Mathematical Truth," in *Our Mathematical Heritage: Essays on the Nature and Cultural Significance of Mathematics*, ed. W. L. Schaaf (New York: Collier, 1963), 106.

⁸² Hempel, "Geometry and Empirical Science," 118.

⁸³ Hempel, "On the Nature of Mathematical Truth," 93-114.

Synthetic propositions, on the other hand, concern the properties and behaviour of objects, events, and sensations in the real empirical world. They are verifiable (and theoretically falsifiable) statements of *fact*. In short, unlike analytic propositions, which give us understanding and insight into constructed and internally-logical *systems*, synthetic propositions give us knowledge of the world of experience and objective reality. "There is gold in South Africa" is an example of a synthetic proposition. Its logic is generally understood as an *a posteriori* logic, one that follows upon observation.⁸⁴ For the positivist, only synthetic propositions have *factual* cognitive meaning, and there are no factual propositions except those that are testable and falsifiable.

Propositions that are neither analytic nor synthetic in nature are, for the positivist, simply emotive *pseudo-statements*, inherently non-cognitive logical nonsense. Positivists assign much of traditional moral philosophy, metaphysical philosophy, theology, "pseudo-science" ("political theory," for example), "human sciences" (Dilthey's "*Geistwissenschaften*," for example), ⁸⁵ and aesthetics (including much of traditional music theory), to this category. By breaking its traditional

⁸⁵ Wilhelm Dilthey, *Introduction to the Human Sciences* [*Einleitung in die Geistwissenschaften*, 1883], ed. and trans. R. A. Makkreel and F. Rodi (Princeton: Princeton University Press, 1989).

⁸⁴ Empirically-testable propositions are sometimes called "synthetic *a posteriori* statements." It should be noted that earlier philosophers (Kant, most notably) conceived of synthetic propositions of an *a priori* nature (the proposition that "all events have causes", or that "an object cannot be both red *and* blue," for example). The refusal to admit the notion of the synthetic-*apriori* (proposition) is a hallmark principle of logical positivism. See Hans Hahn, Otto Neurath, and Rudolf Carnap, "The Scientific Conception of the World: The Vienna Circle [*Wissenschaftliche Weltauffassung: Der Wiener Kreis*, 1929]," in *Empiricism and Sociology*, trans. Paul Foulkes and Marie Neurath (Dordrecht, Holland: Reidel, 1973), 299-318; Quine, "Two Dogmas of Empiricism."

affiliation with philosophy and arming itself with a positivist epistemology, nineteenth-century science made explosive progress more or less oblivious of ongoing debates concerning the merits of metaphysical philosophy.

THE EPISTEMOLOGICAL FOUNDATIONS OF HARMONIC THEORY: FOUR PROPOSITIONAL CATEGORIES

A broad range of traditional music-theoretical propositions concerning harmony and tonality can be disentangled with the aid of the positivist's synthetic/analytic distinction. As varied as the propositions of harmonic theory have been throughout history, they have always rested upon epistemological foundations which are either synthetic, analytic, style-analytic, or metaphysical in nature. Let us consider the ways in which the propositions of harmonic theory can be aligned into these four propositional categories.

Synthetic Propositions of Harmonic Theory. Synthetic propositions of harmonic theory link harmonic structures to universal acoustic laws or perceptual/cognitive principles that are empirically falsifiable, at least in principle. The following is a sampling of synthetically-based propositions that have been posited by harmonic theorists throughout history:

• Organum theorist Johannes Afflighem posits that composers of organum and early polyphony employed the relative acoustic-simplicity and tension-

free nature of the perfect consonances to convey stability and repose at cadences.⁸⁶

- Zarlino posits that dissonance is softened in perception when it is introduced in a stepwise manner and when its constituent tones are not attacked simultaneously.⁸⁷
- Rameau posits that the principles governing all harmonic phenomena (chords, their progressions, and their role in establishing the domain of key and tonality) are artistic extrapolations from the natural and familiar properties and proportions manifest in the *corps sonore*.⁸⁸
- Schenker posits that tonality and form in music are generated by a systematic, hierarchical, and temporally-extended unfolding and embellishment of the tonic triad, which, itself, is derived from the "chord of nature" (*der Klang in der Natur*).⁸⁹
- Helmholtz and Stumpf posit that perfect consonances which progress in parallel motion are prohibited in common-practice harmonic theory since

⁸⁷ Zarlino notes that "the ear barely notices the suspended dissonance, not being sufficiently stimulated by it to comprehend it fully. Since the notes are not attacked together, it (the dissonance) seems weak to the ear, which is stimulated by notes which are attacked together. . . . Dissonances, although they sound somewhat unpleasant standing alone, are not only bearable but actually refresh and please the ear if they are introduced in a suitable and lawful manner" (*The Art of Counterpoint* [Part III, *Le Institutioni harmonische*, 1558], trans. G. A. Marco and C. A. Palisca [New Haven: Yale University Press, 1968], 53, 97). Wright and Bregman ("Auditory Stream Segregation and the Control of Dissonance") suggest that the perceptual phenomenon Zarlino describes is due to the domination of linear- or melodic-grouping over vertical- or harmonic-grouping in a process Bregman calls "auditory stream segregation."

⁸⁸ Jean-Philippe Rameau, *Nouveau Système de Musique Théorique* [Paris, 1726] (New York: Broude Brothers, 1965); Thomas Christensen, *Rameau and Musical Thought in the Enlightenment* (Cambridge: University Press, 1993); idem., "Eighteenth-Century Science and the *Corps Sonore*: The Scientific Background to Rameau's Principle of Harmony," *Journal of Music Theory* 31/1 (1987): 23–30.

⁸⁹ Heinrich Schenker, *Harmony* [*Harmonielehre*, 1906], trans. Oswald Jonas (Chicago: University Press, 1954), 21–29. Schenker insists, however, that the relevance of the overtone series does not extend beyond the fifth partial: "No overtone beyond the fifth in the series [i.e., the major triad] has any application to our tonal system" (*Harmony*, p. 25). See also Charles J. Smith, "Musical Form and Fundamental Structure: An Investigation of Schenker's *Formenlehre*," *Music Analysis*, 15/2-3 (July-October, 1996): 191–297.

⁸⁶ Claude V. Palisca, ed. *Hucbald, Guido, and John on Music: Three Medieval Treatises* (New Haven: Yale University Press, 1979).

they give rise to a high degree of perceptual fusion, which is contrary to the goal of voice-independence.⁹⁰

- Hanslick proposes that expressive content in music is purely and immanently musical in nature, deriving from a "dynamic discourse of tones." In Hanslick's view, a primary source of motion and expressivity in the pitch-domain is the forward-striving "yearning" of dissonance for resolution in the acoustic stability of consonance.⁹¹
- Hindemith posits that complex chords can be categorized according to gradations from low to high harmonic dissonance and tension, and that, by analyzing these harmonic fluctuations, composers can determine the relative smoothness, coherence, and logic of progressions of complex chords.⁹²

Since they purportedly ground harmonic theory in broad and stable principles of

nature, perception, and cognition, synthetic propositions are the stock-in-trade of

the harmonic universalist.

Analytic Propositions of Harmonic Theory. Analytic propositions of harmonic

theory are essentially formalistic tautologies which are testable only by reference

to the internal logic of the compositional or music-theoretical system in question.

⁹⁰ Hermann Helmholtz, On the Sensations of Tone [Die Lehre von den Tonempfindungen als physiologische Grundlage fur die Theorie der Musik, 1863], trans. Alexander J. Ellis (New York: Dover, 1954), 253–54. For a study of the acoustic pattern factors that contribute to the fusion and segregation of voices in polyphonic textures, see David Huron, "Voice Denumerability in Polyphonic Music of Homogeneous Timbres," Music Perception, 6/4 (1989): 361–82.

⁹¹ Eduard Hanslick, On the Musically Beautiful: A Contribution towards the Revision of the Aesthetics of Music, [Vom Musikalisch-Schönen: ein Betrag zur Revision der Ästhetik der Tonkunst, 1854], ed. and trans. Geoffrey Payzant (Indianapolis: Hackett, 1986). See also Charles Rosen, Arnold Schoenberg (Chicago: University Press, 1975), 25. Earlier theorists, notably Rameau, had also suggested that dissonance is the primary source of forward-striving motion in music (*Treatise on Harmony* [*Traité de l'harmonie*, 1722], trans. Phillip Gossett [New York: Dover, 1971]).

⁹² Paul Hindemith, *Craft of Musical Composition* (Melville, N.Y.: Belwin-Mills, 1942); S. Gut, "Les bases théoriques de l'organisation des sons chez Hindemith," in *Hommage a Paul Hindemith: L'homme et l'oeuvre* (Yverdon: Éditions de la Revue Musicale de Suisse Romande, 1973).

They are universal in the sense that irrefutable mathematical proofs can be offered to support their validity, but such validity can easily be accepted since it refers *not to experience* but rather to the formal properties of the analytic system (and since to deny the validity of any tautology is merely self-contradictory).⁹³ Analytic propositions of harmonic theory are thus relativistic in the sense that their relationship to sound and perception remains in question. The following is a sampling of analytically-based propositions that have been posited by

harmonic theorists throughout history:

- Rameau posits that the major and minor triads are related by virtue of their common total interval content (perfect fifth, major third, minor third), irrespective of vertical ordering.⁹⁴
- Oettingen and Riemann posit that the major and minor triads are related by virtue of their inversional-equivalence, arguing that the harmonic centre of a major triad is its root, that of a minor triad its fifth (a theoretical position known as "harmonic dualism").⁹⁵ Bernhard Ziehn later emphasizes how this same principle of inversional-equivalence becomes an important structural feature in early twentieth-century harmony.⁹⁶

93 Frederic Raphael, Popper (London: Phoenix, 1998), 8.

⁹⁴ Rameau, Treatise on Harmony, 15; David Lewin "Two Interesting Passages in Rameau's Traité de l'harmonie," In Theory Only, 4/3 (1978): 3–11.

⁹⁵ David Bernstein, "Symmetry and Symmetrical Inversion in Turn of the Century Theory and Practice," in *Music Theory and the Exploration of the Past*, ed. Christopher Hatch and David Bernstein (Chicago: University of Chicago Press, 1993), 449–72; idem., "George Capellen's Theory of Reduction: Radical Harmonic Theory at the Turn of the Twentieth Century, *Journal of Music Theory*, 37 (1993): 85–116; Dale Jorgenson, "A Résumé of Harmonic Dualism," Music and Letters, 44/1 (1963): 31–42.

⁹⁶ Bernard Ziehn (1845-1912) is an Austrian-born theorist who emigrated to America in his youth. His theoretical work on inversional-equivalence was known to Schoenberg. Bernard Ziehn, *Canonical Studies: A New Technic of Composition* [1912] (London: Kahn & Averill, 1994). See also Simms "The Theory of Pitch-Class Sets."

- A number of early twentieth-century theorists propose that the evolution of harmonic vocabulary demands the categorization of unique chords in terms of pitch-class and/or interval content. They argue that this taxonomy must be sonance-neutral (i.e., neutral with respect to consonance/dissonance), non-hierarchical (such that no sub-category of chords takes precedence, *a priori*, over any other) and must identify a variety of abstract equivalence classes.⁹⁷
- Schoenberg posits that the principle of complementation (i.e., "the tendency to include in the second chord tones that were missing in the first")⁹⁸ is an important new source of logic, coherence and motion in atonal chord progressions.
- Schoenberg posits a quasi-geometric conception of pitch-space that equates the vertical and horizontal dimensions of music. According to this view, equating harmonic and melodic interval structures is like rotating an object in space.⁹⁹
- Post-war set-theorists (Babbitt, Forte, Lewin, Morris, et al.) posit the structural significance of a variety of abstract modulo-12 inclusion-, equivalence-, and similarity-relationships (as well as a variety of equally abstract modulo-12 operations) for music theory and analysis, in an attempt to formalize aspects of pitch organization in atonal and dodecaphonic music.¹⁰⁰

⁹⁸ For example, see *Theory of Harmony*, 420. See also fn. 47, above.

⁹⁷ Catherine Nolan, "Combinatorial Space in Nineteenth- and Early Twentieth-Century Music Theory," Paper presented at the Annual Meeting of the Society for Music Theory, Toronto, November, 2000. Nolan describes proto set-theoretical aspects in the work of a number of less well-known theorists active at the turn of the century, including Anatole Loquin, Ernst Bacon, Walter Howard, Bernard Weigl.

⁹⁹ "The unity of musical space . . . demands an absolute and unitary perception. In this space, as in Swedenborg's heaven (described in Balzac's *Seraphita*), there is no absolute down, no right or left, forward or backward . . . Just as our mind always recognizes, for instance, a knife, a bottle or a watch, regardless of its positions, and can reproduce it in the imagination in every possible position, even so a musical creator's mind can operate subconsciously with a row of tones, regardless of their direction" ("Composition with Twelve Tones I [1941]," in *Style and Idea*, 223). See also Rufer, *Composition with Twelve Tones*, 51, 82–83; Carpenter and Neff, Commentary on *The Musical Idea*, 60–61.

¹⁰⁰ The inversional-equivalence principle, the Z-relation, set complexes, cyclic sets, nexus sets, Klumpenhouwer networks, and Riemannian operations, for example. Bryan Simms' "The Theory of Pitch-Class Sets" is an excellent general review of the principles and history of set theory. See also John Rahn, *Basic Atonal Theory* (New York: Longmans, 1980).

Underlying all analytic propositions is a formalistic conception of harmony that is often characterized by an insouciance concerning acoustics and perception, sometimes even by an unabashed denial of their existence or relevance. Ernst Krenek was acknowledging this heightened tendency to conceive of musical structure as a form of analytic logic when he referred to the twentieth-century composer's "freedom to posit axioms."¹⁰¹

Style-Analytic Propositions of Harmonic Theory. Style-analytic propositions address repertoires of notated music. They are descriptive propositions that are arrived upon by induction, and they are testable only against a delimited repertoire: that of a given time-period, place, school, composer, or individual work. There is a closed, circular, and reciprocal relationship between style-analytic propositions and the data from which they are generated, such that style models can be refined by new data and applied recursively back to the body of data. Since they do not address the compositional or listening situation directly, however, style-analytic propositions do not generally seek support in musical universals (though they may presuppose them). The nineteenth-century theorist Gottfried Weber was one of a long tradition of theorists, from Tinctoris to

¹⁰¹ Ernst Krenek's employment of this phrase is cited in Carl Dahlhaus, "A Rejection of Material Thinking," in *Schoenberg and the New Music: Essays by Carl Dahlhaus*, trans. Derrick Puffett and Alfred Clayton (Cambridge: Cambridge University Press, 1987), 276. Dahlhaus quotes Krenek without citing his source.

Jeppesen,¹⁰² who have understood the role of the music theorist as that of a patient collector of compositional style-features. Weber vehemently rejected synthetic and analytic systematizations of music theory.¹⁰³

The bewildering acceleration of stylistic change during the early years of the twentieth century nonetheless gave rise to a renewed interest in a universalistic approach to style criticism. Guido Adler sought to establish a more secure foundation for musicology by extending its reach beyond the inherent circularity of traditional style-analytic propositions.¹⁰⁴ Adler recommended the bifurcation of musicology into "historical" and "systematic" branches. The stated objective of systematic musicology was to investigate musical universals; i.e., those style principles that represent a comparative stability within the fluidity of historical change. This approach was well known in Schoenberg's Vienna, and its influence was disseminated by Adler's many prominent students (including

¹⁰² Johannes Tinctoris, *The Art of Counterpoint* [*Liber de arte contrapuncti*, 1477], trans. and ed. A. Carapetyan (Rome: Musicological Studies and Documents, 1961); Knud Jeppesen, *The Style of Palestrina and the Dissonance* [*Die Dissonanzbehandlung bei Palestrina*, 1922], trans. Ejnar Munksgaard (New York: Dover, 1970).

¹⁰³ For Weber, the art of music could not be derived in a logical manner from foundational firstprinciples. Rejecting models based upon the harmonic series, the mathematical representation of intervallic relationships, and the derivation of the major scale from the primary triads, Weber reverted to a fully inductive approach to the theory of harmony, an orientation which harkens back to earlier thoroughbass theory (Heinichen, Mattheson and C. P. E. Bach, for example). Gottfried Weber, *The Theory of Musical Composition [Versuch einer geordneten Theorie der Tonsetzkunst*, 1832], trans. J. F. Warner (London, 1851).

¹⁰⁴ Schoenberg's *Harmonielehre* was published during the year Adler identifies as the most significant turning point in the history of style and style criticism. "In 1911" Adler writes, "to concern oneself with musical style was, one might say, in the air" (Guido Adler, "Style Criticism [*Der Stil in der Music*, 1911]," *The Musical Quarterly* [1934]: 172). See also Thomas Harrison, 1910: *The Emancipation of Dissonance* (Los Angeles: University of California Press, 1996).

Webern, Pisk, Weigl, Jeppesen, Fischer, and Kurth).¹⁰⁵ Together with the other founders of systematic musicology (Hugo Riemann, Walther Wiora, et al.), Adler maintained that in order to understand the variables of style, it is necessary to understand universals.¹⁰⁶ "One cannot comprehend and explain the variability of human culture," Meyer would write generations later, echoing Adler, "unless one has some sense of the constancies involved in their shaping."¹⁰⁷ This conception of style was countered by critics who favoured the "particularist" (or "nominalist") approach to style-criticism. For particularist aestheticians such as Benedetto Croce, each work of art establishes its own aesthetic parameters and must always be understood on its own terms, in all of its specificity, without regard for extra-opus norms or categories of any kind.¹⁰⁸ (The particularist critique of generalized theoretical approaches to music analysis will be examined in more detail in chapter 4.)

¹⁰⁷ Leonard B. Meyer, "A Universe of Universals," Journal of Musicology 16/I (Winter, 1998): 3.

¹⁰⁵ Schoenberg knew Adler well. They were both prominent figures among Vienna's musical intelligentsia, they had students in common (Webern, for example), and they exchanged correspondence on musicological matters (Egbert M. Ennulat, *Arnold Schoenberg Correspondence: A Collection of Translated and Annotated Letters exchanged with Guido Adler, Pablo Casals, Emmanuel Feuermann and Olin Downes* [Blue Ridge Summit, Penn.: Scarecrow Press, 1991]).

¹⁰⁶ Guido Adler, "Umfang, Methode und Ziel der Musikwissenschaft," *Vierteljahresscrift für Musikwissenschaft* (1885); Walter Wiora, "Musikwissenschaft und Universalgeschichte," *Acta Musicologica*, 33 (1961): 84–104; Andrew D. McCredie, "Systematic Musicology—Some Twentieth-Century Patterns and Perspectives," *Studies in Music*, 5 (1971): 1–35; Martin Vogel, *Die Lehre von den Tonbeziehungen* (Bonn: Verlag für systematische Musikwissenschaft, 1975).

¹⁰⁸ Benedetto Croce, *Aesthetics as the Science of Expression and General Linguistics*, trans. Douglas Ainsle (London: MacMillan and Co., 1902); Myra E. Moss, ed. and trans., *Benedetto Croce: Essay on Literature and Literary Criticism* (Albany, New York: State University of New York Press, 1990). Croce and particularist perspective will be discussed in more detailed in chapter 4, below (see p. 169).

Metaphysical Propositions of Harmonic Theory. Metaphysical propositions include those that involve the language of religion, theology, aesthetics, ethics, and metaphysical philosophy (Hegel's dialectics, for example). The word "metaphysical" is taken here in the broadest sense.¹⁰⁹ Metaphysical propositions of harmonic theory include those that address questions of value, meaning, affect, theology, and cosmology. The following is a sampling of metaphysical propositions that have been posited by harmonic theorists throughout history:

- Lippius posits that the primacy of the triad is rooted in a theological symbolism that is the music-structural counterpart to the Christian doctrine of the Trinity.¹¹⁰
- Rameau posits that mystical and divine properties are embodied in the vibrational ratios of the *corps sonore*, which are in turn manifest in universal principles of melodic and harmonic organization.¹¹¹
- Schenker posits that the eternal *value* of the musical masterwork derives from a form of hierarchical, organic, and tonal organization that his reductive system elucidates and exposes.¹¹²

¹⁰⁹ I am again employing Carnap's definition of "metaphysics" (see fn. 73, above).

¹¹² William Pastille, "Schenker's Value Judgments," *Music Theory Online*, 1.6 (1995); Leslie D. Blasius, *Schenker's Argument and The Claims of Music Theory* (Cambridge: University Press, 1994). See also Yuhwen Wang, "Value Judgment and Musical Explanation: Their Roles in Selected Writings of Edward T. Cone" (Ph.D. Dissertation, Columbia University, 1998).

¹¹⁰ Johannes Lippius, Synopsis of New Music [Synopsis musicae novae omino verae atque methodicae universae, 1612], trans. and ed. Benito V. Rivera (Colorado Springs: Colorado College Music Press, 1977).

¹¹¹ Erwin R. Jacobi, "'Verités intéressantes': le dernier manuscrit de Jean-Philippe Rameau," *Revue de Musicologie*, 50 (Juillet, 1964): 76–109; Herbert Schneider, Jean-Phillippe Rameaus letzter *Musiktraktat: Verités également ignorées et intéressantes tirées du sein de la nature* (1764), *kritische Ausgabe mit Kommentar. Beihefte zum Archiv für Musikwissenschaft*, 25 (Stuttgart: Franz Steiner, 1986).

- Hauptmann posits that dialectical metaphysics can be invoked in support of the primacy of the triad and of the structural role of subdominant (unity), dominant (duality), and tonic (unified duality) in diatonic tonality.¹¹³
- Kretzschmar posits that traditional music theory (harmony, form, etc.) merely describes a "husk and shell" of music, which must be peeled away in order to expose its more central emotional and spiritual content.¹¹⁴
- Kurth describes music as "psychic motion."¹¹⁵

Although metaphysical propositions are generally posited as universals, they fail the positivist's test of intersubjective verification and falsifiability. In general, harmonic universalists have sought more secure footing for their postulates within the epistemological framework of the positivist program (i.e., in synthetic and analytic propositions), and metaphysical speculations have been considered tantalizing but tangential tributaries to the mainstream of western music theory.¹¹⁶

SCHOENBERG'S UNIVERSALISM: THE ICARUS PRINCIPLE

Let us now examine Schoenberg's conception of harmony and aesthetics in light of the four propositional categories that we have identified. Given the

¹¹³ Moritz Hauptmann, *The Nature of Harmony and Metre* [*Die Natur der Harmonik und der Metrik zur Theorie der Musik*, 1853], trans. W. E. Heathcote (New York: Da Capo, 1991); Marc McCune, "Moritz Hauptmann: *Ein Haupt-Mann* in Nineteenth-Century Music Theory," *Indiana Theory Review* 7/2 (1986): 1–28.

¹¹⁴ Lee Rothfarb, "Hermeneutics and Energetics: Analytical Alternatives in the Early 1900s," *Journal of Music Theory*, 36 (1992): 43–68.

¹¹⁵ Dolores Hsu, "Ernst Kurth and His Concept of Music as Psychic Motion," *Journal of Music Theory*, 10 (1966): 2-17; Geoffrey Chew, "Music as Psychic Motion and Tristan and Isolde: Toward a Model for Analyzing Musical Instability," *Music Analysis*, 10 (1991): 171–93.

¹¹⁶ The overwhelmingly positivist "program" of traditional music theory has been well documented by its postmodern critics. See, for example, Joseph Kerman's *Contemplating Music* and Lawrence Kramer's *Classical Music and Postmodern Knowledge*.

revolutionary and relativistic nature of Schoenberg's view of harmony and dissonance (summarized at the outset of this chapter), we might assume that he would have dismissed the very notion of harmonic universals out of hand, on the grounds that foregone conclusions about musical value inevitably follow from it: namely, that music of value must always be tonal music and that dissonance must behave in prescribed ways. Indeed Schoenberg not only vehemently counters this "tonality-imperative" view, he often portrays universalist theorists as obscurantist pedants and reactionaries who seek to stifle compositional liberty and creativity by insisting upon conformity to nature. Harmonic innovation, he asserts, "would have stopped, had the will and talents of the theorists prevailed!"¹¹⁷ However, an overview of Schoenberg's commentary on harmonic theory suggests that he was more ambivalent concerning the question of harmonic universals than this polemical language indicates. He draws a clear distinction between the laws of nature and the laws of art:

Tonality has been revealed as no postulate of natural conditions, but as the utilization of natural possibilities; it is a product of art, a product of the technique of art. Since tonality is no condition imposed by nature, it is meaningless to insist on preserving it because of natural law.¹¹⁸

His scorn was directed not toward harmonic universalism in general, but rather toward a sub-group of universalists that we might call "the tonality-imperative"

¹¹⁸ "Problems of Harmony [1934]," in Style and Idea, 284.

¹¹⁷ Theory of Harmony, 313.

theorists," notably Hauptmann, Riemann, and Schenker. Hauptmann, for example, dismissed the suggestion that the tonal system might be "artificial" in origin:

The notion of an artificial system of notes is a thoroughly useless one. Musicians were not able to determine intervals and invent a system of notes, any more than grammarians to invent the words of the language in which they speak, and the constructions they use in explaining constructions. They speak with the language which is common to all mankind.¹¹⁹

Schoenberg also employs an analogy to natural language, but in order to counter

Hauptmann's view:

One may let oneself be carried by language, but it carries only the man who would be capable, if it did not exist, of inventing it himself.¹²⁰

Tonality is not something which the composer unconsciously achieves, which exists without his contribution and grows of itself, which would be present even if the composer willed the opposite; since, in a word, tonality is neither a natural nor an automatic consequence of tone combination. It cannot therefore claim to be the automatic result of the nature of sound and an indispensable attribute of every piece of music.¹²¹

Nowhere in his theoretical writings, however, does Schoenberg

categorically reject harmonic universalism. He insists only that the equation of

harmonic universalism with aesthetic universalism (upon which the tonality-

imperative view hinges) was not a necessary one. Indeed it is entirely possible,

¹²¹ "Problems of Harmony [1934]," in Style and Idea, 275.

¹¹⁹ Hauptmann, *The Nature of Harmony and Metre*, xl-xli.

¹²⁰ "Problems in Teaching Art [1911]," in *Style and Idea*, 369. In the context of this essay, I interpret this sentence to mean that composers must develop the capacity not only to work within a pre-existing musical language, but also to invent their own.

with neither inconsistency nor contradiction, for a theorist or composer to be both a harmonic universalist and a cultural-, aesthetic-, and tonal-relativist. That is, one can endorse the idea of neutral standards regarding the nature of musical *materials*, without endorsing neutral standards concerning the *manner of employment* of these materials in art.

Many harmonic universalists adopted precisely Schoenberg's position,

cautiously avoiding proclamations concerning the aesthetic necessity of tonality,

perhaps out of an awareness of the problems and pitfalls inherent in

extrapolating assertions of musical value from universals. Hanslick, for example,

is effusive in his desire to clarify this question concerning the nature of the

relationship between natural first principles and musical language:

Nature provides material [*Stoff*] for music, [but] it turns out that it does this only in the most inferior sense of supplying the raw materials which mankind makes into music.... Nature is related to the arts as a motherly dispenser of the first and most important dowry ... each of the particular arts is linked to its natural first principles by a delicate strand.¹²²

Nature has endowed mankind with the ability to construct a tonal system, bit by bit, upon the basis of the simplest relationships (the triad, the harmonic series). These alone will continue to be the changeless foundations of any further construction. One should be on guard against the error of thinking that this tonal system, our present one, necessarily exists in nature. That naturalists nowadays casually treat musical relationships as if they were natural forces in no way stamps the laws governing music as natural laws; this is a consequence of our endlessly expanding musical culture.¹²³

¹²³ Ibid., 70.

Nature does not give us the artistic materials for a complete ready-made tonal system but only the raw physical materials which we make subservient to music.¹²⁴

Schoenberg reinforces the same position with the aid of an analogy to gravity:

There is no reason in physics or aesthetics that could force a musician to use tonality in order to represent his idea. The only question is whether one can attain formal unity and self-sufficiency without using tonality. The appeal to its origin in nature can be refuted if one recalls that just as tones pull toward triads, and triads toward tonality, gravity pulls us down toward the earth; yet an airplane carries us up away from it. A product can be apparently artificial without being unnatural, for it is based on the laws of nature to just the same degree as are those that seem primary.¹²⁵

This quotation is profoundly revealing regarding Schoenberg's

epistemological stance. Implicit in his analogy to gravitation is the notion that composers can strive to resist or manipulate harmonic universals, for aesthetic purposes, without denying their existence or universality. The confusion that Hanslick and Schoenberg wish to dispel is known to philosophers as the "is/ought fallacy."¹²⁶ The is/ought dichotomy has a long history extending back at least to Hume.¹²⁷ It can be illustrated with reference to Schoenberg's gravity

¹²⁴ Ibid., 72.

¹²⁶ Angeles, Dictionary of Philosophy, s.v. "Is/Ought Fallacy."

¹²⁷ Hume was the first philosopher to point to the unbridgeable epistemological gap between factual "is" statements and the "ought" statements of morality and values. He develops a uniquely radical empiricism and a type of ethical philosophy which has been called "meta-ethics" – the study of moral language, its meaning, function and certainty. David Hume, A *Treatise*

¹²⁵ "Opinion or Insight [1926]" in *Style and Idea*, 262. It is worth noting in this connection that Schoenberg had a particular fascination with air flight. Lovina May Knight writes: "One part of our modern civilization appeared to hold a special fascination for him, namely aeroplanes. Several times [during composition classes], upon hearing a plane roar overhead, Schoenberg dropped what he was doing and hurried to the window" ("Classes with Schoenberg," *Journal of the Arnold Schoenberg Institute*, 13/2 [November, 1990]: 156).

analogy. One can clearly assert that gravity *is* a universal of terrestrial physics without at the same time claiming that our feet *should* never leave the ground, or that jumping, designing aircraft, or keeping them aloft for extended periods of time, should be prohibited. Similarly, it is possible to assert that the sonance hierarchy (from low to high consonance/dissonance) is a universal of music theory, without at the same time claiming that pandissonant music, or music which does not employ systematic fluctuations and dependency-relations between consonance and dissonance, is somehow "anti-music,"

incomprehensible because it is "unnatural." Schoenberg poses the question thus:

Can one understand sound-combinations if they hang for ever in the air and never settle down; if they never gain a firm footing? I read somewhere of a device by which aeroplanes refuel over the sea without standing firm anywhere ... If that is possible, should one not do it?¹²⁸

The ancient myth of Icarus and Daedalus can be invoked to further illustrate the point. Schoenberg's gravity analogy suggests that composers need to be aware of acoustic and perceptual universals, but need not obey them in simplistic or unimaginative ways, any more than the mythological Icarus needed to abandon his aspiration to fly toward the sun. According to this view, nothing should deter composers (nor should have deterred Icarus) from striving toward their imaginative aspirations and goals, but they can only achieve these goals if

¹²⁸ "New Music: My Music [1930]," in *Style and Idea*, 101.

of Human Nature: Being an Attempt to Introduce the Experimental Method of Reasoning into Moral Subjects [1740], ed. D. G. C. MacNabb (London: Collins, 1962).

they respectfully understand and acknowledge the power of nature in the world, even if only to counter it. From this perspective, compositional aesthetic *values and goals* are always relative, but the compositional strategies and structures enlisted to achieve them may not be (the invocation of the Greek name "Icarus" seems particularly apt in this context, since it means "skillfully wrought"). Despite his determination to reach the Gods, Icarus was abruptly reminded of the power of two powerful forces of nature: heat and gravity. His desire to resist nature's domination was perhaps admirable and attainable in principle, but his failure was a consequence of adopting a strategy that did not adequately account for the sovereignty of universal laws.¹²⁹

Though he did not give it a name, a preponderance of converging evidence suggests that Schoenberg fully ascribed to the view that I have illustrated with "the Icarus principle." Proto-modernist painter Piet Mondrian, Schoenberg's contemporary, has described how this aspect of modernism namely the stance adopted by the modernist vis à vis nature — has been generally misunderstood. "Abstract art," writes Mondrian, "is opposed to a natural representation of things, but it is *not opposed to nature* as is generally thought."¹³⁰

¹²⁹ My analogy to the myth of Icarus and Daedalus was inspired both by Schoenberg's gravity analogy as well as a similar one used by Meyer ("A Universe of Universals"), who compares compositional strategies to those employed by birds to avert the omnipresence of gravity.

¹³⁰ Piet Mondrian, "Plastic Art and Pure Plastic Art," in *The New Art -- The New Life: The Collected Writings of Piet Mondrian*, trans. and ed. H. Holtzmann and Martin S. James (London: Thames and Hudson, 1986), 293.

Schoenberg's above-cited analogy between tonality and gravity is a case in point, and it is not unique in this respect. Throughout his theoretical writings Schoenberg repeatedly refers to the role of natural laws in music. We have seen how, in *Harmonielehre*, he describes the pursuit of pandissonance as an inevitable evolutionary exploration of the "more remote overtones" of the harmonic series (see above, p. 16). Schoenberg's intent was clearly to endorse the liberation of dissonance from its traditional role. By buttressing his argument on the overtone series, however, he grounds his notion of the "emancipation of dissonance" in a fundamentally *synthetic* proposition: namely that "all musical phenomena can be referred to the overtone series."¹³¹ This orientation is antithetical to a fully relativistic, analytic, or formalistic conception of harmony.

References to the "laws of nature" continue to appear throughout Schoenberg's later theoretical writings. He penned the following account of the composer's "road of exploration" during the last decade of his life:

The desire for a conscious control of the new means and forms will arise in every artist's mind; and he will wish to know consciously the laws and rules which govern the forms which he has conceived 'as in a dream.' Strongly convincing as the dream may have been, the conviction that the new sounds obey the laws of nature and of our manner of thinking – the conviction that order, logic, comprehensibility and form cannot be present without obedience to such laws – forces the composer along the road of exploration.¹³²

¹³¹ "Problems of Harmony [1934]," in Style and Idea, 271.

¹³² "Composition with Twelve Tones I [1941]" in *Style and Idea*, 218.

Furthermore, the harmonic rules Schoenberg employs in twelve-tone technique are not arbitrary. Many of them – the avoidance of perfect consonances and triads,¹³³ and the employment of tritone-related row transpositions,¹³⁴ for example – are designed to *control* and *counter* harmonic universals. These self-consciously "contratonal" techniques suggest an acknowledgment that some of the forces underlying tonality are universal, just as the systematically "anti-gravitational" features of aircraft-design indirectly acknowledge the universality of gravity.¹³⁵

Finally, to suggest (as the radical harmonic relativist must) that the allegedly immutable laws that harmonic universalists have posited are either non-existent or irrelevant, is to suggest that the composer can defy them without consequence. This was assuredly not Schoenberg's view. Schoenberg was fully aware of the range of consequences that attended the employment of "emancipated" and unresolved harmonic dissonance. Though he felt that new means and parameters

¹³³ "Opinion or Insight [1926]," in *Style and Idea*, 263; Rufer, *Composition with Twelve Tones*, 90. For a summary of some of the standard principles and procedures of classical dodecaphonic composition, see (for example) George Perle, *Serial Composition and Atonality: An Introduction to the Music of Schoenberg, Berg, and Webern*, 6th ed. (Berkeley and Los Angeles: University of California Press, 1991), 2–3.

¹³⁴ The tritone relation is featured prominently in Schoenberg's first entirely twelve-tone composition, the piano *Suite*, opus 25.

¹³⁵ The term "contratonal" (in preference to "atonal" or Schoenberg's preferred "pantonal") is borrowed from David Huron ("The Contra-Tonal Structure of Schoenberg's Twelve-Tone Rows," Poster presentation, Annual Meeting of the Society for Music Theory, Toronto, November, 2000). Meyer also describes how such "contratonal" principles are conscientiously built into the twelvetone method (*Music, the Arts, and Ideas* [Chicago: University Press, 1967], 240–42).

of expression could be explored (in rhythm, dynamics, orchestration and timbre, for example), he knew that twelve-tone technique had disabled a powerful and universal tool of expressivity in the pitch domain.¹³⁶ Schoenberg turned to these other parameters in search of new means of expressivity, since pitch-expression had been largely neutralized in twelve-tone technique. Charles Rosen also observes this correlation, but the causality is reversed in his account: "[the] new eminence of color, texture, and dynamics entails, as a consequence, something that most respectable musicians have been reluctant to admit because it is conceived as something disreputable: the downgrading of the importance of pitch."137 Furthermore, Schoenberg knew that the abandonment of the tonal centre and the primacy of the triad (and consonant interval) had removed a fundamental structural principle from which musical "motion" and the formation of structural hierarchies (gestural, phrase-structural, and formal) had derived:138 All the tonal successions, chords, and chord-successions in a piece [of tonal music] achieve a unified meaning through their definite relation to a tonal centre and also

¹³⁷ Rosen, Arnold Schoenberg, 49.

¹³⁶ Thomas Harrison notes that the loss of expressive range in the pitch domain may not have been of great practical concern for Schoenberg, since extended and unresolved harmonic tension was fully consistent with the goals of the angst-ridden expressionist aesthetic (*1910: The Emancipation of Dissonance*, 49). Meyer describes this restricted expressive range as an unrelenting emotional intensity: "Schoenberg's music is, to a considerable extent ... almost hysterically emotional because its intensely directive motion can find no points of real repose. It is driven frantically toward the unattainable" (*Music, the Arts, and Ideas*, 243).

¹³⁸ Carol Krumhansl, "The Perception of Tone Hierarchies and Mirror Forms in Twelve-Tone Serial Music," *Music Perception*, 5/1 (1987): 31–77.

through their mutual ties. . . . The degree of relationship allows a graduated removal of individual parts [of the form] away from the tonal centre, according to the degree of their meaning: more remote digressions can thus be characterized differently from ideas that are closely related. . . . All of this is possible for masters of form to make manifest through [tonal] harmony. Characteristic kinds of beginnings and endings, basic and concentrated or resolving and liquidating dispositions of the harmony and many other means of art have accomplished that great clarity necessary to formal ends. . . . I perceive in both these functions, the conjoining and the unifying on the one hand, and the articulating, separating, and characterizing on the other, the main accomplishments of tonality.¹³⁹ In the absence of these infra-structural underpinnings of tonality, the seemingly diminished capacity of atonal and twelve-tone music to generate extended formal structures was an area of particular concern for Schoenberg:

Renunciation of traditional means of articulation made the construction of larger forms temporarily impossible.¹⁴⁰

It seemed at first impossible to compose pieces of complicated organization or of great length. . . . A little later I discovered how to construct larger forms by following a text or a poem.¹⁴¹

¹³⁹ "Problems of Harmony [1934]," in Style and Idea, 278.

¹⁴⁰ "Opinion or Insight [1926]," in Style and Idea, 262.

¹⁴¹ "Composition with Twelve Tones I [1941]," in *Style and Idea*, 217. Meyer also remarks upon the apparent incapacity of the twelve-tone system to generate extended forms other than "canons, variations, and additive structures whose parts are often defined by the limits of serial statements" (*Music, the Arts, and Ideas*, 312).

From the very beginning, this was clear in my mind: tonality's aids to articulation having dropped out, one must find some substitute, so that longer forms can once more be constructed.¹⁴²

Twelve-tone technique had seemingly relegated harmony to a diminished role as little more than the unifying "tissue" of musical texture, a means for achieving stylistic cohesion.¹⁴³ Schoenberg struggled with these issues throughout his theoretical writings, and he actively sought to compensate for the losses with new formal, structural, and expressive principles. In so doing he acknowledges, both directly and indirectly, that "[tonality's] close accord with nature offers great advantages to those who use it":¹⁴⁴

With the renunciation of the formal advantages inherent in tonal cohesion, presentation of the idea has become rather harder; it lacks the external rounding-off and self-containedness that this simple and natural principle of composition brought about better than did any of the others used alongside it.... To find means of replacing this is the test of the theory of twelve-tone composition.¹⁴⁵

SCHOENBERG'S RELATIVISM AND CONVENTIONALISM: THE SCHENKER/SCHOENBERG CONTROVERSY

We have seen that Schoenberg did not espouse a fully relativistic view

concerning of the *materials* of music. His relativism is rather a purely

cultural/aesthetic one that hinges on the notion that composers must be liberated

to manipulate the materials of music freely, in pursuit of whatever aesthetic goals

¹⁴² "Opinion or Insight [1926]," in *Style and Idea*, 263.

¹⁴³ "Problems of Harmony [1934]," in *Style and Idea*, 279.

¹⁴⁴ "Opinion or Insight [1926]," in *Style and Idea*, 259.

¹⁴⁵ "Hauer's Theories [1923]," in Style and Idea, 209.

they may envision. It is a position that weighs heavily in favour of the boundless capacity of both the creative imagination and learned perception.

Schoenberg's relativism is perhaps most tangibly illustrated in a series of polemical volleys exchanged with Heinrich Schenker, the most doctrinaire of the tonality-imperative theorists among his contemporaries. Schoenberg and Schenker became embroiled in a debate that has preoccupied much of the history of harmonic theory. At issue was the establishment of criteria by which to designate vertical simultaneities as "chords." Although fully-independent dissonant vertical sonorities (i.e., unprepared and unresolved dissonant chords) were clearly emerging in compositional practice, they were uncongenial for traditional theory, according to which the introduction and resolution of dissonance must be understood in terms of normative procedures of linear voiceleading. In the eighteenth century, Kirnberger had introduced two new terms to harmonic theory in order to distinguish the commonplace and more stronglyintegrated vertical dissonances (the seventh-chord, for example) from those that were "accidental" (*zufällig*) by-products of linear voice-leading.¹⁴⁶ He called the first type of dissonance "essential" (*wesentlich*) and the latter "non-essential" (*unwesentlich*). Throughout the nineteenth century the related terms "chordal

¹⁴⁶ Johann Philipp Kirnberger, *The Art of Strict Musical Composition* [*Die Kunst des Reinen Satzes in der Musik*, 1779], trans. and ed. David Beach and Jurgen Thym (New Haven: Yale Press, 1982).

dissonance" and "non-chordal dissonance" were widely adopted.¹⁴⁷ Both Schenker and Schoenberg vehemently challenged the traditional definition of these terms.¹⁴⁸ Schenker insisted that no dissonances can be properly described as chordal dissonances. He maintained that dissonances are always non-chordal by virtue of their inherent forward-striving tendency toward resolution in the consonant triad.¹⁴⁹ His reductive system describes the subjugation of dissonance to consonance on the foreground, middleground, and background levels of harmonic structure. Schoenberg adopted the diametrically opposite view. He insisted that no dissonances are inherently non-chordal. For Schoenberg, any simultaneity can be considered chordal irrespective of considerations of sonance. "Nonharmonic tones do form chords [Zusammenklänge], hence are not nonharmonic," he affirms, "the musical phenomena they help to create are harmonies, as is everything that sounds simultaneously."¹⁵⁰ Schoenberg insists that chords can be whatever the composer wishes to say they are, by *fiat*, and that

¹⁵⁰ Theory of Harmony, 309.

¹⁴⁷ See Robert Wason, *Viennese Harmonic Theory from Albrechtsberger to Schenker and Schoenberg* (Ann Arbor: U.M.I. Press, 1984), 13.

¹⁴⁸ Carl Dahlhaus, "Schoenberg and Schenker," *Proceedings of the Royal Musical Association*, 100 (1973-74): 209-15; Jonathan Dunsby, "Schoenberg and the Writings of Schenker," *Journal of the Arnold Schoenberg Institute*, 4/I (October, 1977): 26-33; Charlotte E. Erwin and Bryan R. Simms, "Schoenberg's Correspondence with Heinrich Schenker," *Journal of the Arnold Schoenberg Institute*, 5/1 (June, 1981): 23-43; Bryan R. Simms, "New Documents in the Schoenberg-Schenker Polemic," *Perspectives of New Music*, 1/16 (Fall-Winter, 1977): 110-24.

¹⁴⁹ See Schenker's essay "Further Considerations of the Urlinie: II," in *The Masterwork in Music* [*Das Meisterwerk in der Musik*, 1926], vol. 2, ed. William Drabkin, trans. Ian Bent (Cambridge: Cambridge University Press, 1996), 1-19. Schenker devotes the latter half of this essay – a section titled "The Dissonance is Always a Passing Event, it is Never a Composite Sound" (pp. 9-18) – to an invective against Schoenberg's conception of chordal dissonance.

harmonic and contrapuntal treatment is always a matter of *convention* and compositional style, not a set of immutable and universal artistic laws. He was articulating, almost in caricature, precisely the vertical conception of harmony that Schenker sought to abolish.

Schenker appealed to the authority of figured-bass practice to support his view. He offers in evidence an illustration from Johann Sebastian Bach's "Booklet on Figured-Bass" (Example 1):¹⁵¹

Bach [does not] designate d in the second chord [*] by the figure 9. This is not at all an example of a true ninth, but of a note sustained in the inner voice which maintains no vertical relationship to the neighbour note of the bass.... Thoroughbass is forced to



Example 1

skip over so many [such] phenomena because it can find no notation for them, and can issue none without misleading the player.... There can be no talk of a composite sound – the figuring is rather a signal for continuo players, whose task it is to sense the neighbour-note formation and insert the sustained note.¹⁵²

The deep gulf between this conception of harmony (and of the nature and role of dissonance in particular) and Schoenberg's view is revealed by juxtaposing Schenker's account of Example 1 with Schoenberg's description of the contrary-motion scalar figure shown in Example 2a.¹⁵³ In his "reduction" (Example 2b) of

153 Theory of Harmony, 322.

¹⁵¹ Philipp J. Spitta, J. S. Bach, Vol. II (Leipzig, 1880), 913.

¹⁵² "Further Considerations of the Urlinie: II," 11.

this commonplace passage,¹⁵⁴ Schoenberg suggests that chordal characteristics can be ascribed to fleeting simultaneities that would be attributed to non-chord tones by traditional harmonic analysis. He justifies his explanation with a somewhat tongue-in-cheek rhetorical flourish:



Example 2

I maintain that these are chords, not of the system, but of music. Somebody will object: 'Yes, but they just happen by virtue of passing tones.' I shall reply: 'The seventh and the ninth chord likewise just happened by virtue of passing tones before they were accepted into the system'. He will say: 'The seventh chord and the ninth chord were not such harsh dissonances as these.' I shall ask: 'How does he know that? ... Our dissonances here do not really seem all too harsh, otherwise surely no one would dare to write them.' Somebody will counter: 'They dare only because the dissonances go by so fast, because the resolution is already there before we become conscious of the dissonance.' My reply: 'What is fast anyway? . . . What if it just stayed in the unconscious? Does anyone really believe that such simple processes of the unconscious do not finally enter the consciousness of artists who year-in and yearout consciously write and play such harmonies?'155

Schenker was not isolated in his opposition to this view. For most

harmonic theorists, both among Schoenberg's contemporaries and those of the

present day, Schoenberg's account is "hard to digest."156 I would argue that

¹⁵⁴ See the final measure of J. S. Bach, *Goldberg Variations* (BWV 988), Variation 1, for example.

¹⁵⁵ Schoenberg, *Theory of Harmony*, 322–23. Schoenberg's somewhat Freudian vocabulary – then very much in currency and vogue in Vienna – is noteworthy at the end of this quotation.

¹⁵⁶ Andrew Anderson, "Why is Schoenberg's Seventeenth Chapter so Hard to Digest?" *Indiana Theory Review*, 15/2 (Fall, 1994): 1–16.

Schoenberg's purpose was not so much to describe how these contrary-motion scales are heard, or to invalidate conventions of common-practice harmonic analysis that had been grounded in centuries of accumulated experience, as it was to refute the notion that there are universal *aesthetic* constraints on dissonance. By drawing attention to the acoustic facts of the passage shown in Example 2, he intended to show that the "new chords" of twentieth-century music are not entirely without historical precedent, i.e., that it is the context of their appearance which is novel, not the simultaneities themselves.

The caprice of Schoenberg's rhetoric did little to persuade Schenker. He rejected Schoenberg's view in the strongest terms:

Schoenberg has no idea of the passing note. For his narrowly circumscribed purpose he clings to a passing sound with a sustained note, and is unable to see beyond it.... Schoenberg has too little understanding of the passing note which he attacks.¹⁵⁷

Schoenberg also described the ninth-, eleventh- and thirteenth-chords as distinct and fully invertible chordal entities, and he employed them as such in composition.¹⁵⁸ For Schenker, the vertical acoustic "fact" of these dissonances is irrelevant:

"It contradicts the nature of the dissonant passing note to discriminate in any substantial way among the intervals of the fourth, the seventh, and the ninth, to say nothing of positing an increasing scale of dissonance for these intervals: the vertical dimension is altogether excluded, everything hinges on the

¹⁵⁷ "Further Considerations of the Urlinie: II," 15-16.

¹⁵⁸ The inverted ninth chord in *Verklärte Nacht* is a celebrated example. See David Lewin, "On the Ninth Chord in Fourth Inversion from *Verklärte Nacht*," *Journal of the Arnold Schoenberg Institute*, 1/10 (June, 1987): 45–64.

horizontal tension alone. It is as though there were nothing but a vacuum separating the dissonant passing note and the sustained note [beneath it]."¹⁵⁹

Just as Schenker derides Schoenberg for gazing at "vertical stacks of notes [Ton-

Übereinander],"160 Schoenberg admonishes Schenker for narrowly fixating on the

written score and for paying undue homage to contrapuntal conventions:

What else is the appoggiatura but an embarrassed concession that the ear with its sharp perception, makes to the slow-witted eye. Here something is supposed to sound whose notation the eye cannot tolerate.... One's inability to regard it as a chord does not mean it is not a chord, but rather that (if it does not resolve) it is not like any of those that appear in the system.¹⁶¹

For Schenker, not only must music (if it is to be great music) always

conform to neutral standards required by the nature of sound and art, but the

listener must (in order to hear music properly) listen in a way that conforms to the

standards he prescribes. Nicholas Cook describes this aspect of Schenkerian

theory:

Such was Schenker's position. . . . [He maintained] that the purpose of analysis is not to reflect how people listen to music, but to explain how they *ought* to. Schenker was reacting against what he saw as a decline in Western music culture, a decline that stemmed from a failure of hearing.¹⁶²

Schoenberg, as we have seen, held the contrary view. He repeatedly affirmed that the traditional theory of harmony offers only a "way of speaking" about harmonic practice and phenomena, rather than any kind of eternal truth. We

¹⁵⁹ "Further Considerations of the Urlinie: II," 9.

¹⁶⁰ Ibid., 12.

¹⁶¹ Theory of Harmony, 323.

¹⁶² Cook, "Music Theory and 'Good Comparison," 123. (Emphasis added.)

can think of this position as Schoenberg's *conventionalism*. I will return to a discussion of philosophical conventionalism in chapter 4.¹⁶³

Despite these fundamental differences in approach, Schoenberg continued to hold Schenker in high esteem, describing him as one of the "great line of Viennese teachers and theorists."¹⁶⁴ In the chordal-dissonance debate, Schoenberg seems to have been consciously overstating his case, for rhetorical purposes, in order to insist upon aesthetic relativism in harmonic theory.¹⁶⁵ On the one hand, we have seen that he does not categorically reject all of the universal and synthetic propositions of traditional harmonic theory. On the other hand, he cannot countenance the notion of neutral standards (i.e., aesthetic universals). He is a champion of artistic freedom who insists that the artist must be unfettered, the artwork autonomous.¹⁶⁶ As we have seen, more than anything Schoenberg writes about the employment of dissonance itself, *this* is the central tension that exists in Schoenberg's harmonic and aesthetic theories.

¹⁶³ See p. 122, below.

¹⁶⁵ Andrew Anderson describes Schoenberg's employment of "diatribal rhetoric" in his *Harmonielehre* chapter on 'Non-Harmonic Tones' ("Why is Schoenberg's Seventeenth Chapter so Hard to Digest?" *Indiana Theory Review*, 15/2 [Fall 1994], 1–16).

¹⁶⁶ Christopher Hailey, "Musical Expressionism: The Search for Autonomy," In *Expressionism Reassessed*, ed. Shulamith Behr, David Fanning and Douglas Jarman (Manchester and New York: Manchester University Press, 1993), 103–11.

¹⁶⁴ During the last year of his life, Schoenberg wrote of "the great line of Viennese teachers and theorists: the line of Porpora, Fux, Albrechtsberger, Sechter, Bruckner and Schenker" ("Bach [1950]," in *Style and Idea*, 532).

The idea that Schoenberg rejected harmonic universalism in favour of a thoroughgoing relativism is one that has gained much currency during the twentieth century, both among Schoenberg's critics and his disciples.¹⁶⁷ On the evidence that we have seen, this appears to be a "mismeme,"¹⁶⁸ a misrepresentation of Schoenberg's view. It fails to account for the delicate balance that he maintains, throughout his theoretical writings, between a defense of the "facts" of harmonic theory and a dismissal of any kind of foundational aesthetic imperatives that purport to dictate the artistic ends toward which those facts must be employed.

In the next two chapters, I will explore Schoenberg's position in more detail. I will also examine how the epistemological revolution which Schoenberg proclaimed in music theory bears a striking similarity to a concurrent revolution in general philosophy, one that was unfolding in Schoenberg's immediate intellectual milieu, and that grew out of the same ideological soil.

¹⁶⁷ In chapter 4, we will see how composer-theorists such as Milton Babbitt and Benjamin Boretz, and musicologists such as Rose Subotnik, may have contributed to the promulgation of this view.

¹⁶⁸ Neurologist Richard Bergland coins the neologism "mismeme" to refer to mistaken ideas passed down through history as unchallenged fact, often because of the respect felt for their authors (*The Fabric of Mind* [New York: Viking, 1985]).

Chapter 3: Schoenberg and Wittgenstein: Positivism and the Limits of Language

Ludwig Wittgenstein has been widely hailed as a revolutionary and influential thinker whose ideas have "shaped the twentieth century" in many respects.¹⁶⁹ While it may be possible to identify sweeping implications of Wittgenstein's thought for music theory in general, my focus in the present chapter will be more modest and delimited. I will compare some of the central tenets of Wittgenstein's early thought to related ideas in Schoenberg's writings. My scope will be restricted to the years 1910 to 1940, a period of immense upheaval and revolution in both music theory and philosophy.

Wittgenstein and Schoenberg had so much in common that it seems natural to look for correspondences between their ideas. First and foremost they were Austrian compatriots, participants in the tumultuous intellectual and cultural milieu that was Vienna during the early years of the twentieth century.¹⁷⁰

¹⁶⁹ Daniel Dennett, "Ludwig Wittgenstein," in *People of the Century: One Hundred Men and Women Who Shaped the Last One Hundred Years* (New York: Simon & Schuster, 1999), 145–50. Edmonds and Eidinow note that "a poll of professional philosphers in 1998 put him fifth in a list of those who had made the most important contributions to the subject, after Aristotle, Plato, Kant and Nietzsche and ahead of Hume and Descartes" (*Wittgenstein's Poker* [London: Faber and Faber, 2001], 231).

¹⁷⁰ Numerous commentators have suggested that the multiple revolutionary trends which intersect in early twentieth-century Vienna were stimulated by upheavals of an economic and socio-political nature. The political disintegration of post-Imperial Vienna did not prevent it from remaining a centre of intellectual vigour. On the contrary, Vienna's political turmoil and multiethnicity seemed to stimulate a desire among its intelligentsia to put forward new and radical ideas of durable worth, as seen in the work of Freud, Adler, Loos, Einstein, Wittgenstein, Schoenberg and the logical positivists of the Vienna Circle. Karl Popper points in particular to the important role that multi-ethnicity and clashing cultures have played in fostering important and revolutionary developments in the history of ideas (*The Myth of the Framework*, 38–39). See also Allan Janik and Stephen Toulmin, *Wittgenstein's Vienna* (New York: Simon & Schuster, 1973); Carl

Both were centrally preoccupied with logic and epistemology, Schoenberg as they pertain to music theory and aesthetics, Wittgenstein concerning language and philosophy. Both cited Schopenhauer as the ultimate source of many of their most central ideas, at least in spirit and inspiration.¹⁷¹ The Viennese anti-war polemicist Karl Kraus – whose periodical *Die Fackel (The Torch)* gave new focus to questions involving the ethics of language – was a mentor and formative influence for both Schoenberg¹⁷² and Wittgenstein.¹⁷³ It could be said of

¹⁷¹ Schopenhauer's influence on Wittgenstein's early thought (i.e., on the *Tractatus*) has been traced in Allan S. Janik, "Schopenhauer and the Early Wittgenstein," chap. 2 in *Essays on Wittgenstein and Weininger* (Amsterdam: Rodopi, 1985). See also David A. Weiner, *Genius and Talent: Schopenhauer's Influence in Wittgenstein's Early Philosophy* (London and Toronto: Associated University Presses, 1992). Schopenhauer's influence on Schoenberg is described in Pamela C. White "Schoenberg and Schopenhauer," *Journal of the Arnold Schoenberg Institute*, 8/1 (June, 1984): 39–57; idem., *Schoenberg and the God-Idea: The Opera Moses and Aron* (Ann Arbor: UMI Research Press, 1985), 67–76.

¹⁷² Kraus was centrally concerned with the exposure of the abuse of language that is associated with propaganda of various kinds. His writings exerted an inestimable influence on the intelligentsia of turn-of-the-century Vienna, a city he described as "the research laboratory for world destruction" (Monk, *Ludwig Wittgenstein: The Duty of Genius* [New York: Free Press, 1990],
9). Schoenberg frequently expresses admiration for Kraus, citing him twice in *Theory of Harmony* (pp. 404, 415) and twice in *Style and Idea* (pp. 144, 369). Elsewhere he wrote: "In the dedication of a copy of my *Harmonielehre* which I sent to Karl Kraus, I said, I have perhaps learned more from you than one is permitted to learn if one wishes to remain independent" (Schoenberg, "Karl Kraus" [1913] *Schöpferische Konfessionen*, ed. Willi Reich [Zurich: Verlag der Arche, 1964], 21). See the section titled "Schoenberg and Karl Kraus" in White, *Schoenberg and the God-Idea*, 76–81. See also Alexander Goehr, "Schoenberg and Karl Kraus: the Idea Behind the Music," *Music Analysis*, 4:1/2 (1985): 59–71; Alan Lessem, "Schoenberg and the Crisis of Expressionism," *Music and Letters*, 55/4 (1974): 429–36.

¹⁷³ In 1931, Wittgenstein writes: "I don't believe I have ever invented a line of thinking. I have always taken one over from someone else. I have simply straightaway seized on it with enthusiasm for my work of clarification. That is how Boltzmann, Hertz, Schopenhauer, Frege, Russell, Kraus, Loos, Weininger, Spengler, Staffa have influenced me" (*Culture and Value*, ed. G.

E. Schorske, *Fin-de-Siècle Vienna: Politics and Culture* (New York: Vintage Books, 1981); Thomas Harrison, 1910: *The Emancipation of Dissonance* (Berkeley & Los Angeles: University of California Press, 1996); Massimo Cacciari, *Posthumous People: Vienna at the Turning Point* (Palo Alto, California: Stanford University Press, 1979); William M. Johnston, *The Austrian Mind: An Intellectual and Social History*, 1848-1938 (Berkeley and Los Angeles: University of California Press, 1972).
Schoenberg, as it was of Wittgenstein, that he "admired Karl Kraus as he admired no other writer of his time."¹⁷⁴ Schoenberg, a largely self-taught composertheorist,¹⁷⁵ held academic "theoreticians" in contempt.¹⁷⁶ Wittgenstein, a largely self-taught philosopher,¹⁷⁷ also held academic philosophers in contempt.¹⁷⁸ Both had extensive contact and correspondence with the celebrated Viennese architect Adolf Loos.¹⁷⁹ Both felt that knowledge was intimately connected with doing

H. von Wright, trans. Peter Winch [Chicago: University of Chicago Press, 1980], 19). Monk's biography gives an account of Wittgenstein's relationship with Kraus (*Ludwig Wittgenstein*, 16–20). See also Werner Kraft, "Ludwig Wittgenstein und Karl Kraus: Direkt und Indirect," in *Untersuchungen zum Brenner*, ed. Walther Methagl (Salzburg: Mueller, 1981).

¹⁷⁴ M. O'C Drury, "Ludwig Wittgenstein Symposium (II): Assessments of the Man and the Philosopher," *The Listener*, 63 (January 28, 1960): 163.

¹⁷⁵ "I have not learned by reading but by thinking" (*Style and Idea*, 532). "I am no scholar, I am self-taught and can only think . . . I have never yet read a history of music" (*Theory of Harmony*, 66).

¹⁷⁶ "The usual music theorist has no practical skill at all – he is no master . . . The theorist, who is not usually an artist, or is a bad one (which means the same), understandably takes pains to fortify his unnatural position . . . To hell with all these theories, if they always serve only to block the evolution of art and if their positive achievement consists in nothing more than helping those who will compose badly anyway to learn it quickly" (*Theory of Harmony*, 7–9).

¹⁷⁷ "[Wittgenstein] was not learned or widely read, but would only read what he could wholeheartedly assimilate" (John Heaton and Judy Groves, *Introducing Wittgenstein* [Cambridge: Icon Books, 1999], 80).

¹⁷⁸ "Wittgenstein hated professional philosophy" (David Pears, *Ludwig Wittgenstein* [New York: Penguin, 1977], 35). "He had an abhorrence of academic life in general and of the life of a professional philosopher in particular. He believed that a normal human being could not be a university teacher and also an honest and serious person . . . Wittgenstein several times renewed the attempt to persuade me to give up philosophy as a profession. He commonly did this with other students" (Norman Malcolm, *Ludwig Wittgenstein: A Memoir* [Oxford: Oxford University Press, 1966], 28–30).

¹⁷⁹ Correspondence listed in the Arnold Schoenberg archives includes nineteen letters exchanged between Schoenberg and Loos (and another thirteen letters exchanged between Schoenberg and Loos's wife, Claire) between 1927 and 1931 alone. Loos is also reported to have felt a strong kinship with Wittgenstein. On one occasion he apparently stated to Wittgenstein: "You are me!"

and acting rather than with theorizing, and both shared the Viennese penchant for seriousness of purpose and aversion to superfluity.¹⁸⁰

Like Schoenberg's theory, Wittgenstein's philosophy is a strange product of genius that differs in many ways from the work of his contemporaries and predecessors. We will see how the writings of Schoenberg and the early Wittgenstein are landmark documents that endorse a radical rejection of the foundations upon which their respective disciplines had rested for centuries. They mark a decisive epistemological turning-point, offering a renewal of ideas and a new conceptual framework that is seen to emerge from the ashes of an old world laid waste by out-moded thinking. Both made similarly grandiose claims regarding the scope and import of their ideas, Schoenberg claiming that he had "shown mankind the way for musical creativity for at least the next one hundred years,"¹⁸¹ Wittgenstein confidently asserting that he had "found, on all essential points, the final solution of the problems [of philosophy]."¹⁸² Both Schoenberg

(cited in Engelmann, *Letters*, 127). Paul Engelmann, Wittgenstein's close friend, correspondent. and biographer, studied architecture with Loos.

¹⁸⁰ The tendency to "cut to the bone" is perhaps more characteristic of Schoenberg's music than of his theoretical writings. Commentators have unanimously remarked upon the density and austerity of Wittgenstein's *Tractatus*. Janik and Toulmin point out that the Viennese predilection for concision is also manifest in the anti-ornamental aesthetic of Viennese architects Adolf Loos and Walther Gropius, and in the desire of both Karl Kraus and the Vienna positivists to "jettison the ballast" and "remove the clutter" in the use of language (*Wittgenstein's Vienna*, 214, 252).

¹⁸¹ From a letter to Claire Loos, dated December 17, 1930 (cited in E. Randol Schoenberg, "Arnold Schoenberg and Albert Einstein: Their Relationship and Views on Zionism," *Journal of the Arnold Schoenberg Institute*, 10/2 [November, 1987]: 161). See fn. 179, above, regarding Schoenberg's correspondence with Adolf and Claire Loos.

¹⁸² Tractatus Logico-Philosophicus, 5 (preface).

and Wittgenstein had commanding personalities that inspired almost sycophantic devotion among their students. It could be said of Schoenberg, as it was of Wittgenstein, that "the magic of his personality and style was infectious, and pupils tended to imitate him, causing him much pain, as he valued independent thinking above all,"¹⁸³ and that "most of those who loved him and had his friendship also feared him."¹⁸⁴ Both favoured the restoration of the Austrian Monarchy,¹⁸⁵ yet both showed leftist sympathies. Schoenberg was a Jew who converted to Christianity in 1898 and reverted to Judaism in 1933. Wittgenstein was a nominal Christian of Jewish ancestry.¹⁸⁶ Both feared, and were repulsed by, Nazi persecution of European Jews. Schoenberg fled to the United States, Wittgenstein to England.

Sharing so many common interests and so much common heritage and temperament, it seems impossible to imagine that two such prominent Viennese

¹⁸⁴ Malcolm, Ludwig Wittgenstein: A Memoir, 36.

¹⁸³ Heaton and Groves, *Introducing Wittgenstein*, 80. Schoenberg likewise viewed the proliferation of a new atonal "school" as a violation of everything he stood for. "Damn it all!" he exclaimed in a 1922 letter to Wassily Kandinsky, "I did my composing without any 'isms' in mind. What has this got to do with me?" (Jalina Hahl-Koch, ed. *Arnold Schoenberg – Vassily Kandinsky: Letters, Pictures and Documents*, trans. John C. Crawford [London: Faber and Faber, 1984], 74).

¹⁸⁵ "My Attitude Toward Politics [1950]," in *Style and Idea*, 505–6. "Wittgenstein fought in World War I and continued to wear his uniform for many years after the war, as though it, and mourning for the loss of the Austro-Hungarian empire, had become part of his identity" (Monk, *Ludwig Wittgenstein*, 170)

¹⁸⁶ Conversion to Christianity was common among nineteenth- and early twentieth-century Viennese Jewry. Wittgenstein's paternal grandfather had converted from Judaism to Lutheranism, and his father had converted to Catholicism only in order to marry Wittgenstein's Catholic mother. Wittgenstein was baptized Catholic as a child but never embraced the Catholic faith.

intellectuals did not know one another. There is, however, no documented evidence of any kind to suggest that Schoenberg and Wittgenstein ever met or corresponded. In fact, although the contents of Schoenberg's personal library reveal something of his philosophical interests and inclinations,¹⁸⁷ little is known about any association he may have had with Vienna's philosophical circles.¹⁸⁸ Though a number of off-hand remarks sprinkled throughout his writings suggest that Schoenberg had at least a peripheral familiarity with the premises of analytic philosophy,¹⁸⁹ the works of Wittgenstein and the Vienna Circle are conspicuously absent from his personal library, and there is no evidence that Schoenberg ever directly investigated analytic philosophy or logical positivism, although it was being developed virtually in his own backyard.¹⁹⁰

¹⁸⁷ Schoenberg's personal library included a wide range of Greek philosophy, practically everything by Kant and Schopenhauer, several works of Nietzsche, nothing by Hegel (!), a sampling of books by Feuerbach and Bergson, and nothing by Wittgenstein. See White, "Schoenberg and Schopenhauer," 44.

¹⁸⁸ Schoenberg mentions contact with his longtime friend David Bach, "a linguist, a philosopher, a connoisseur of literature, and a mathematician, he was also a good musician" (*Style and Idea*, 80), and with Dr. Robert Neumann, a composition student and "a young philosopher whose keen understanding makes me extremely curious about his own work" (*Theory of Harmony*, 384). A letter of tribute to Schoenberg by Neumann is published in *Arnold Schoenberg* (Munich: Piper Verlag, 1912), and reprinted in translation in Walter Frisch, *Schoenberg and His* World (Princeton: Princeton University Press, 1999), 254. Eight letters from Robert Neumann to Schoenberg are archived at the Arnold Schoenberg Institute, six dated 1911 (no correspondence from Schoenberg to Neumann is found in the archive database). Frisch observes in a footnote: "I have been unable to identify Neumann definitively . . . He may be the Robert Neumann who completed a dissertation on Goethe and Fichte at the University of Jena in 1904, and who, in 1911, the year Schoenberg published *Harmonielehre*, published a book on Herder."

¹⁸⁹ Schoenberg frequently cites aphorisms from Karl Kraus about the centrality of language. For example: "Karl Kraus calls language the 'mother of thought . . . 'Language, mother of the idea,' says Karl Kraus" (*Style and Idea*, 144, 369).

¹⁹⁰ White, "Schoenberg and Schopenhauer," 45.

Some additional biographical facts may suggest an explanation. Firstly, Schoenberg and Wittgenstein belonged to successive generations: Schoenberg was Wittgenstein's elder by fifteen years (though both died in 1951).¹⁹¹ Furthermore, during the tumultuous period of 1908 to 1913, when Schoenberg's star (or rather infamy, perhaps) was rising in Vienna, Wittgenstein was spending his formative years in England at Trinity College, Cambridge, under the tutelage of Bertrand Russell.¹⁹² Although he spent the inter-war years largely in Vienna, Wittgenstein was somewhat reclusive, tending to avoid interaction with Viennese society and intelligentsia (even the members of the Vienna Circle had difficulty arranging to meet with him during this period).¹⁹³ Furthermore, whereas Wittgenstein had received an education befitting the European elite, Schoenberg

¹⁹² Wittgenstein's Cambridge years followed a brief period of engineering study at the University of Manchester.

¹⁹³ Monk, Ludwig Wittgenstein, 242.

¹⁹¹ Schoenberg was forty-five years old when World War I ended in 1918; Wittgenstein was thirty. Since Wittgenstein was a contemporary of Webern and Berg, it is perhaps more likely that he had contact with them than with Schoenberg himself. It should be noted, however, that Schoenberg seems to have been on better terms with the younger generation than with his peers. He wrote: "In Vienna there will always be a few righteous men (a few twenty-year-olds with the detachment and composure of men of sixty, able to divert their braver impulses into the grooves of caution and sweet reason), but they will have to keep on terms with the unrighteous (a few men of forty, as unreliable as fourteen-year-old school-children, as mischievous, with as defective a sense of responsibility, and as lacking in respect for things they are incapable of understanding)" ("About Music Criticism [1909]," in Style and Idea, 197). A number of points of intersection can be identified between Wittgenstein and Schoenberg's students. For example, we know that Wittgenstein and Webern shared a passion for the poetry of Georg Trakl. The last of Webern's four songs published as Opus 13, and the Six Songs for Soprano and Four Instruments, Opus 14 (1917-21) are settings of Trakl's poetry. Trakl was also one of the poets (Rilke was another) among whom Wittgenstein divided a large portion of his inheritance in 1913. In the winter of 1914, Wittgenstein received a note from Trakl, urgently requesting a visit in Krakow where he been admitted to a psychiatric hospital. Wittgenstein rushed to his side, but by the time he arrived, Trakl had committed suicide from a cocaine overdose (Monk, Ludwig Wittgenstein, 108-19).

had failed to attain even Gymnasium certification (*Arbitur*).¹⁹⁴ And while Schoenberg was living in near-crippling poverty,¹⁹⁵ the family of one of Vienna's most affluent industrialists resided in the opulence of the "Palais Wittgenstein," on the elegant Alleegasse. In the words of biographer Ray Monk, the Wittgenstein's were "the Austrian equivalent of the Krupps, the Carnegies, or the Rothschilds."¹⁹⁶

The extraordinary story of Karl Wittgenstein's rise to prominence as an Austrian steel magnate has been well documented.¹⁹⁷ Due in part to the inclinations of his highly cultured wife Leopoldine, the "Iron King of Vienna" (as Karl Wittgenstein was known) became an important patron of the arts, and of music in particular.¹⁹⁸ While he cultivated a taste for contemporary art, however,

¹⁹⁶ Monk, Ludwig Wittgenstein, 7.

¹⁹⁷ Jorn K. Bramann and John Moran, "Karl Wittgenstein: Business Tycoon and Art Patron," *Austrian History Yearbook*, 15-16 (1979-80): 107-27.

¹⁹⁴ In notebook 2 of an unpublished manuscript for a biography of Schoenberg (archived at the Arnold Schoenberg Institute), Felix Greissle writes: "Schoenberg, who like Thomas Mann and Bertolt Brecht had no Gymnasium certification (*Arbitur*), was always pleased when he had time to enrich his knowledge." Griessle's manuscript is briefly described in R. Wayne Shoaf, "From the Archives: The Felix Greissle Collection," *Journal of the Arnold Schoenberg Institute*, 10 (1987): 80–81.

¹⁹⁵ In 1910, Schoenberg had to borrow from Mahler to pay his rent, and in 1911 Berg launched an appeal in support of Schoenberg, which was answered by Richard Strauss, among others. See *The New Grove Dictionary of Music*, s.v. "Schoenberg," 703–4.

¹⁹⁸ Bruno Walter wrote: "Karl Wittgenstein was greatly interested in contemporary art. Kleiger's sculpture of *Beethoven* had found its way to his home from the Secession Exhibition. Gustav Klimt, among other modern painters, was prominently represented in one of the rooms . . . The Wittgenstein house was frequented by musicians as well as by prominent painters and sculptors" (*Theme and Variations* [New York: Knopf, 1946], 168).

his musical tastes seem to have been more reactionary,¹⁹⁹ and his children inherited the family tendency toward conservatism in musical matters.²⁰⁰ Ludwig had a profound distaste for what he called "modern music." Indeed music did not have to be very modern to be deprecated by Wittgenstein. The depth of his reverence for the great lineage of Viennese composers of the eighteenth and nineteenth centuries – Mozart, Beethoven, Schubert and Brahms²⁰¹ – was equaled only by his distaste for the those of the twentieth: not only Schoenberg, but Mahler and Strauss among others.²⁰² It seems that, in

²⁰⁰ Several of Wittgenstein's brothers and sisters were artists and musicians. Violinist Joseph Joachim was a cousin. Wittgenstein's brother Paul was a gifted concert pianist who lost his right arm in the First World War. His repertoire and style of pianism were in the nineteenth-century mold, but he commissioned works for piano left-hand by Strauss, Ravel, Britten and Prokofiev and he "worked hard at trying to assimilate the twentieth-century styles . . . with the exception of Schoenberg's atonalism" (E. Fred Flindell, "Paul Wittgenstein (1887-1961): Patron and Pianist," 119).

²⁰¹ Wittgenstein added another name to his list of great Viennese composers, that of the blind Viennese organist and composer Josef Labor. Monk reports that he was fond of saying that there had been just six great composers: "Haydn, Mozart, Beethoven, Schubert, Brahms – and Labor" (*Ludwig Wittgenstein*, 8). Labor was the beneficiary of considerable patronage from the Wittgenstein family, and Wittgenstein tried to encourage the performance of his music at Cambridge (*Ludwig Wittgenstein*, 78). Schoenberg also knew and admired Labor, from whom he had received some encouragement and instruction, and to whom he submitted a movement from a String Quartet in C in 1894 (which was never published). See *The New Grove Dictionary of Music*, s.v. "Schoenberg," 702.

²⁰² Wittgenstein's distaste for contemporary music was widely known amongst his friends and associates. In diary entries dated February 28, 1913, and May 24, 1913, David Pinsent writes: "Wittgenstein and Lindley came to tea: there was a lot of animated discussion about modern music – Lindley defending it against us two." "I came with him to his rooms. Soon afterwards

¹⁹⁹ Monk, *Ludwig Wittgenstein*, 13. It should be noted, however, that Flindell's surprising assertion that "Karl [Wittgenstein] lent aid to Schoenberg," seems somewhat at odds with Monk's account of Karl Wittgenstein's musical tastes (E. Fred Flindell, "Paul Wittgenstein (1887-1961): Patron and Pianist," *The Music Review*, 32 [1971], 110). In support of his claim, Flindell cites documentation of Karl Wittgenstein's relationships with "the musically great," provided in his book *Ursprung und Geschichte*.

matters of musical taste at least, Wittgenstein may have been precisely the sort of arrogant, conservative, and narrow-minded Viennese "philistine" that Schoenberg denigrates so often in his writings.²⁰³ Further, like Karl Kraus, "Schoenberg had come to revile the self-delusion of most urban Jews who assumed that the mere acquisition of wealth and culture was a sufficient basis for a sense of security."²⁰⁴ Ludwig Wittgenstein's family could surely have been held up as the very model of the sort of fully-assimilated Viennese Jewry to which Schoenberg and Kraus allude. In short, although they had a great deal in common, we might suppose that the circumstantial, socio-economic, and musicaesthetic gulf between Schoenberg and Wittgenstein would have caused them to avoid interaction even if they *hud* chanced to find themselves in common company.

Still, neither Wittgenstein's distaste for contemporary music nor the lack of evidence concerning contact between the two need dissuade us from what I will argue is the inescapable conclusion that central aspects Wittgenstein's philosophy and Schoenberg's aesthetic can be understood as two facets of the same epistemological outlook. I will now examine the relationship between the

one MacClure turned up – a music undergraduate – and there was a wild discussion on modern music – MacClure against Wittgenstein and myself" (cited in Monk, *Ludwig Wittgenstein*, 78).

²⁰³ For example, see Schoenberg, "About Music Criticism [1909]," in *Style and Idea*, 191–97.

²⁰⁴ Leon Botstein, "Schoenberg and the Audience: Modernism, Music, and Politics in the Twentieth Century," in *Schoenberg and His World*, ed. Walter Frisch (Princeton: Princeton University Press, 1999), 44. See also Monk, *Ludwig Wittgenstein*, 315.

ideas of Wittgenstein and Schoenberg. In my discussion I will conveniently sidestep some of the more controversial nuances of the epistemological framework outlined in Wittgenstein's *Tractatus*, in order to focus squarely on its most fundamental tenets. It will be important to bear in mind that we are concerned here with documenting aspects of early twentieth-century thought that intersect in Wittgenstein's philosophy and Schoenberg's music-theoretical epistemology, rather than with the epistemological positions *per se*. My purpose is not to test the truth or validity of Wittgenstein's arguments and propositions, but to state them as clearly and concisely as possible, to examine their relationship to issues of music theory, aesthetics, and discourse, and to compare them to some of the propositional underpinnings of Schoenberg's epistemology.

LANGUAGE AND KNOWLEDGE: ANALYTIC PHILOSOPHY AND THE VIENNA CIRCLE

Since musicologists may not be acquainted with the works and problems of analytic philosophy, I will begin by reviewing some background in order to establish a framework for my discussion. In chapter 2 we saw that, since Kant, idealists have refuted the realist's contention that reality and truth exist external to the mind. In the twentieth-century, philosophers went even further, affirming that reality and truth are not only constructs of the mind, they are constructs unique to *language*. A new and intense preoccupation with language has been

72

one of the defining characteristics of twentieth-century philosophy.²⁰⁵ By the turn of the century, philosophy had largely shifted its focus of analysis away from ideas in the mind to the language in which thinking is expressed. To the question, "What permits meaningful thinking?" Russell, Moore, Carnap, and Wittgenstein, replied, each in his own way, "the logic and structure of language." This idea, which most clearly distinguishes early twentieth-century thought from prior traditions, defined the approach that became known as "analytic philosophy."²⁰⁶

The analytic philosopher's task was to dissect ordinary language systematically, in order to expose the hidden laws that govern its operations. It was one of the basic convictions of all early analytic philosophers that the

²⁰⁵ It should be noted that it is only the methods and concepts that are employed in the analysis of language that are new in the twentieth century. The general appreciation for the intimate link between language, reason, and knowledge dates from the ancient Greeks. The theme of the centrality of language was also resurrected in the eighteenth century by anti-Enlightenment philosophers such as Johann Georg Hamann. Hamann tried to draw the attention of the rationalists to their tendency to overlook the role of language. "All idle talk about reason is mere wind . . . Not only does the entire capacity to think rest on language, but language is also the centre of the misunderstanding of reason with itself. Reason is invisible without language" ("Metacritique of the Purism of Reason," in *J. G. Hamann: Sämtliche Werke*, vol. 3 [Vienna, 1949], 286). Cited in James C. O'Flaherty, Introduction to *Socratic Memorobilia* by J. G. Hamann, ed. and trans. James C. O'Flaherty (Baltimore: Johns Hopkins Press, 1967), 39-40. See also Isaiah Berlin, *The Magus of the North: Johann Georg Hamann and the Origins of Modern Irrationalism* (New York: Farrar, 1993).

²⁰⁶ Saussure also concentrates on language and attempts to analyze linguistic expression and conceptualization. It can be difficult, therefore, to distinguish analytic philosophy from aspects of Saussure's linguistic "structuralism." The focus of analytic philosophy is more squarely on the nature of the logical structure of language. Unlike analytic philosophy, Saussure's approach is one which can be applied more broadly to the "structures" of other domains (e.g., culture, society, music, etc.) wherein elemental components are related to one another in some coherent way. See Georges Mounin, *Saussure ou le structuralisme sans le savoir* (Paris: Segher, 1968).

underlying logical structure of language was deeply hidden beneath the external variety of linguistic forms. They sought therefore to identify the universal logical structure of language without referring to historical evolution, individual languages, or individual utterances. Practitioners of analytic philosophy were determined to uncover logical, axiomatic, closed, and internally-coherent structures underlying language comparable to those upon which mathematics rested.

Although there was broad agreement among analytic philosophers concerning the general orientation of the approach, "analytic philosophy" meant subtly different things to each of them. For the mathematician-logician Bertrand Russell (1872-1970), the aim of analytic philosophy was to translate grammatically misleading statements into logically correct forms.²⁰⁷ For George E. Moore (1873-1958), analytic philosophy does not discover facts about the world – which are real in themselves in accordance with our "common sense" perception of them – but rather it defines and clarifies concepts and their expression.²⁰⁸ For Rudolf Carnap (1891-1970), analytic philosophy is the systematic uncovering of the logical

²⁰⁷ Bertrand Russell, Logic and Knowledge, ed. R. Marsh (London: Allen, 1956).

²⁰⁸ George E. Moore, "A Defence of Common Sense," in *Contemporary British Philosophy: Personal Statements, Second Series*, ed. H. D. Lewis (London: Allen, 1925), 193-223; idem, "The Refutation of Idealism," *Mind*, 12 (1903); reprinted in *The Idealist Tradition*, ed. A. Ewing (Glencoe, Ill.: Free Press, 1957), 289–310; idem, *Commonplace Book*, ed. C. Lewy (London: Allen, 1962).

conceptual syntax of language, especially that of the language of science.²⁰⁹ For Ludwig Wittgenstein, analytic philosophy enlightens us concerning what *can* and *cannot* be legitimately *said*, and how "what can be said at all, can be said clearly."²¹⁰ Wittgenstein's landmark treatise, *Tractatus Logico-Philosophicus*, gave impetus to the analytic movement in philosophy. The *Tractatus* is a pivotal document in the moment in intellectual history that is sometimes known as "the linguistic turn,"²¹¹ from and around which much later twentieth-century philosophy radiates.

The Vienna Circle first met in a Vienna café in 1910,²¹² but they did not become known to the wider public until the 1929 publication of a manifesto entitled "The Scientific Conception of the World."²¹³ The common project of the group—led by Moritz Schlick and including Rudolf Carnap, Hans Hahn, Otto Neurath, Frank Ramsey, Herbert Feigl, Friedrich Waismann, and Kurt Gödel among its membership²¹⁴—was to explore the logical foundations of science, toward which they shared a common orientation. The label that has been attached

²⁰⁹ Rudolf Carnap, *The Logical Syntax of Language* [Logische Syntax der Sprache, 1934], trans. Amethe Smeaton (London: Routledge, 1949).

²¹⁰ Tractatus Logico-Philosophicus, proposition 4.116.

²¹¹ Richard Rorty, ed. *The Linguistic Turn* (Chicago: University of Chicago Press, 1975), 54–62. See also chapter 2 ("The Linguistic Turn") in Michael Dummett, *Origins of Analytical Philosophy* (London: Duckworth, 1993), 4–14.

²¹² Harrison, 1910: The Emancipation of Dissonance, 68.

²¹³ Hahn, Neurath, and Carnap, "The Scientific Conception of the World." In the same year, the first in a series of congresses organized by the group took place in Prague.

²¹⁴ More peripherally-involved members of the circle included Hempel, Quine, Popper, and Ayer.

to their conception of knowledge is "logical positivism," "neo-positivism," or "logical empiricism."²¹⁵ What distinguished the logical positivism of the Vienna Circle from the positivism of the nineteenth century was their method, which was largely defined in terms of the logical analysis of language inherited from analytic philosophy. They viewed the conceptual foundations of science largely in terms of internally-coherent logical systems, or conventions, of language. According to this view, since knowledge is based on the capacity for designation and representation afforded by language, the analysis of knowledge must be performed by means of linguistic analysis.²¹⁶ For the Vienna Circle, there were only two sources of knowledge, empirical experience (captured in synthetic propositions) and logical reasoning about it (captured in analytic propositions):

The language of a theory includes two kinds of terms: observational and theoretical. [Accordingly] the statements of a theory are divided in two groups: synthetic and analytic. Observational [synthetic] terms denote objects or properties that can be directly observed or measured while theoretical [analytic] terms cannot be observed or measured. Synthetic statements depend on experience, and their truth can be acknowledged only by means of experience. Analytic statements are *a priori* and their truth is based on the rules of the

²¹⁶ Kraft, The Vienna Circle, 191.

²¹⁵ Victor Kraft explains that "logical empiricism" was the term favoured by the Circle's leading members Schlick and Carnap, since the term *logical positivism* "suggested too close an affiliation with [the positivism of] Comte and Mach," though, as Kraft notes, the Circle's departure from the traditional tenets of the older *empiricism* are no less significant" For the Vienna Circle, "epistemology ... can be nothing else but the logical analysis of knowledge or the 'logic of science' as it came to be called in the Vienna Circle in order to make the positivism (i.e., their assertion that factual scientific knowledge was the only kind of knowledge possible) of their stance unmistakably clear" (Kraft, *The Vienna Circle*, 24–25). Karl Popper recalls that not all members of the Vienna Circle were committed positivists: "The Vienna Circle consisted of men of originality and of the highest intellectual and moral standards. Not all of them were positivists, even if we mean by this term no more than a condemnation of speculative thought, although most of them were" (*The Myth of the Framework*, 76f).

language. This conception of the structure of scientific reasoning and theories is perhaps the most durable philosophical principle of logical positivism.²¹⁷

It is impossible to overstate the impact that Wittgenstein's *Tractatus* had on the formulation of this view. The members of the Circle were unanimous in citing it as the seminal influence on the formation of their movement.²¹⁸ The *Tractatus* was subjected to close and repeated analysis in meetings of the Circle,²¹⁹ and a systematic exposition and clarifications of its ideas was planned as the first volume in the Circle's series of publications.²²⁰ Together with Russell and Einstein, Wittgenstein was named in the Circle's manifesto as a leading representative of their "scientific worldview" (*Wissenschaftliche Weltauffassung*).²²¹ Schlick hailed Wittgenstein's *Tractatus* as "an altogether decisive turning-point in philosophy."²²²

²¹⁹ "It was read out loud sentence by sentence twice, beginning in the Circle's Thursday meetings of 1926-27" (Rudolf Haller, "New Light on the Vienna Circle," *The Monist*, 65 [January, 1982], 27).

²²⁰ This summary never appeared, but Waismann later published a much-revised English translation under the title *The Principles of Linguistic Philosophy* (London: MacMillan, 1965).

²²¹ Hahn, Neurath, and Carnap, "The Scientific Conception of the World."

²¹⁷ Internet Encyclopedia of Philosophy, Online edition, 2001, s.v. "Logical Positivism."

²¹⁸ Baker, *Wittgenstein, Frege and the Vienna Circle*, 208. Kraft (*The Vienna Circle*, 1953) also notes that it is remarkable that the Circle did not assign that accolade to the field-defining book published by Schlick in 1918, *Allgemeine Erkenntnislehre (General Theory of Knowledge*, trans. Albert E. Blumberg [New York: Springer-Verlag, 1974]).

²²² Moritz Schlick, "Die Wende der Philosophie," in *Gesammelte Aufsatze* (Gerold, Vienna, 1938); reprinted and translated as "The Turning Point in Philosophy," in *Logical Positivism*, ed. A. J. Ayer, trans. David Rynin New York: Free Press, 1959), 53–59.

WITTGENSTEIN'S TRACTATUS

Wittgenstein's philosophy is difficult to summarize. Indeed, without the aid of the sizable secondary-literature that has been devoted to its interpretation, it can be difficult to understand.²²³ ("Sometimes a sentence can be understood only if it is read at the *right tempo*," Wittgenstein wrote. "My sentences are all supposed to be read *slowly*.")²²⁴ As if to further complicate matters, Wittgenstein's philosophy is presented chiefly in two distinctly contrasting treatises that are widely separated both in date of publication and conceptual framework. The first, the grandly-titled "*Tractatus Logico-Philosophicus*," was begun in 1915 following Wittgenstein's tenure at Cambridge under Russell's mentorship. A preliminary manuscript (the "*Prototractatus*") was prepared in 1917, ²²⁵ the final text was completed in 1918, and the treatise was finally published in German in 1921.²²⁶ A year later a definitive edition appeared, with facing English translations and an

224 Culture and Value, 57.

²²⁶ Ludwig Wittgenstein, "Logisch-Philosophische Abhandlung," Annalen der Naturphilosophie (1921).

²²³ Some scholars have raised a cautionary flag concerning the secondary literature on Wittgenstein, suggesting that the voluminous secondary literature has often contributed to a misinterpretation of Wittgenstein's essential thought, since it tends to draw the reader away from his original text. See John V. Canfield, ed. *Wittgenstein: Aesthetics, Ethics and Religion,* vol. 4 of *The Philosophy of Wittgenstein* (New York: Garland, 1986), iv; Andrew Lugg, *Wittgenstein's Investigations 1-133: A Guide to Interpretation* (London and New York: Routledge, 2000), 1–4.

²²⁵ Ludwig Wittgenstein, *Prototractatus: An Early Version of the Tractatus Logico-Philosophicus*, ed. B. F. McGuinness, T. Nyberg, and G. H. von Wright (London: Routledge, 1971). The importance of the *Prototractatus* lies in revealing the important changes that the treatise underwent—in particular the expansion and development of his ideas on ethics—during the early months of 1918, changes apparently inspired by Wittgenstein's experience in the trenches during the war. See also Georg Henrik von Wright, "The Origin of Wittgenstein's *Tractatus*," in *Wittgenstein: Sources and Perspectives* (Ithaca: Cornell University Press, 1979), 99–160.

introduction by Bertrand Russell.²²⁷ Wittgenstein's second treatise, the *Philosophical Investigations*, is a collection of philosophical notes and musings compiled toward the end of his life and published posthumously. I will be concerned almost exclusively with the early Wittgenstein (i.e., with the *Tractatus*). The elegant and dramatic conclusions of the *Tractatus* correspond more directly with Schoenberg's worldview than the elaborate analyses of the *Philosophical Investigations*.²²⁸ Furthermore, the publication and dissemination of the *Tractatus*, which had such an overwhelming influence on logical positivism (especially that of the Vienna Circle), occurred alongside pivotal developments in Schoenberg's theory and thought.²²⁹

²²⁷ Ludwig Wittgenstein, *Tractatus Logico-Philosophicus* [Logisch-Philosophische Abhandlung, 1921], trans. Frank Ramsey and Cecil K. Ogden (London: Routledge & Kegan Paul, 1922). The grand Latin title *Tractatus Logico-Philosophicus* was adopted for the first English translation at the suggestion of G. E. Moore (whose idea was inspired by Spinoza's *Tractatus Theologico-Politicus*). All passages from the *Tractatus* that are cited in this dissertation have been taken from the 1961 translation by D. F. Pears and B. F. McGuinness (London: Routledge and Kegan Paul, 1961).

²²⁸ So divergent is the conceptual framework presented in Wittgenstein's two important treatises that Bertrand Russell called the *Tractatus* "W1" and the *Philosophical Investigations* "W2." Russell considered W1 to be a work of genius, but he disparaged W2 in the strongest terms: "the later Wittgenstein seems to have grown tired of serious thinking and to have invented a doctrine which would make such an activity unnecessary" (cited in Norman Malcolm, "Ludwig Wittgenstein Symposium (III): Assessments of the Man and the Philosopher," *The Listener*, 63 [February 4, 1960]: 207). See also Ayer, *Wittgenstein*, 134.

²²⁹ Ethan Haimo, *Schoenberg's Serial Odyssey: The Evolution of His Twelve-Tone Method* (Oxford: Clarendon, 1990). Haimo chronicles Schoenberg's development of the twelve-tone method during this period. There is a remarkable coincidence – in time, spirit, and conceptual framework – between the publication of Wittgenstein's *Tractatus* (hailed as "the revolution of 1922" by the Vienna Circle), the unveiling of Schoenberg's theory (which might be called "the revolution of 1924-25"), and Einstein's theory, which Popper calls "the revolution of 1925-26" (*The Myth of the Framework*, 57).

The task Wittgenstein set for himself, when the *Tractatus* was first conceived in 1915, was to write a thorough and concise treatise on the foundations of logic, building upon groundwork in the foundations of mathematics and symbolic logic that had been laid by Gottlob Frege and Bertrand Russell.²³⁰ Wittgenstein's "project" was to identify the nature of language as an analytic system, one which has an internal logic, sets of axioms, and a structure that is largely analogous to mathematics. Though Wittgenstein's method of logico-linguistic analysis was not new, the systematic theory that he built around it in the *Tractatus*, and the great claims that he made for it, were. "The aim of the book," he asserts, is "to draw a limit to thought, or rather, not to thought, but to the expression of thought."231 For Wittgenstein, language amounts to a system of objective reference, where words name things from the world of experience, and the relations between them can be organized in a propositional grammar. The self-professed mission of the Tractatus was to prescribe the proper usage of language and to circumscribe the limits within which things can, and cannot, be legitimately described and *said*. The early

²³¹ *Tractatus Logico-Philosophicus*, 3 (preface).

80

²³⁰ Baker, *Wittgenstein, Frege and the Vienna Circle.* Wittgenstein acknowledged his deep indebtedness to both Frege and Russell in the preface of the *Tractatus*. By the time he first met Wittgenstein in 1911, Russell was exhausted from having recently completed his monumental *Principia Mathematica* (London: Geo. Allen & Unwin, 1908), and new interests were beginning to draw him away from the domain of mathematics and logic. He made a conscious decision to "pass the torch" in this domain to the young Wittgenstein (Monk, *Ludwig Wittgenstein*, 38-48, 72). Russell described Wittgenstein as "the most perfect example I have ever known of genius as traditionally conceived, passionate, profound, intense, and domineering," and eventually came to regard him as his superior as a logician (Bertrand Russell, *Autobiography* [Unwin, 1975], 329).

Wittgenstein can very tentatively be described as a logical *positivist* in the sense that he viewed language, when properly used, as a way of pointing to the facts of the world of experience, while at the same time distinguishing the formal logical necessities of language from this reality.²³² As for all non-scientific or pseudoscientific propositions, Wittgenstein considered them abuses of logic and language. Here he makes an important discrimination between falseness and nonsensicality, a distinction that is a hallmark of analytic philosophy and logical positivism in general.²³³ Unlike scientific propositions, for example, complex and problematic philosophical, theological, ethical, and aesthetic propositions cannot be refuted by mustering empirical evidence. Rather, when such propositions are subjected to logical analysis, they are found to rest upon a foundation of nonfalsifiable propositions. In this technical sense, the logical positivists therefore describe most philosophical, theological, ethical, and aesthetic propositions as cognitive "nonsense," logically incoherent pseudo-propositions, or simply "gibberish." Wittgenstein singled out traditional philosophy itself as a domain of intellectual endeavour in which nonsensical sentences had been produced in abundance. By exposing the pseudo-propositional nature of so much of the

²³² This characterization must be a highly qualified one, since the movement known as "logical positivism" came to be identified with a number of positions with which Wittgenstein would not have wished to associate himself (discussed below).

²³³ "If someone asserts 'there is a God,' 'the primary basis of the world is the unconscious,' or 'there is an entelechy which is the leading principle in the living organism,' we do not say 'what you say is false,' but we ask 'what do you mean by these statements?'" (Hahn, Neurath, and Carnap, "The Scientific Conception of the World," 306).

verbiage which buttresses philosophical discourse, he aimed "to turn latent nonsense into patent nonsense"²³⁴ and thereby to resist "the bewitchment of our intelligence by language."²³⁵

Wittgenstein asserts that many theories of traditional philosophy are demonstrably neither true nor false, but nonsensical, although they may look like intelligible statements at first glance:²³⁶

Most of the propositions and questions to be found in philosophical works are not false but nonsensical. Consequently we cannot give any answer to questions of this kind, but can only point out that they are nonsensical. Most of the propositions and questions of philosophers arise from our failure to understand the logic of language.²³⁷

Extending this conclusion to all non-scientific propositions, Wittgenstein's closes

the Tractatus with a dramatic and confident final proposition: "Whereof one

cannot speak, thereof one must be silent."238 This conclusion – widely hailed as a

²³⁸ Ludwig Wittgenstein, *Tractatus Logico-Philosophicus* [Logisch-Philosophische Abhandlung, 1921], trans. Frank Ramsey and Cecil K. Ogden (London: Routledge & Kegan Paul, 1922), proposition 7. I have departed here from my policy of adopting the Pears and McGuinness

²³⁴ Anthony Kenny remarks that this was a "well-known saying" of Wittgenstein ("Wittgenstein on the Nature of Philosophy," in *Wittgenstein and his Times*, ed. Brian McGuiness [Oxford: Blackwell, 1982], 3].

²³⁵ *Philosophical Investigations*, 109. This phrase captures what is arguably the singlemost important theme that resonates throughout all of Wittgenstein's philosophy.

²³⁶ The statement "there are oceans on the moon," is an example of a false proposition. The statement "the inflation rate is green," is an example of a nonsensical proposition. These distinctions are discussed in greater detail in chapter 4.

²³⁷ *Tractatus Logico-Philosophicus*, proposition 4.003. Ayer describes Wittgenstein's system for numbering the propositions in the *Tractatus* as follows: "The proposition number 3.001, for example, is a comment on proposition number 3 [i.e., 3.00], the propositions numbered 3.01, 3.02, 3.03 take the argument three small steps forward, 3.031 is a comment on 3.03, 3.031 makes a further advance, and so on. The main propositional headings run from 1 to 7. The German style is elegant but the plan of the book makes it very elliptical, justifying C. D. Broad's reference to 'the highly syncopated pipings of Herr Wittgenstein's flute''' (Ayer, *Wittgenstein*, 4).

rigorously pro-science and anti-metaphysics stance – had an overwhelming appeal within the emerging logical positivist movement.²³⁹

In his preface to the *Tractatus*, Wittgenstein had claimed that the treatise would be the "last word," the final and definitive solution and chapter in the history of philosophy. "I believe myself to have found," he affirmed, rather pompously at first blush, "the final solution of the problems [of philosophy]."²⁴⁰ He was convinced that he had shown that the seemingly complex questions of philosophy dissolve when the coherent logical rules of the analytic "system" underlying them (i.e., embodied in the language in which they are expressed) are understood. According to this view, most of the "problems" of philosophy either reduce to incoherent misuses of language, or they are tautologies within the closed analytic logical system that Wittgenstein identifies. (We will return to a more extended discussion of Wittgenstein's conception of logical tautology in chapter 4).

translation for use in this dissertation. They give the following translation of *Tractatus* proposition 7 : "What we cannot speak about we must pass over in silence." Not only does the Ogden and Ramsey translation seem more elegant and more familiar, I would argue that it more faithfully preserves the forceful terseness of Wittgenstein's German idiom ("*Wovon man nicht sprechen kann, darüber muß man schweigen*"), qualities that seem particularly apt for this, the final proposition in which the argument of the *Tractatus* culminates.

²³⁹ Wittgenstein's skepticism concerning the possibility of "ethical knowledge" harkens back to Hume, who first pointed to the is/ought dichotomy (see fn. 127, above). The inadmissibility of knowledge of this kind became one of the defining features of logical positivism. See A. J. Ayer, *Language, Truth and Logic* (London: Gollancz, 1936); Crispin Wright and Graham MacDonald, eds., *Facts, Science and Morality: Essays on A. J. Ayer's Language, Truth and Logic* (Oxford: Blackwell, 1986).

240 Tractatus Logico-Philosophicus, 5 (preface).

WITTGENSTEIN'S "STOP": THE IS/OUGHT DICHOTOMY AND THE LIMITS OF LANGUAGE

Wittgenstein went further however. His analysis had led him to draw an even more important conclusion, one that he wished to emphasize above all others. The logical positivists of the Vienna Circle were reluctant to acknowledge the pivotal (and much more humble) phrase that follows Wittgenstein's bold assertion that he had "found, on all essential points, the final solution of the problems [of philosophy]." "The thing in which the value of this work consists." he added, "is that it shows *how little is achieved* when these problems are solved."²⁴¹ To the dismay and frustration of the logical positivists, Wittgenstein was suggesting that the truly important things in life are not questions of fact but rather questions concerning what one does with and about the facts; i.e., questions of value, ethics, theology, and aesthetics, precisely those things about which "one cannot speak" according to the epistemological framework Wittgenstein circumscribes. For Wittgenstein, ironically and mysteriously, the only things that ultimately matter to the mind – namely, questions concerning what *to do* with the facts – are forever beyond the reach of language.

Under this reading of the *Tractatus*, Wittgenstein's goal appears to be to carve out a space for what *cannot* be said in propositional language, as if to give these things special importance and to preserve them from violation. The

²⁴¹ Ibid., 5 (preface). (Emphasis added.)

unspeakable space beyond the limit of language, the space of ethics and aesthetics,²⁴² is the space of everything that *colours the facts*, of those things that make use of the facts but subordinate them to intentions and goals. Ethics and aesthetics are about stipulations of axiology (value): the right and the wrong, the good and the bad, the beautiful and the ugly, what is or is not desirable, what should or should not be done in a given situation.²⁴³ The *Tractatus* places a stricture of silence over these types of issues, eliminating them from the realm of what can be meaningfully said, and asserting that, within its logical and denotational framework, language cannot posit the value of anything. "All propositions are of equal value," Wittgenstein affirms. "In the world . . . no value exists — and if it did exist, it would have no value."²⁴⁴ For Wittgenstein, the true importance of ethics and aesthetics, the ultimate sense or value and life that they breathe into the perceptible world of observable facts, transcends the realm of

²⁴⁴ *Tractatus Logico-Philosophicus,* propositions 6.4–6.41.

²⁴² Wittgenstein equates the domains of ethics and aesthetics: "It is clear that ethics cannot be put into words. Ethics is transcendental. Ethics and aesthetics are one and the same" (Wittgenstein, *Tractatus Logico-Philosophicus*, proposition 6.421). I will discuss this position in more detail below (see "Equating Ethics and Aesthetics," p. 100).

²⁴³ When Wittgenstein uses the term "ethics," he is referring to the moral "ought." In his "lecture on ethics" (*Philosophical Review*, 48 [1972]: 38-54) Wittgenstein makes a distinction between the absolute/practical use of "ought" ("you ought to keep your matches dry") and the relative/moral use of "ought" ("you ought to treat her decently").

intelligible discourse.²⁴⁵ He asserts that "in art," for example, "it is hard to say anything as good as: saying nothing."²⁴⁶

By treating the propositions of religion, morality, and aesthetics as irreconcilable with factual discourse, Wittgenstein was not rejecting them. On the contrary, he was trying to preserve them. He regarded the view that these propositions are "non-sense" (lacking in factual sense) not as a condemnation of their unintelligibility, as the logical positivists did, but rather as the most important step that had to be taken toward understanding them.²⁴⁷ In a letter enclosed with an early manuscript copy of the *Tractatus* that Wittgenstein sent to Ludwig von Ficker, he went so far as to say that the entire point of the *Tractatus* was an ethical/aesthetic one. "The point of the book is ethical," he wrote unequivocally. "My work consists of two parts: of the one which is here, and of everything which I have not written. And precisely this second part is the important one."²⁴⁸ Indeed, according to the tenets of his own

²⁴⁵ Ibid., proposition 6.421.

²⁴⁶ *Culture and Value*, 23. From a variety of Wittgenstein's unpublished notes and manuscripts G. H. von Wright gathered together aphorisms and succinctly-expressed ideas on culture and the arts, and published them under the title *Culture and Value*.

²⁴⁷ Pears, Ludwig Wittgenstein, 54.

²⁴⁸ From an undated letter to Ficker (dated 1919, probably November), published in *Wittgenstein: Sources and Perspectives*, ed. C. G. Luckhardt, trans. Bruce Gillette (Ithaca, N.Y.: Cornell University Press), 94. See also Engelmann, *Letters*, 143–44. Some commentators have noted that Wittgenstein's devaluation of the things of the world constitutes a quasi-religious stance (e.g., Jorn K. Bramann, *Wittgenstein's Tractatus and the Modern Arts*, 5). According to this reading, the *Tractatus* carries significant overtones of a mystical attitude toward the world. Others insist that Wittgenstein was essentially a positivist, and that mystical and religious interpretations of his writings are unfounded extrapolations from his text. See Cora Diamond, "Wittgenstein, Mathematics, and Ethics: Resisting the Attractions of Realism," in *The Cambridge Companion to* epistemological framework, Wittgenstein *could not* have written the second part. Biographer David Pears offers an interpretation of this aspect of Wittgenstein's philosophy:

Among the things that cannot be said, those things which he did not even try to put into words (concerning religion, ethics and aesthetics) are more important than the one that he did try to put into words. From this point of view, what makes the demarcation of the limit of factual discourse important is that it prevents encroachment and preserves these domains from discrediting pseudo-scientific treatment.²⁴⁹

Peter Winch compares Wittgenstein's linguistic line of demarcation

between factual and ethical/aesthetic propositions to one that Huckleberry Finn

encounters when he discovers that he is unable to "pray a lie,"²⁵⁰ and another

envisioned by Kierkegaard in his ethical assertion that the world is unable to

truly punish an innocent man:²⁵¹ "How wonderful, here is a limit, a limit that is

invisible, like a line that is easy to overlook with the senses, but one that has the

strength of eternity in resisting any infringement."²⁵² D. Z. Phillips calls this

inviolable line of demarcation "Wittgenstein's full stop":

²⁵⁰ "So I kneeled down. But the words wouldn't come. Why wouldn't they . . . I was trying to make my mouth *say* I would do the right thing . . . but deep down in me I knowed it was a lie -- and He knowed it. You can't pray a lie – I found that out" (Mark Twain, *Huckleberry Finn*, chapter 31).

²⁵¹ These examples (from Twain and Kierkegaard) are cited in Peter Winch, "Can a Good Man be Harmed?" in *Wittgenstein: Aesthetics, Ethics and Religion,* ed. John V. Canfield, vol. 4 of *The Philosophy of Wittgenstein* (New York: Garland, 1986), 144–45.

²⁵² Sören Kierkegaard, *Purity of Heart* (New York: Fontana Books, 1961), 85.

Wittgenstein, ed. Hans D. Sluga and David G. Stern (Cambridge: Cambridge University Press, 1996), 226-60.

²⁴⁹ Pears, *Ludwig Wittgenstein*, 89. Pears continues, "It would, of course, be a mistake to infer from this that what Wittgenstein *did* say in the *Tractatus* seemed to him to have no intrinsic importance."

In Wittgenstein's work the difficulty of stopping, the urge to go beyond a certain point in a search for explanations, justifications and foundations is explored in a variety of contexts.... The nature of the difficulties and temptations varies [but they] all involve in some way or other a failure to stop when one should stop.... It has to do with Wittgenstein's insistence on the hold which certain philosophical tendencies have on us, tendencies to say what cannot be said. The hold of these tendencies is stronger than we realize. Thinking we are free of them, we turn to some new field in which philosophical difficulties arise, only to find that there too they reassert their hold on us with all their old force.²⁵³

Wittgenstein was ultimately shedding new light on the "is/ought dichotomy" (introduced in chapter 2). By separating speech-worthy propositions concerning facts from inutterable propositions concerning ethics, aesthetics, and theology, he divides consciousness into two distinct activities: one epistemologically legitimate, the other illegitimate. The former recognizes the many and varied factual conditions of the world. The latter reorganizes, interprets, and ranks these facts. This ranking activity negates the initial equivalence of the facts that are recognized with indifference by the first activity, but it can never make a persuasive case for its claims and ranking criteria. It passes judgment but cannot support this judgment with relevant discourse. For Wittgenstein, all "foundationalist" claims in ethics and aesthetics are thus nonsense, and the entire enterprise of trying to "deduce" values is wrongminded. It is impossible to live in a world of neutral facts, and then to try to deduce, from those facts or from pure reason, absolutely binding values.

²⁵³ D. Z. Phillips, "Wittgenstein's Full Stop," in Wittgenstein: Aesthetics, Ethics and Religion, ed. John V. Canfield, vol. 4 of *The Philosophy of Wittgenstein* (New York: Garland, 1986), 355–56. For a primary source see also Ludwig Wittgenstein, *Zettel*, ed. G. E. M. Anscombe (Oxford: Blackwell, 1981), 314.

Wittgenstein concedes that it is difficult if not impossible to perceive something without evaluating it. "Ethics is transcendental," he writes, using Kantian terminology.²⁵⁴ Viewed in this light, evaluative propositions differ in kind, but not in primacy, from the facts themselves. His point is not that ethics and aesthetics can have no useful means of expression at all, but rather that they cannot attempt to co-opt the language of *knowledge*.²⁵⁵

Wittgenstein asserts that all ethics and aesthetics can properly do is to point out facts ("to draw your attention to things") and to facilitate the comparison of the factual issues under scrutiny ("to place things side by side").²⁵⁶ He insists that if, by employing these methods, you can thereby induce someone to "see what you see," but they still do not share your estimation of its value, that is "an end of the discussion."²⁵⁷ "You cannot lead people to what is good," he insisted, "you can only lead them to some place or other."²⁵⁸ According to this view, the good lies outside the space of facts.

²⁵⁷ Ibid., 315.

258 Culture and Value, 3.

²⁵⁴ Tractatus Logico-Philosophicus, proposition 6.421.

²⁵⁵ Harrison, 1910: The Emancipation of Dissonance, 185–87.

²⁵⁶ George E. Moore, "Wittgenstein's Lectures in 1930-33," in *Philosophical Papers* (London: Geo. Allen & Unwin, 1959), 314.

SCHOENBERG'S "STOP": FACTS VERSUS VALUES IN HARMONIC THEORY

Given that music theory is concerned with "music" (an *aesthetic* domain) and "theory" (what can be *said* about it), Wittgenstein's thesis about the limits of discourse concerning aesthetics has particularly important implications for music theory and pedagogy. Moreover, his position can be seen as a prophetic one for the modernist aesthetic. Lukács has observed that at the heart of the modernist revolution was the shocking realization that one could no longer invoke criteria for the "beautiful" and the "good."259 "My attempts to explain the problems [of music theory and composition] never depend on the ephemeral aesthetic judgment," Schoenberg wrote. "Since I never say beautiful nor ugly . . . the future theorist will find a relatively clean slate."²⁶⁰ Numerous critics have noted how any notion of objective criteria for the "aesthetically good" was rendered obsolete by the works and writings of Kandinsky and Schoenberg.²⁶¹ Concerning harmonic theory in particular, we have seen that Schoenberg stood opposed to the traditional value-judgments that had so often been associated with it, especially as regards the "tonality imperative" and the value and role of dissonance. When (as we saw in chapter 2) Schoenberg questions Schenker's

²⁶¹ Harrison, 1910: The Emancipation of Dissonance, 179.

²⁵⁹ Georg Lukács, "The Ideology of Modernism," in *Twentieth-Century Literary Criticism: A Reader*, ed. David Lodge (London: Longman, 1955), 474–88; idem., "Art and Objective Truth," in *Writer* and *Critic and Other Essays*. ed. and trans. Arthur D. Kahn (New York: Grosset and Dunlap, 1970), 25–60.

²⁶⁰ Theory of Harmony, 328.

valuation of tonality and its structures, he is simply applying Wittgenstein's "stop" to a problem of music theory. We also saw that Schoenberg ultimately acknowledged that music is a domain that is subject to natural laws and "facts." But, like Hanslick before him, he repeatedly emphasized the is/ought dichotomy, rejected the Stoic invocation to a life (and values) in accord with nature,²⁶² and insisted instead that seeking to know the "facts" of harmonic theory in no way suggests what composers should do with or about them. "Facts" and "acts" must be distinct in the composers mind. For Schoenberg, like Wittgenstein, questions concerning aesthetic values and ideational goals belong properly to a realm "whereof one cannot speak." Both go to great lengths to circumscribe this epistemological and discursive barrier. The difference between the is/ought dichotomy and the Icarus principle (described in chapter 2) is merely one of emphasis. The is/ought dichotomy emphasizes the unfixability and relativity of goals and values on one side of the Wittgenstein's demarcation-line, while the Icarus principle emphasizes the immutability of the *facts*, on the other side, which stabilize reality (see Figure 1, below). How easy it would be for us to imagine Schoenberg paraphrasing the conclusion of Wittgenstein's preface (to the

²⁶² Stoicism was a Greek school of philosophy that was founded by Zeno in about 308 B.C. The Stoics believed that one should be free from passion and should calmly accept all occurrences in submission to divine will and the dictates of "nature." Stoicism later formed an important feature of Roman philosophy: scholastic philosophy. Elements of stoic philosophy were woven into Christian theology and culture by Thomas Aquinas.

WITTGENSTEIN'S "STOP"

FACTS "The world is the totality of facts."

(*Tractatus Logico-Philosophicus,* proposition 1.1)

THE ICARUS PRINCIPLE, emphasizes the immutability of facts on one side of Wittgenstein's demarcation line, notwithstanding the relativity of values on the other. VALUES "Whereof one cannot speak, thereof one must be silent."

> (Tractatus Logico-Philosophicus, proposition 7)

THE IS/OUGHT DICHOTOMY emphasizes the relativity of goals and values on one side of Wittgenstein's demarcation line, notwithstanding the immutability of facts on the other.

Figure 1

Tractatus): "Even if all of the problems of music theory and discourse are solved

... how little would have been achieved in terms of the composer's task."

Schoenberg repeatedly affirms the fact/value dichotomy, not only in

Harmonielehre and the essays of Style and Idea but throughout the Gedanke

manuscripts. He wishes to emphasize that he will show not how composers

should compose, but rather how they have done so.263 Carpenter and Neff

summarize Schoenberg's fact-based approach:

Schoenberg's strongest criticism of theorists was that they said "Thou shalt" to the composer, imposing external laws, attempting to give the rule to art.²⁶⁴

An attempt is made to extract a musical logic from the facts. His facts are the examples of the musical technique of presenting an idea, shown by the masters in their masterworks. Schoenberg's theory is thus based on phenomena.... Schoenberg maintained that one learns best from the facts, not from inflexible rules laid down by theorists. He accepted honest efforts to discover tentative

263 The Musical Idea, 89.

²⁶⁴ Carpenter and Neff, Commentary on *The Musical Idea*, 7.

laws of art as necessary for the aspiring mind, but denounced those theorists who substitute a system of so-called eternal laws [universals] for the living examples of the masters, then try to impose those laws on composers. His preface to one of the *Gedanke* manuscripts declares that in his book there will be no 'Thou shalt!' ²⁶⁵

Reflecting on his own career as a teacher of composition, Schoenberg remarked

that the "true teacher of art guides his pupils toward this severe matter-of-

factness."266 He also boasted that his students were never told "you must not,"

but rather were given positive advice.²⁶⁷ Claudio Spies suggests that

Schoenberg's aversion to the "thou shalt" approach to theory and composition

was one of the reasons he so frequently maligned Paul Hindemith:²⁶⁸

I am thinking of Paul Hindemith's attitude and pedagogical stance: he never hesitated to show his students 'how it is done' or 'how it *has* to be done'; he would simply take his pen and promptly correct (or re-compose) those junctures in submitted work that seemed to him defective. He required the strictest adherence to technical and stylistic preferences of his own – which may as well be called imitation or stylistic approximation, representing an approach that is virtually unthinkable to many of those of us who have taught composition! The results were bound to be destructive, if not, indeed, tragic: Hindemith's students seldom became sufficiently independent to avoid being branded with his particular notions of how compositions 'should be done'. Nothing of this kind could be asserted about Schoenberg: from Berg and Webern on to Kirchner, Kim,

²⁶⁵ Ibid., 9. Carpenter and Neff are describing Schoenberg's *Gedanke* manuscript no. 10 (1934), and commenting on remarks Schoenberg makes in the first chapter of *Theory of Harmony*: "Art theory observes a number of phenomena, classifies them according to some common characteristics, and then derives laws from them, which is of course the correct procedure. But it is not content to be merely the attempt to find laws; it professes to have found *the eternal laws* . . . There is so little grandeur in the sound of it, if the teacher tells the pupil: One of the most gratifying means for producing musical form is tonality. What a different impression it makes, though, if he speaks of the principle of tonality, as of a law – 'Thou shalt . . .' – adherence to which shall be indispensable to all musical form . . . Dare to feel otherwise, young artist, and you have them all against you" (Schoenberg, *Theory of Harmony*, 8–9).

²⁶⁶ "Problems in Teaching Art (1911)," in *Style and Idea*, 368.

²⁶⁷ "The Task of the Teacher (1950)," in *Style and Idea*, 390.

²⁶⁸ For example, see "Glosses on the Theories of Others [1929]," in *Style and Idea*, 313–15.

or Cage, all composers who worked with Schoenberg went their own way. Schoenberg insisted on instilling in them all a feeling of indispensable independence and individuality of musical thought, as well as on each individual student's obligation to cultivate such independence.²⁶⁹

Schoenberg addresses this question repeatedly and directly:

It is indeed our duty to reflect over and over again upon the mysterious powers of art . . . regarding nothing as given but the phenomena. These we may more rightly regard as eternal than the laws we believe we have found. Since we do definitely know the phenomena, as facts, we might be more justified in giving the name "science" [*Wissenschaft*] to our knowledge of the phenomena, rather than to those conjectures that are intended to explain them.²⁷⁰

THE PROPER ROLE OF ART THEORY AND AESTHETICS: POINTING TO FACTS AND MAKING COMPARISONS

We have seen that Wittgenstein concluded that all ethics and aesthetics can properly do is to point out facts ("to draw your attention to things") and to facilitate the comparison of the factual issues under scrutiny ("to place things side by side").²⁷¹ Schoenberg emphasizes precisely this same distinction. We have seen how, in the introductory chapter of *Harmonielehre* (written ten years before Wittgenstein's *Tractatus*), Schoenberg underlines a distinction between "theories" and "systems of presentation" (*Darstellung*).²⁷² According to his definition, "theories" of music are based upon *a priori* conceptions (including

²⁶⁹ Claudio Spies, "Schoenberg's Influence on Composing in America," *Journal of the Arnold Schoenberg Institute*, 19/2 (November, 1996): 760.

²⁷⁰ Theory of Harmony, 8.

²⁷¹ Moore, "Wittgenstein's Lectures in 1930-33," 314-15.

²⁷² Theory of Harmony, 7–12.

conceptions of value) that are meant to encompass all music, whereas "systems of presentation" are concerned only with the presentational "facts" of music, and avoid the needless encumbrance of universalist metaphysics and theory. Thus, when speaking, thinking, and teaching about music, Schoenberg insists that the system of presentation is the only epistemologically legitimate mode of expression.

Like Wittgenstein, Schoenberg also emphasizes the importance of "making comparisons" in aesthetics and pedagogy. As Severine Neff has observed, "for Schoenberg, to theorize is to compare."²⁷³ Throughout *Harmonielehre*, Schoenberg compares the futility of trying to teach aesthetics/values with the importance of teaching "handicraft," working with the facts and materials, and making discriminating comparisons:

[I] regard instruction in composition as solely instruction in the handicraft, and nothing more. Thereby, the problem is solved (i.e., the problem arising from aesthetics and its prescriptions), since the necessities of a handicraft are not binding on art.²⁷⁴

Efforts to discover laws of art can then, at best, produce results something like those of a *good comparison*: that is, they can influence the way in which the sense organ of the subject, the observer, orients itself to the attributes of the object observed. In making a comparison we bring closer what is too distant, thereby enlarging details, remove to some distance what is too close, thereby gaining perspective. . . . However much I may theorize in this book – for the most part. in order to and refute false theories, I am compelled to expand narrow and confining conceptions to include the facts – however much I may theorize, I do so with constant and full awareness that I am only presenting *comparisons*,

²⁷³ Severine Neff, Introduction to *Coherence, Counterpoint, Instrumentation, Instruction in Form,* lxi. Nicholas Cook also draws attention to this aspect of Schoenberg's epistemology ("Music Theory and 'Good Comparison,'" 124).

²⁷⁴ Theory of Harmony, 410.

symbols which are merely intended to connect ideas apparently remote from one another, to promote intelligibility through coherence of presentation, and to stimulate the pupil to productive work by showing him the wealth of ways in which all facts relate to an idea. But not to set up new eternal laws. If I should succeed in teaching the pupil the handicraft of our art as completely as a carpenter can teach his, then I shall be satisfied. And I would be proud if, to adapt a familiar saying, I could say: 'I have taken from compositions pupils a bad aesthetics and have given them in return a good course in handicraft.'²⁷⁵

"IMPORTANT NONSENSE": SHOWING THE VALUE OF VALUES

Can the notion of value exist in any meaningful sense if we cannot speak about it? This paradoxical aspect of Wittgenstein's thought has been the subject of considerable controversy in philosophy. Schoenberg and Wittgenstein provide strikingly similar answers to this question. Schoenberg asserts that the logic of the artwork *itself* embodies and expresses its own value, a value that cannot be discerned by means of anything we might wish to say (or any way in which we my try to theorize) about it.²⁷⁶ Wittgenstein held to a very similar view: "The poet's sentences achieve their effect not through what they say but through what is manifest in them, and the same holds true for music, which also says nothing."²⁷⁷ Indeed, even some members of the Vienna Circle acknowledged that art might be an appropriate mode by means of which to

²⁷⁵ Ibid., 11. (Emphasis added.)

²⁷⁷ Engelmann, Letters, 83.

²⁷⁶ "Schoenberg and Adorno define structural listening not as a sensibility to chic but as attentiveness to a concretely unfolding logic which can vouch for the value of the music" (Rose Subotnik, "Toward a Deconstruction of Structural Listening, 95).

attempt to address the realm of value.²⁷⁸ Carnap explicitly describes art (and especially music) as that which attempts to express or point to values that cannot be legitimately expressed by means of language, but he adamantly considered metaphysical and foundationalist conceptions of value to be hopelessly futile verbiage within philosophical discourse (a stricture that he would have surely extended to music theory and aesthetics).²⁷⁹ "Art," writes Carnap, "is an adequate, metaphysics an inadequate means for the expression of a basic attitude [toward life]. . . . Metaphysicians are musicians without musical ability." ²⁸⁰

Understanding Wittgenstein's nuanced view of the nature and importance of ethics and aesthetics is one of the great challenges of reading the *Tractatus*. We have seen that Wittgenstein ascribes the greatest importance to ethics and aesthetics, although he assigns them to a domain beyond the realm of language and facts. But if we cannot talk about values, can Wittgenstein *say* that values themselves have value without refuting himself? Furthermore, if what matters most in life and in the world are precisely those things we are unable to speak

²⁷⁸ "These activities, they held, are expressions of visions, feelings, and emotions and, as such, as perfectly legitimate as long as they make no claims to genuine cognition or representation of reality" (*Encyclopedia* Brittanica, Online edition, 2001, s.v. "Positivism," 7).

²⁷⁹ Carnap, "The Elimination of Metaphysics," 78–80.

²⁸⁰ Ibid., 79–80. He continues: "Instead they [metaphysicians] have a strong inclination to work within the medium of the theoretical, to connect concepts and thoughts. Now, instead of activating, on the one hand, this inclination in the domain of science, and satisfying, on the other hand, the need to expression in art, the metaphysician confuses the two and produces a structure which achieves nothing for knowledge and something inadequate for the expression of [a spiritual?] attitude."

about intelligibly and coherently (i.e., ethics, aesthetics, values), what form can "mattering most" possibly take?

Wittgenstein was fully aware of the problematic irony here. He was also aware that, according to his own framework, positing the truth and value of many of the propositions in the *Tractatus* itself must be regarded as an appeal to philosophical nonsense. Wittgenstein thus invokes an escape clause in the fascinating and much-discussed sleight of hand that he employs at the conclusion of the *Tractatus*:

My propositions serve as elucidations in the following way: anyone who understands me eventually recognizes them as nonsensical, when he has used them – as steps – to climb up beyond them. (He must, so to speak, throw away the ladder after he has climbed up on it.) He must transcend these propositions, and then he will see the world aright.²⁸¹

Wittgenstein seems to be introducing a conception of "elucidation" and granting it a status which is somewhat distinct from that of the fact-stating propositions.

It is precisely these aspects of Wittgenstein's early thought that have most mystified and frustrated positivist commentators. Frank Ramsey famously and derisively described Wittgenstein's position as tantamount to a claim that ethics are "important nonsense,"²⁸² and James Conant repudiates the suggestion that

²⁸¹ Tractatus Logico-Philosophicus, proposition 6.54.

²⁸² Frank P. Ramsey, *The Foundations of Mathematics and Other Logical Essays* (London: Routledge, 1931), 263. Ramsey's book is liberally peppered with other irreverent commentary on Wittgenstein, including remarks such as "What we can't say we can't say, and we can't whistle it either" (p. 238).

some domains of thought can be regarded as "nonsensical, but significant."²⁸³ But Wittgenstein's notion of nonsense does not bear any simple relationship to the notion of nonsense in ordinary usage. For Wittgenstein, the view that philosophical, ethical, theological, and aesthetics propositions are nonsense in this technical sense does not imply that they are absurd or worthless. Some members of the Vienna Circle (Neurath, Ayer, and Waismann, for example) were more inclined than others to entertain Wittgenstein's conception of the inexpressible value of values and to regard it as worthy of serious attention.²⁸⁴ In the discussion below we will see that, concerning the question of values, both Schoenberg and Wittgenstein felt that "action" and "doing" – making values manifest in composition itself (for Schoenberg) and in life itself (for Wittgenstein) – were more legitimate modes of expressing value than erecting metaphysicalizing edifices of theory and philosophy.

EQUATING ETHICS AND AESTHETICS: EMPHASIS ON PRAXIS OVER THEORY

Throughout the foregoing discussion we have seen that one of the novel features of Wittgenstein's philosophy is that it fully equates ethics and aesthetics.

284 Ayer, Wittgenstein, 87.

²⁸³ James Conant, "Must We Show What We Cannot Say?" in *The Senses of Stanley Cavell*, ed. R. Fleming and M. Payne (Lewisbury, Pennsylvanian: Bucknell University Press, 1989), 242-83. Conant refutes the standard interpretation of the *Tractatus*, according to which Wittgenstein promotes the view that something that could be described as "important nonsense" exists. Conant feels that the *Tractatus* must be read as a thorough-going positivist document, one in which all forms of logical nonsense are regarded simply as "garden-variety gibberish."
Wittgenstein speaks of an actual *identity* between these domains, he does not simply ascribe a comparable epistemological status to them, or suggest that one can be used to inculcate or inspire the other.²⁸⁵ "Ethics and aesthetics are one and the same," he writes, unequivocally.²⁸⁶

Schoenberg apparently also held this singular view. Alexander Ringer has described how Schoenberg conveys a conception of "law" that relates equally well to the establishment of moral principles and precepts as to issues of form in musical composition.²⁸⁷ Indeed in his summary account of the elements underlying the "musical idea," Schoenberg shows that he equates ethics and aesthetics conceptually. Neither explaining nor elaborating upon his understanding of this relationship, Schoenberg writes that:

The presentation of the musical idea is contingent upon: (1) the laws of logic, of coherence, and of comprehensibility, (2) the aesthetic demands of diversity,

²⁸⁶ *Tractatus Logico-Philosophicus,* proposition 6.421: "It is clear that ethics cannot be put into words. Ethics is transcendental. (Ethics and aesthetics are one and the same)."

²⁸⁵ This is an idea of ancient origin. According to the Attic conception of *ethos*, modes and styles of music reflect and express the ethical nature of the peoples among whom they originate. Plato argued that sober and ordered music improves the character, while vulgar and cloying music has a deleterious effect, and he described melodies that characterize the brave man and those that befit the coward. "When modes of music change," he wrote in the *Republic* (Book 3), "the fundamental laws of the states change with them." Plato considered education in music to be a propaideutic to the study of philosophy, a requirement for civic order, and a model for political life in general. In an essay found in Book One of *De institutione musica* ("Music is related to us by nature and can ennoble or corrupt the character"), Boethius conveys these Greek ideas to the Middle Ages (see Oliver Strunk, ed., *Source Readings in Music History: From Classical Antiquity through the Romantic Era* [New York: Norton, 1950], 79–86). Numerous maxims and anecdotes from musical lore embody this idea. Legend has it, for example, that when an aristocratic admirer praised Handel for the "noble entertainment" which a performance of the *Messiah* had provided for his town, Handel is said to have replied: "My lord, I should be sorry if I only entertained them;" I wished to make them better."

²⁸⁷ Alexander L. Ringer, "Schoenberg and the Prophetic Image in Music," *Journal of the Arnold Schoenberg Institute*, 1/1 (1976): 26–38.

change, richness and profundity, beauty, (3) the "human" requirements of ethics. $^{\rm 288}$

In an earlier essay, Schoenberg remarked that the appreciation of any great work of art, in all of its richness and profundity, is accessible only to those whose "artistic and ethical culture is on a high level."²⁸⁹

In all of the foregoing, we can discern a single over-riding concern that is shared by Schoenberg and Wittgenstein. We have already briefly encountered their common belief in the value of "doing" and "showing" over "theorizing." Whether it is a composer *creating an aesthetic object* or a person *performing an ethical act* of some kind, they are indisputably acting in the world, contributing to new and irrefutable facts of the world. "Doing" and "showing" are therefore not subject to the epistemological pitfalls inherent in conceptualizing and theorizing about the arts and ethics. The mathematician and quantum-physicist Hermann Weyl expressed this idea eloquently: "One can speak of an original obscurity of reason. We do not possess the truth, we do not perceive it in simply opening our eyes, but we must attain it through action."²⁹⁰ Numerous remarks found throughout Schoenberg's writings capture this aspect of his outlook:

Modern music has greater need for performance than for defense.²⁹¹

²⁸⁸ *The Musical Idea*, 103. See also fn. 28, above.

²⁸⁹ "Mahler [1912]," Style and Idea, 450.

²⁹⁰ The Open World: Three Lectures on the Metaphysical Implications of Science (New Haven: Yale University Press, 1932), 83.

²⁹¹ Theory of Harmony, 408.

Even a good composer . . . in the moment when he writes criticisms . . . is not a composer, not musically inspired. If he were inspired he would not describe how the piece ought to be composed, he would compose it himself.²⁹²

You neither must, may write tonally, nor must you, may you, write atonally. Write or don't write, but in any case don't ask, but do what you can.²⁹³

In life, deeds alone can prove effective; even works are too far removed.²⁹⁴

Likewise, Wittgenstein affirms that matters of a mystical nature cannot be put into words but instead "show themselves" or "make themselves manifest" (he employs the German verb *zeigen sich*).²⁹⁵ According to Paul Engelmann, Wittgenstein's friend and memoirist, "the view of the *Tractatus* can be summed up briefly by saying 'ethical propositions do not exist; ethical action does exist.'"²⁹⁶ Perhaps Wittgenstein and Schoenberg had both been inspired by Goethe's reformulation of the open phrase of the Gospel according to St. John:

> 'In the beginning was the Word': why, now I'm stuck already! I must change that; how? Is then 'the word' so great and high a thing? There is some other rendering, Which with the spirit's guidance I must find. We read: 'In the beginning was the Mind.' Before you write this first phrase, think again; Good sense eludes the over-hasty pen. Does 'mind set worlds on their creative course? It means: 'In the beginning was the Force.'

²⁹⁴ "Franz Liszt's Work and Being [1911]," in *Style and Idea*, 446.

²⁹⁶ Engelmann, *Letters*, 108-10.

²⁹² "The Relationship to the Text [1912]," in *Style and Idea*, 143.

²⁹³ "Opinion or Insight [1926]," in *Style and Idea*, 263-64.

²⁹⁵ *Tractatus Logico-Philosophicus*, proposition 6.522: "There are, indeed, things that cannot be put into words. They *make themselves manifest*. They are what is mystical."

So it should be – but as I write this too, Some instinct warns me that it will not do. The spirit speaks! I see how it must read, And boldly write: *'In the beginning was the Deed*!'²⁹⁷

SCHOENBERG ON THE LIMITS OF LANGUAGE: "O WORD, THOU WORD THAT I LACK"

We have seen that both Schoenberg and Wittgenstein insisted on a factbased discourse in aesthetics. However they also wished to emphasize that in speaking about the facts, we do not get to the bottom of the matter. They emphasized the limits of language. They considered art to be of supreme value, but they considered its value to be of a sort that can be captured only by the artwork and artistic activity itself, and not by any aesthetic language that we may attempt to build in support of (or against) it.

A possible source of this idiosyncratic view can be found in the cultural and religious heritage common to both Schoenberg and Wittgenstein: the laws and traditions of Judaism. Uttering the name of God – attempting to give form to the unknowable, through language – is forbidden in Jewish law. This injunction equates any attempt to create an "image" of God with other prohibited forms of

²⁹⁷ Johann Wolfgang von Goethe, *Faust* [1808], Vol. 1, trans. David Luke (Oxford: Oxford University Press, 1987), 39 (Part 1, Scene II: lines 1224-1237). (Emphasis added.). In *Culture and Value* (pp. 31, 36), *On Certainty* (p. 402), and *Philosophical Occasions* (p. 395), Wittgenstein cites this passage from Goethe ("*Im Angang war die Tat*") in support of his emphasis on human activity over theory and intellect.

idolatry. Schoenberg's incomplete operatic masterpiece, *Moses and Aron*,²⁹⁸ is centrally preoccupied with precisely this theme.²⁹⁹ It is the first large-scale work for which Schoenberg wrote a text with specifically Jewish subject matter. Considerable scholarly scrutiny has been devoted to examining the ways in which *Moses and Aron* embodies Schoenberg's entire religious and aesthetic outlook.³⁰⁰ According to Pamela White, it "embodies all of the major philosophical components of the Jewish faith held by Schoenberg in the middle 1920s."³⁰¹

²⁹⁸ Half in humour and half out of superstition, Schoenberg preferred this spelling ("Aron" instead of "Aaron") since its twelve letters are a symbolic counterpart to the twelve tones of serial technique.

²⁹⁹ This over-arching theme can be identified not only in the thought of Schoenberg and Wittgenstein, but in that of other celebrated turn-of-the-century Jewish intelligentsia: Marx, Freud, Kafka and Kraus each expressed, in his own way and in his own domain, this earnest desire to uncover that which remains hidden, but which guides our thought and behaviour. See Peters and Marshall, *Wittgenstein: Philosophy, Postmoderism, Pedagogy* (Westport, Connecticut: Bergin & Garvey, 1999), 27; Peter Gay, *Freud, Jews and Other Germans: Masters and Victims in Modernist Culture* (New York: Oxford University Press, 1978).

³⁰⁰ White, Schoenberg and the God-Idea: Moses and Aron; Michael Cherlin, "Schoenberg's Representation of the Divine in Moses and Aron," Journal of the Arnold Schoenberg Institute, 9/2 (November, 1986): 210-17; idem., "The Formal and Dramatic Organization of Schoenberg's Moses and Aron" (Ph.D. Dissertation, Yale University, 1983); David Schiff, "Jewish and Musical Tradition in the Music of Mahler and Schoenberg," Journal of the Arnold Schoenberg Institute, 9/2 (1986): 217-31; David Lewin, "Moses und Aron: Some General Remarks, and Analytic Notes for Act 1, Scene 1," Perspectives of New Music, 6/1 (Fall-Winter 1967): 1–17; reprinted in Perspectives on Schoenberg and Stravinsky, ed. B. Boretz and E. T. Cone (New York: W.W. Norton, 1972), 61-77; Milton Babbitt, "Moses and Aaron," in Perspectives on Schoenberg and Stravinsky, ed. B. Boretz and E. T. Cone (New York: W.W. Norton, 1972), 53-60; Hans Keller, "Moses, Freud and Schoenberg," Monthly Musical Review, 88 (1958): 12, 63; Bluma Goldstein, Reinscribing Moses: Heine, Kafka, Schoenberg in a European Wilderness (Cambridge: Harvard University Press, 1992); George Steiner, "Schoenberg's Moses and Aaron," chap. 10 in Language and Silence (New York: Atheneum, 1967), 127-39; Alexander L. Ringer, Arnold Schoenberg: the Composer as Jew (Oxford: Clarendon, 1990); idem., "Schoenberg and the Prophetic Image in Music," 26-38; Alan Philip Lessem, Music and Text in the Works of Arnold Schoenberg: the Critical Years, 1908-1922 (Ann Arbor: U. M. I. Research Press, 1979).

³⁰¹ White, Schoenberg and the God-Idea, 29.

Throughout the opera, Moses is plagued by a problem of language, the simultaneous duty and yet impossibility of giving expression to inexpressible divine truths. This is the problem that lies at the core of Wittgenstein's *Tractatus*. What Wittgenstein wanted to demonstrate, according to Engelmann, was "that endeavours of human thought to 'utter the unutterable' are a hopeless attempt to satisfy man's eternal metaphysical urge."³⁰² This is the problem that is framed by the opening and closing lines of *Moses and Aron*. The opera begins with Moses' enunciation of a list of adjectives describing the attributes of God: ³⁰³

Einziger, ewiger, allgegenwärtiger, unsichtbarer und unvorstellbarer Gott!

(Only one, infinite, thou omnipresent one, unperceived and inconceivable)

It closes equally dramatically with a summary of the essential dilemma which has

confronted Moses throughout the drama:

Unvorstellbarer Gott! Unaussprechlicher, vieldeutiger Gedanke! Lässt du diese Auslegung zu? Darf Aron, mein Mund, dieses Bild machen? So habe ich mir ein Bild gemacht, falsch, wie ein Bild nur sein kann! So bin ich geschlagen! So war alles Wahnsinn, was ich gedacht habe, und kann und darf nicht gesagt werden! O Wort, du Wort, das mir fehlt!

(Inconceivable God! Inexpressible, many-sided idea! Wilt thou let it be so explained? Shall Aron, my mouth, fashion this image? Then I have fashioned an image too, false, as an image must be! Thus am I defeated! Thus, all was but madness that I believed before and can and must not be given voice. O word, thou word, that I lack!)

³⁰³ Cherlin, "Schoenberg's Representation of the Divine," 213.

Beyond its expression in *Moses and Aron*, this notion of an unknowable and divine realm that is inaccessible to language informs Schoenberg's entire conception of musical expression. It is clearly manifest in his conception of "the musical idea." A precise definition of the "musical idea" has been elusive for Schoenberg scholars, precisely because he describes it, in necessarily vague terms, as a germinal conception in the mind of the composer that underlies and animates an entire musical work, but that is indescribable, in itself, in language.³⁰⁴ In formulating the musical idea in this way, Schoenberg poses a basic and inherently "unanswerable question about the nature of musical expression,"³⁰⁵ just as Wittgenstein's *Tractatus* had posed a question about the nature of ethics that is inherently unanswerable through language.

WITTGENSTEIN, SCHOENBERG, AND SCHOPENHAUER: THE ART OBJECT SUB SPECIE AETERNITATIS

In our discussion of "the Icarus principle" in chapter 2, we saw that Schoenberg did not deny the importance of music-theoretical "facts" concerning the nature of the materials themselves. With respect to the notion of the "emancipation of dissonance," for example, he did not attempt to claim that dissonances are not dissonant. He wished only to emphasize that we gain nothing by passing judgment on them and on the variety of ways in which they

³⁰⁵ Schiff, "Jewish and Musical Tradition," 230.

³⁰⁴ Schoenberg, *The Musical Idea*; Goehr, "Schoenberg and Karl Kraus," 59–71; Cherlin, "Schoenberg's Representation of the Divine," 210–16. See also fn. 28, above.

may be employed. On the contrary, he maintained that an entirely new and marvelous sonic world will open up to listeners who will suspend that judgment and refine the hearing faculty in order to immerse themselves in the comprehensible dissonances and intervallic-structures of his music. For Schoenberg, consonances and dissonances need not be considered antithetical or aesthetically differentiated.³⁰⁶ They are simply *intervals*, musical objects with identifiable qualities, and as such they share the property of being organizable, in myriad ways and at the composer's discretion, to form the structural

underpinnings of musical systems.

This outlook bears witness to the unmistakable influence of Schopenhauer.

In The World as Will and Representation, Schopenhauer discusses a form of

contemplation in which:

[We relinquish] the ordinary way of considering a thing [and] no longer consider the where, the when, the why, and the whither in things, but simply the *what*.... We must not let abstract thought, the concepts of reason, take possession of our consciousness, but, instead of all this, devote the whole power of our mind to perception, sink ourselves completely therein, and let our whole consciousness be filled by the calm contemplation of the object actually present, whether it be a landscape, a tree, a rock, a crag, a building, or anything else. We lose ourselves entirely in this object, to use a pregnant expression.... It was this that was in Spinoza's mind when he wrote: *Mens aeterna est quatenus res sub specie aeternitatis* (The mind is eternal insofar as it conceives things from the standpoint of eternity).³⁰⁷

 $^{^{306}}$ See my discussion of Schoenberg's conception of "the emancipation of the dissonance" (above, p. 15).

³⁰⁷ Arthur Schopenhauer, *The World as Will and Representation*, Vol. I, trans. E. F. J. Payne (New York: Dover, 1966), 179.

Schopenhauer also echoes these remarks in his commentaries on art. For Schopenhauer, our role in the presence of art is not to judge but to contemplate, and the artist's task is to present us with objects of contemplation, to reveal the extraordinary in the ordinary:

[Art] plucks the object of its contemplation from the stream of the world's course, and holds it isolated before it. This particular thing, which in that stream was an infinitesimal part, becomes for art a representative of the whole. ... It therefore pauses at this particular thing; it stops the wheel of time.³⁰⁸

The unmistakable influence of Schopenhauer is clearly evident in

Wittgenstein's view of aesthetics, his equation of aesthetics with ethics, and his

imitation of Schopenhauer's invocation of Spinoza's Latin phrase sub specie

neternitatis ("from the standpoint of eternity"). In the notebook where he

compiled preliminary ideas for the *Tractatus*, Wittgenstein wrote:

The work of art is the object seen *sub specie aeternitatis;* and the good life is the world seen *sub specie aeternitatis*. This is the connection between art and ethics. The usual way of looking at things sees objects as it were from the midst of them, the view *sub specie aeternitatis* from outside.³⁰⁹

The phrase appears again in the form of three consecutive propositions in the

Tractatus itself:

How things are in the world is a matter of complete indifference for what is higher. It is not *how* things are in the world that is mystical, but *that* it exists. To

³⁰⁸ Ibid., 185.

³⁰⁹ Ludwig Wittgenstein, *Notebooks* 1914-16, ed. G. E. M. Anscombe and G. H. von Wright (Oxford: Blackwell, 1961), 83 (proposition 7.10.16).

view the world *sub specie aeterni* is to view it as a whole – a limited whole. Feeling the world as a limited whole – it is this that is mystical.³¹⁰

This theme is one of the consistent threads that runs through all of Wittgenstein's philosophy (both of the early and late periods). There is an orientalist quality of mysticism and contemplation in Wittgenstein's descriptions of art and the artist:³¹¹

Only an artist can so represent an individual thing as to make it appear to us as a work of art.... A work of art forces us ... to see it (the object) in the right perspective, but in the absence of art, the object is just a fragment of nature like any other.³¹²

In this same Schopenhauerian spirit, and with precisely Wittgenstein's sense of ontological wonderment, Schoenberg consistently strove to probe the "is-ness," the "living certitude"³¹³ of dissonance and harmony.³¹⁴ Thomas Harrison notes that a passage from Nietzsche's *The Birth of Tragedy Out of the Spirit of Music* presages Schoenberg's view: "[in dissonance] surely a higher pleasure must be perceived . . . a desire to hear and at the same time long to get

³¹⁰ *Tractatus Logico-Philosophicus*, propositions 6.432, 6.44, and 6.45. Wittgenstein also explores the blurring of the subject/object distinction in propositions 5.631–5.6331.

³¹¹ One can detect other orientalist aspects in the *Tractatus*. "It is unlikely that Wittgenstein had any experience with the religions of Asia before he wrote the *Tractatus*, but . . . there is a Zen flavor to the *Tractatus*, particularly its concluding portions. . . . In many respects [it] is like a very long koan: it makes assertions and then at the end nullifies them all. The true meaning must be beyond both the assertions and their nullity" (Roy Lemoine, *The Anagogic Theory of Wittgenstein's Tractatus* [Paris: Mouton, 1975], 173).

³¹² Culture and Value, 4.

³¹³ "Opinion or Insight [1926]," in *Style and Idea*, 258.

³¹⁴ White, "Schoenberg and Schopenhauer," 39–57.

beyond all hearing."³¹⁵ Harrison describes Schoenberg's plea for the contemplation of the essences of musical materials, born of the expressionist aesthetic:

The 'inwardly seen' is more than what lies in the eye of the artist [or the ear of the composer/listener]; it is what lies in the innerness of things themselves, and can never be illuminated by mere scientific descriptions.³¹⁶

For Schoenberg, dissonant intervals and sonorities are facts of the world. They are like sculpture and objects of nature, rare diamonds that must be contemplated for their own sake, and from every perspective "as in Swedenborg's heaven [where] there is no absolute down, no right or left, forward or backward."³¹⁷ Ernst Krenek makes a similar case for the merits of focusing on "the single sound": "The atomizing effect of serial thinking concentrates one's attention on the single sound, the texture and colour quality of which gains new importance."³¹⁸ Karol Szymanowski corroborates this view with respect to Schoenberg's harmonic theory and project: "The concept of an absolute vertical

³¹⁶ 1910: The Emancipation of Dissonance, 144.

³¹⁷ "Composition with Twelve Tones (I) [1941]," in *Style and Idea*, 223.

³¹⁵ Friedrich Nietzsche, *The Birth of Tragedy Out of the Spirit of Music*, trans. Francis Golffing (New York: Doubleday, 1956), 143 (section 24). Further on in the passage Nietzsche equates dissonance with primordial artistic power.

³¹⁸ Ernst Krenek, "Schoenberg the Centenarian," *Journal of the Arnold Schoenberg Institute*, 1/2 (February, 1977), 89.

sound as a *value in itself*, not as a function of musical "expression," became the transition to [Schoenberg's] essential atomism."³¹⁹

This is ontological mysticism writ large, pure non-judgmental contemplation, an east-meets-west neo-Buddhism in music.³²⁰ In addition to bearing witness to the undoubted influence of Schopenhauer, orientalist aspects of Schoenberg's thought may also have been stimulated by his relationship with Dehmel, Kandinsky, and the other artists of *Die Blaue Reiter*.³²¹ Given Schoenberg's heritage and his oft-stated assertion that the twelve-tone system was an inevitable consequence of Wagner's extension and exhaustion of the resources of diatonicism, it is worth recalling that Wagner's projected final opera – *The Victors* – was to have been about the life of Buddha, interpreted from the perspective of Schopenhauer's philosophy.³²² The Buddhist notion of the subject's self-transcendence through the contemplation of the object was pursued

³²² Paul L. Rose, Wagner, Race and Revolution (New York: Harper-Collins, 1996), 95–98.

³¹⁹ Botstein, "Schoenberg and the Audience, 47–49. (Emphasis added.) Botstein's article includes a full English translation of Karol Szymanowski's essay "On the Question of Contemporary Music" ["W sprawie muzyki wspólczesnej," 1925].

³²⁰ Harrison, 1910: *The Emancipation of Dissonance*, 198.

³²¹ See White, *Schoenberg and the God-Idea*, 55. The influence of "east-meets-west" philosophy is evident in the novels of Schoenberg's contemporaries Hermann Hesse (e.g., *Siddhartha*) and Thomas Mann (e.g., *The Magic Mountain*), who may also have drawn their inspiration from orientalist aspects of Schopenhauer's philosophy. Schopenhauer wrote: "If I were to take the results of my philosophy as the standard of truth, I would have to consider Buddhism the finest religion of all" [*Die Welt als Wille und Vorstellung* II, (*Ergänzungsband*), *Schopenhauer Samtliche Werke* (Munchen: Piper Verlag, 1911), 186]. He wrote extensively about Buddhism and he propounded the curious notion that Buddhism, rather than Judaism, was the original source of Christianity [Peter Abelson, "Schopenhauer and Buddhism," *Philosophy East and West*, 43/2, (April, 1993): 255– 78]; Dorothea Dauer, *Schopenhauer as Transmitter of Buddhist Ideas* (Berne: Lang, 1969).

further in the generation following Schoenberg, particularly by Olivier Messiaen and his students Karlheinz Stockhausen and Pierre Boulez (the Darmstadt School), ³²³ and by John Cage and his student Morton Feldman, among others.³²⁴

REJECTING "HEART AND BRAIN" DUALISM

Paul Engelmann notes that, since the stirrings of modernism were awakening during the first decades of the twentieth century (a fact that figures prominently in written histories of the period), it is sometimes forgotten that these years were also characterized by a "wave of irrationalism and glorification of sentiment."³²⁵ He describes how opinion consequently became polarized around the question of the proper role of "heart and brain" in art.³²⁶ A strikingly similar and equally-polarized debate has raged since the late twentieth-century between positivist- and postmodernist-musicologists.³²⁷ The watchword of the turn-of-thecentury movement pointed to a theme that has found renewed resonance among some present-day postmoderns: "Get rid of reason which has caused our

³²³ The Internationale Ferienkurse fur Neue Musik (International Summer Courses for New Music), established in Darmstadt by Wolfgang Steinecke in 1946. Messiaen was a father-figure and mentor for the Darmstadt school.

³²⁴ Cage's attachment to Zen Buddhism, and his exploration of musical non-intentionality, predates his 1958 arrival in Darmstadt. Cage's *Music of Changes*, a piece for solo piano inspired by the *I Ching* (the Chinese "Book of Changes"), for example, was written in 1951. This common interest in oriental philosophy and mysticism may have been a source of dialogue and attraction between Cage and the Darmstadt group.

³²⁵ Engelmann, Letters, 89.

³²⁶ Ibid., 89. For example, see Rothfarb, "Hermeneutics and Energetics," 43-68.

³²⁷ For example, see Guck, "Music Loving," 201-212.

misfortune . . . let us seek salvation in feeling without reason!'³²⁸ Though Schoenberg railed against anti-intellectual sentimentality in music ("such works only demonstrate the complete absence of a brain and show that this sentimentality has its origin in a very poor heart"),³²⁹ and Wittgenstein opposed unbridled sentimentality in philosophy ("these are the very views against which the *Tractatus* is directed in the first place"),³³⁰ both Schoenberg and Wittgenstein rejected the dualism that this debate presupposes.

Wittgenstein strongly objected to the kind of heart-brain dualism that was espoused by the members of the Vienna Circle.³³¹ Chronicles of his meetings with the Circle are revealing in this respect. Carnap, in particular, opposed Wittgenstein's stance:

For someone in Carnap's tradition it is essential to keep the emotions and the intellect distinct but . . . the thrust of Wittgenstein's thinking was to show the vital (and mystical) connection between the two. . . . Even someone as close to Wittgenstein in time and place as Carnap could never quite find his feet with him in their early discussion. The fact that he defended both religion and Schopenhauer and then sometimes read poetry to them when he [Carnap] and Schlick came expecting to talk logic led Carnap to claim 'that there was a strong inner conflict in Wittgenstein between his emotional life and his intellectual thinking'.³³²

³²⁸ Engelmann, *Letters*, 89.

³²⁹ "Heart and Brain in Music [1946]," in Style and Idea, 76.

³³⁰ Engelmann, *Letters*, 89.

³³¹ For postmodernist commentators like Jean-François Lyotard, this stance constitutes "Wittgenstein's strength" (Lyotard, *The Postmodern Condition*, 41).

³³² Benjamin R. Tilghman, *Wittgenstein, Ethics and Aesthetics: The View from Eternity* (Albany: State University of New York Press, 1991), 18. Tilghman is citing Rudolf Carnap, "Autobiography," in *The Philosophy of Rudolf Carnap*, ed. P. A. Schilpp (LaSalle, Ill.: Open Court, 1964), 27. Although

Engelmann summarizes Wittgenstein's position concerning the role of both heart

and brain in the creation and appreciation of works of art:

It is not a question of head *or* heart, reason *or* emotion: the watch-word must be reason *with* emotion, head *and* heart. We cannot say: what we lack is feeling. But we shall be much nearer the truth in saying: what our reason lacks is feeling, we need reason endowed with feeling, indeed with the unspoken feeling that is manifest in our reason; it is what we call heart: feeling which does not pour freely outwards in emotional self-indulgence, but which is restrained, turned inward, thus suffusing the whole personality and bringing warmth even to its coolest part, the seat of reason.³³³

Calling to mind Pascal's phrase "the heart has its reasons, which reason does not

know,"³³⁴ this is a fundamental rejection of all forms of heart-brain dualism.

Schoenberg expresses a view that is virtually indistinguishable from

Wittgenstein's position:

the logical positivists were unambiguous in their desire to keep rational discourse free of emotional content, it would be inaccurate to describe them as "heartless rationalists" (a characterization that has occasionally been promoted by their critics). Politically, for example, most positivists tended toward the left. This is an aspect of their position that has not always been appreciated. The members of the Vienna Circle were highly motivated in their desire to put to rest, once and for all, what they felt were feeble modes of thought that underlaid so many political ideologies. They saw fascism and Nazism, which had wreaked so much havoc on humanity, as consequences of the untenable metaphysical philosophies and ideologies upon which Romanticism was founded. Otto Neurath declares himself to be a committed socialist ("Personal Life and Class Struggle," in Empiricism and Sociology, ed. M. Neurath and R. S. Cohen [Dordrecht, Holland: Reidel, 1973]). Carnap claimed that his political views were identical to those of Neurath: "If you want to find out what my political views were in the twenties and thirties, read Otto Neurath's books and articles of that time: his views were also mine" (Empiricism and Sociology, ed. M. Neurath and R. S. Cohen [Dordrecht, Holland: Reidel, 1973], xiii). See also George Reisch, "From the Life of the Present to the Icy Slopes of Logic: How the Cold War Killed Logical Empiricism," Paper presented to the Humanities Colloquium, Illinois Institute of Technology, Spring 2001.

³³³ Engelmann, *Letters*, 89.

³³⁴ "Le coeur a ses raisons, que la Raison ne connaît point" (Blaise Pascal, *Pensées*, 1670). In another striking anticipation of Wittgenstein, Pascal wrote: "Reason's last step is the recognition that there are an infinite number of things which are beyond it" (cited in Peter Kreeft, *Pascal's Pensées Edited*, *Outlined and Explained* [San Francisco: Ignatius Press, 1993], 238). [There is a] misconception . . . that the constituent qualities of music belong to two categories as regards their origin: to the heart or to the brain.³³⁵

The world of feelings is quite inseparable from the world of the intellect; the two are always felt as one and the same.³³⁶

It seems to me that I anticipated the solution to this problem in the very beginning of this essay with the quotation from Balzac: "The heart must be within the domain of the head."... It is not the heart alone which creates all that is beautiful, emotional, pathetic, affectionate, and charming; nor is it the brain alone which is able to produce the well-constructed, the soundly organized, the logical, and the complicated. First everything of supreme value in art must show heart as well as brain. Second, the real creative genius has no difficulty in controlling his feelings mentally; nor must the brain produce only the dry and unappealing while concentrating on correctness and logic.³³⁷

This is a uniquely balanced stance, one which grew out of the emphasis

that both Schoenberg and Wittgenstein place on the notion of the limits of language. In affirming that there is "something hidden" which underlies art (especially modernist art, for Schoenberg), something beyond the limits of language but which nonetheless guides our thought and behaviour, Schoenberg

and Wittgenstein give voice to "one of the central and most seductive ideas of

aesthetic modernity."338 The only thing that can be said about such a hidden

³³⁵ "Heart and Brain in Music [1946]," in Style and Idea, 54.

³³⁶ "Theory of Form [1924]," in *Style and Idea*, 255.

³³⁷ "Heart and Brain in Music [1946], in *Style and Idea*, 75. "The possession of a brain," Schoenberg laments, "is considered a danger to the naiveté of an artist by many pseudohistorians" ("New Music, Outmoded Music, Style and Idea [1946]," in *Style and Idea*, 121–22).

³³⁸ Peters and Marshall, "Terry Eagleton: Wittgenstein as Philosophical Postmodernist," 27. This over-arching theme can be identified not only in the thought of Schoenberg and Wittgenstein, but in that of other celebrated turn-of-the-century Jewish intelligentsia: Marx, Freud, Kafka and Kraus (see fn. 299, above).

agent, of course, is that it is immune to rational discourse. Necessarily lacking in vocabulary, human culture has assigned a variety of names to this mysterious entity: "spirit," "heart," "emotion," "insight," "transcendence," "the irrational," "the mystical," "God." Although neither Schoenberg nor Wittgenstein could be called "a religious man" in the conventional sense,³³⁹ in their acknowledgment of the role of such an agent both expressed a similarly unique and personal form of mysticism, a conception of "something higher, beyond."³⁴⁰ We have seen that Schoenberg's mystical religiosity is expressed in the themes of *Moses and Aron* (see above, p. 104). Engelmann wrote that in the *Tractatus*, "logic and mysticism have sprung from one and the same root, and it could be said . . . that Wittgenstein drew certain logical conclusions from his fundamental mystical attitude to life and the world."³⁴¹

In recent musicology, there has been increased interest in the irrational aspects of creating, analyzing, and listening to music.³⁴² Excerpts from the

³⁴¹ Engelmann, *Letters*, 97.

³³⁹ "I am not a religious man," Wittgenstein is reported to have said, "but I cannot help seeing every problem from a religious point of view" (M. O'C. Drury, "Some Notes on Conversations with Wittgenstein," in *Recollections of Wittgenstein*, ed. Rush Rhees [Oxford: Oxford University Press, 1984], 79).

³⁴⁰ "Letter to Kandinsky (July 20, 1922)," in *Arnold Schoenberg: Letters*, ed. Erwin Stein, trans. E. Wilkins and E. Kaiser (London: Faber & Faber, 1964), 70–71. See also White, *Schoenberg and the God-Idea*.

³⁴² This movement stands opposed to the positivist's claim that propositions which are neither analytic nor synthetic are simply emotive "gibberish," inherently non-cognitive logical nonsense. A growing community of musicologists has argued that all experience, and all assertions – perhaps *especially* emotional and subjective ones – are meaningful and should be open to inqui y and analysis. For example, see Guck, "Music Loving," 201-212.

writings of Rose Subotnik are representative of this new reverence for irrationality that is characteristic of much of the new music criticism:

What raises a series of musical sounds into the region of music proper and above the range of physical experiment is something free from external constraint, a spiritualized and therefore incalculable something.³⁴³

[Music has an] ability to express, project, or evoke a good deal besides a commitment to its own logic. . . . The rational substratum of musical knowledge rests finally on some act, choice, or principle which is not itself rationally demonstrable.³⁴⁴

The call for this perspective emerged largely in response to the predominantly positivistic and formalistic discourse that had dominated musicology in the post-war years.³⁴⁵ It is surprising, then, to discover that many composers in the generation following Schoenberg also embraced the idea of music's irrational component, in spite of their near obsession with procedures that imposed rational and systematic controls over their materials. Even such a committed total-serialist as Pierre Boulez would describe great art as "a mixture of the rational and the irrational; the two are like a knot that is impossible to untie."³⁴⁶ Boulez describes an ineffable aspect of music's nature and value, one which transcends language and analysis:

Let me refer to Diderot who once wrote very strikingly about how to approach a work of art. First, it is unknown to you, and you are in the dark – you just have a

³⁴⁴ Ibid., 114–16.

³⁴³ "Toward a Deconstruction of Structural Listening, 92.

³⁴⁵ Kerman, Contemplating Music; idem., Musicology.

³⁴⁶ Pierre Boulez, "The Composer and Creativity," *Journal of the Arnold Schoenberg Institute*, 11/2 (November, 1988), 122.

certain feeling for it. Second, you analyze it and therefore become familiar with its structure. But if you go further than that, you again find yourself in darkness because you did not really find an explanation for the irrational aspect of the work. . . . So you approach a work in the dark, you become familiar with it, and then you lose it again. You know, and finally, you do not know. That is encouraging, because if analysis could lead to complete knowledge I think both of you [you and the composer] would soon be in despair.³⁴⁷

We must not assume from any of the foregoing that the idea of aspiring to leap across "Wittgenstein's Stop," beyond the limits of language, applies exclusively to the arts. Indeed some have argued that *all* truly creative thought depends on just such a leap. Ironically, perhaps the clearest statement of this position, and the most incisive and stinging indictment against rigid and doctrinaire positivism, came from Friedrich Waismann, a member of the Vienra Circle.³⁴⁸ Although Waismann agreed with most of the fundamental aspects of the Vienna Circle's approach, he reflected later in life on their position and concluded that it underestimated the role of some crucial ingredients: irrational insight and creative thought. Waismann held that all inspiration is ultimately irrational in nature:

There is nothing like clear thinking to protect one from making discoveries. It is all very well to talk of clarity, but when it becomes an obsession it is liable to rip the living thought in the bud. This, I am afraid, is one of the deplorable results of logical positivism, not foreseen by its founders, but only too striking in some of its followers. Look at these people, gripped by a clarity neurosis, haunted by fear, tongue-tied, asking themselves continually, 'Oh dear, now does this make perfectly good sense?' Imagine the pioneers of science, Kepler, Newton, of field physics, the unconscious, matter waves or heaven knows what, imagine them

³⁴⁷ Ibid., 111.

³⁴⁸ Waismann had studied mathematics with Hans Hahn, and philosophy with Vienna Circle founder Moritz Schlick, at the University of Vienna. He became Schlick's scholarly assistant and librarian, and he regularly attended and organized meetings of the Vienna Circle.

asking themselves this question at every step – this would have been the surest means of sapping any creative power. No great discoverer has acted in accordance with the motto, 'Everything that can be said can be said clearly.' And some of the greatest discoveries have even emerged from a sort of primordial fog. Something has to be said for the fog. ³⁴⁹

Theorists often express frustration with a certain lack of clarity, an almost reverie-like quality, that sometimes enters Schoenberg's prose. We are perhaps surprised to discover that a composer who demanded such precision of himself in matters of compositional technique could lapse into passages of such imprecision in verbal expression. Schoenberg even seems to acknowledge this tendency, but grants it a kind of legitimacy as an inevitable consequence of trying to write about the ineffable in music. Citing Schopenhauer, he writes:

The composer reveals the inmost essence of the world and utters the most profound wisdom in a language which his reason does not understand, just as a magnetic somnambulist gives disclosures about things which he has no idea of when awake – even he loses himself later when he tries to translate details of this language *which the reason does not understand* into our terms. ³⁵⁰

³⁴⁹ Friedrich Waismann, "How I See Philosophy," in *Logical Positivism*, ed. A. J. Ayer (New York: The Free Press, 1959), 359–60.

³⁵⁰ Schopenhauer, *The World as Will and Representation*, Vol. I, 260. Cited in Schoenberg, "The Relationship to the Text [1912]," in *Style and Idea*, 141–42. (Emphasis added by Schoenberg.)

119

Concerning matters of creativity and inspiration, Schoenberg seems to be drawing attention to the same inexpressible quality in musical insight that Waismann perceived in scientific insight: "something has to be said for the fog."

Chapter 4: Problems of Formalism

VIENNA-CIRCLE CONVENTIONALISM: THE AUTONOMY OF LANGUAGE AND LOGIC

Above all else, it was Wittgenstein's novel formalistic perspective on logic that had so impressed the members of the Vienna Circle. According to their testimony, this aspect of Wittgenstein's thought was the historical watershed that first made consistent and logical empiricism possible. Vienna Circle historian Victor Kraft writes:

The Vienna Circle knew how to combine Wittgenstein's insight concerning the analytic *a priori* nature of logic and mathematics with empiricism. This constitutes a fundamental revision of empiricism, and the solution was immensely significant.³⁵¹

From the *Tractatus* the Vienna Circle took Wittgenstein's conception of logic as a self-enclosed and water-tight system and made it the centerpiece of their analysis of the language of science.³⁵² They held that the logical underpinnings of scientific theories were tautologies, analytic truths, and the consequences of linguistic conventions. These truths are factually empty because they follow merely from rules for using the symbols of language. They are true only *by convention*, they are "ways of speaking" about empirical phenomena. This hallmark conception of the Vienna Circle is a doctrine that is sometimes described as "the linguistic theory of *a priori* truth" or, simply,

³⁵¹ Kraft, *The Vienna Circle*, 23. Kraft notes that this development was closely documented through the 1930s in the journals *Philosophy of Science* and *Journal of Symbolic Logic*.

³⁵² Baker, Wittgenstein, Frege and the Vienna Circle, 209.

"conventionalism."³⁵³ The Circle declared every proposition whose truth is independent of experience to be analytic, true only by virtue of the conventions that assign meaning to its constituent terms. This dissolved the traditional empiricist's embarrassment about *a priori* knowledge. Just as to know that all bachelors are unmarried is to know nothing, so the language underlying all scientific theories is conventional and tautological.³⁵⁴ Waismann, Hahn, Carnap, and Schlick felt that the revolution proclaimed by the *Tractatus* centered on its tautological conception of the logical propositions underlying science, i.e., that the rules of logic say nothing about objects "but only stipulate rules for speaking about objects."³⁵⁵ According to this view, scientific theories are therefore merely elaborations upon an enclosed "system" (that of the logic underlying language) that, in itself, says nothing about the world. From this emerged the possibility of scientific relativism, the possibility of multiple geometries (Euclidean,

³⁵⁴ Baker, Wittgenstein, Frege and the Vienna Circle, 219.

³⁵⁵ Ibid., 207.

³⁵³ "In the philosophy of science, 'conventionalism' is the view that physical laws (theories, hypotheses) are convenient shorthand expressions (conventions) for organizing and explaining; experience. Other expressions can be found – and will be found – which perform similar tasks. Thus physical laws are postulates; they are not absolute. They are relative to our framework of knowledge and to our technology. They cannot reveal reality as it is in itself but reveal only what and how consciousness puts things in relationships. They are commonly accepted in scientific circles because they bring about simplicity of explanation, control, comprehensiveness of understanding, prediction, and ways to deduce further concepts than can competing laws. Physical laws are subject to revision and ultimately will be abandoned if they cannot perform these functions (compare with "Instrumentalism"). In logic, conventionalism is the view that the truths and principles of logic are arbitrary conventions agreed upon in order to build up a formal system. No one set of axioms (or rules of inference, or postulates, or conceptual method) is primary and fundamental to all logical systems. The truth of axioms in a logical system is a matter of conceptual agreement as to where to begin and how to proceed" (Angeles, *Dictionary of Philosophy*, s.v. "Conventionalism"). See also Baker, *Wittgenstein, Frege and the Vienna Circle*, 236-68.

Riemannian, etc.), multiple accounts of the laws of physics (including Newton's, Einstein's, etc.), and so on.³⁵⁶ The implications and consequences seemed staggering!

In chapter 2, we encountered a form of epistemological conventionalism in Schoenberg's theoretical thinking. This was the point he had tried in such earnest to press upon his readers. For Schoenberg, the "truths" that Schenker and traditional theorists wrote about are factually empty because they follow merely from a particular set of conventions for the use of language. He claimed that traditional theory is just a "way of speaking" about harmonic phenomena, its truths, therefore, are only *true by convention*. Wittgenstein and the Vienna Circle wanted to show how theories and philosophies of science are simply ways of moving around within our own grammar. According to this view, many philosophical questions can be dissolved by examining the rules for the use of words with which we are familiar. Schoenberg wanted to show how theories of

³⁵⁶ A cautionary note: Einstein himself was a firmly-committed realist, he was not a scientific conventionalist. Einstein's demonstration that there is not a one-to-one correspondence between experienced space and objective space in no way diminished his faith in an independent reality: "The views of space and time which I lay before you have sprung from the soil of experimental physics, and therein lies their strength. They are radical. Henceforth space by itself, and time oy itself, are doomed to fade away into mere shadows, and only a kind of union of the two *will preserve an independent reality*" (*The Principles of Relativity: A Collection of Original Memoirs on the Special and General Theory of Relativity* [*Das Relativitätsprinzip*, 1922], trans. Hendrik A. Lorentz [New York: Dover, 1952]). In short, contrary to a conclusion one might hastily draw from his employment of the term "relativity," Einstein was a committed realist. A relationship between Einstein's thought and that of the Vienna Circle is nonetheless evident when he observes: "Insofar as the principles of geometry are valid, they do not refer to reality, insofar as they refer to reality, they are not strictly valid" (*Geometrie und Erfahrung*, cited in English translation in Schlick, *General Theory of Knowledge*, 355).

music are largely ways of moving around within our own grammar. According to this view, many music-theoretical questions can be dissolved by examining the rules for the use of words and concepts with which we are familiar.

Wittgenstein may have been an honorary figurehead for the Vienna Circle, but they did not agree with him on all matters. In fact, when the group first met in 1927 for a series of discussions with the towering figure whose work had mear t so much to them,³⁵⁷ members of the Circle reported that, to their astonishment, the sessions were more frustrating and puzzling than edifying. Wittgenstein, too, confided to a friend that "each of us thought the other mad!"³⁵⁸ "To the positivists," writes Wittgenstein biographer Ray Monk, "clarity went hand in hand with the scientific method, and, to Carnap in particular, it was a shock to realize that the author of the book they regarded as the very paradigm of philosophical precision and clarity was so determinedly unscientific in both temperament and method."³⁵⁹ "His point of view and his attitude toward people and problems, even theoretical problems," Carnap wrote, "were much more similar to those of a creative artist than to those of a scientist."³⁶⁰ Following a respectful introductory session, the

³⁵⁷ Monk, *Ludwig Wittgenstein*, 241–46. Wittgenstein had corresponded regularly with members of the group for a number of years (with Schlick in particular), but he did not meet with them formally, as a group, until 1927.

³⁵⁸ Engelmann, Letters, 118.

³⁵⁹ Monk, Ludwig Wittgenstein, 244.

³⁶⁰ Carnap, "Intellectual Autobiography," 25. Hans-Johann Glock concurs: "Wittgenstein strongly resented scientism and ... was firmly convinced of the superiority of the artistic spirit"

divisions between Wittgenstein and the Circle became increasingly evident. Gordon Baker has observed that the ideas that had once seemed to form such a strong allegiance between the Vienna Circle and Wittgenstein may not have been much more than "a thin crust over a deep crevasse."³⁶¹

We have seen that one of the things that starkly differentiates Wittgenstein's view from that of the Vienna Circle is his assertion that those things that "cannot be said" (i.e., concerning the nature of the good in ethics, values, and aesthetics) are precisely those things that matter most in life. Given their positivist heritage, most members of the Vienna Circle saw things quite differently. After all, "removing the metaphysical debris of millennia," excluding pseudo-science, and ridiculing the possibility of all forms of non-scientific reasoning were central commitments for the Vienna Circle, as they were for the entire positivist movement.³⁶² They felt that since language and logic could not in any way "capture" the underpinnings of aesthetic and ethical propositions, they constitute meaningless nonsense.³⁶³

("Wittgenstein and Reason," in *Wittgenstein: Biography and Philosophy*, ed. James C. Klagge [Cambridge: Cambridge University Press, 2001], 209).

³⁶¹ Baker, Wittgenstein, Frege and the Vienna Circle (Oxford: Blackwell), 242.

³⁶² Peter Galison, "Aufbau/Bauhaus: Logical Positivism and Architectural Modernism," *Critical Inquiry*, 16 (Summer, 1990): 732.

³⁶³ It is important to reiterate that while all positivists exclude the notion of non-scientific and non-fact-based "reasoning," some positivists allowed that subjects such as ethics, religion, and aesthetics are nonetheless worthy of serious attention and reflection. Ayer, Neurath, and Waismann, for example, followed Wittgenstein's lead in this respect (Ayer, *Wittgenstein*, 87).

Another central issue differentiating Wittgenstein's thought from that of the Vienna Circle can be illustrated with reference to the domain of geometry. For the Vienna Circle, geometry is a "theoretical" and logical domain, hence it is linguistic and purely conventional. Their view was aligned with that of David Hilbert (1862-1943), the "meta-mathematician" for whom the primitive concepts and propositions of Euclidean geometry are self-contained because they can be completely understood independent of the description or manipulation of the shapes and spatial relations of physical objects.³⁶⁴ Viewed from this perspective, the concepts of pure geometry are *purely syntactical* and totally divorced, in themselves, from empirical reality. In the early 1930s, Wittgenstein had himself described arithmetic and geometry as "rules of syntax."³⁶⁵ But at no time did he isolate geometric "rules of grammar" from their application. On the contrary, Wittgenstein considered Euclidean geometry to be a system of rules for the *use* of such terms as "point," "line," circle," triangle," "the same length," etc., in *empirical propositions* (i.e., in synthetic propositions). Similarly, according to this view, arithmetic sets out rules for applying "number-words" in formulating the results of counting and measuring activities. For Wittgenstein, it is the applications of the symbols that differentiate arithmetic or geometry from mere

³⁶⁴ David Hilbert, Foundations of Geometry [Grundlagen der Geometrie, 1899], trans. Leo Unger (LaSalle: Open Court, 1971). Hilbert calls his formalistic conception of mathematics and geometry "meta-mathematics." See Kraft, *The Vienna Circle*, 48; John D. Barrow, *Pi in the Sky – Counting, Thinking, and Being* (New York: Penguin, 1993), 190.

³⁶⁵ Baker, Wittgenstein, Frege and the Vienna Circle, 242.

games; i.e., the *sense* of a mathematical or geometric proposition *is* its application. Hempel later called this "the semantical interpretation of pure geometry."³⁶⁶ According to Wittgenstein, arithmetic and geometry may be analytic systems embodying conventions, but they are not *just* conventions. They are conventions whose meaning depends upon their application.³⁶⁷ Arithmetic is a system of rules (in the form of descriptions) for the transformation of empirical propositions about the number, or quantity, or magnitude, of things. The propositions of geometry are not descriptions of the properties of space, but are rather constitutive rules for the description of spatial relations (i.e., they do not describe space, but rather they describe rules for describing space). Wittgenstein stressed the necessity of "seeing" how the propositional calculus of the Tractatus could be applied to real-life and real-world situations. One of the central themes of the *Tractatus* concerns this word-to-world correspondence. That is, while the particular rules and forms of linguistic representation are themselves independent from reality, language, for the early Wittgenstein, is ultimately answerable to empirical reality for its meaning. (Later in the chapter I will discuss other elements of empiricism in Wittgenstein's thought.)

³⁶⁶ Hempel, "Geometry and Empirical Science," 123.

³⁶⁷ Baker, *Wittgenstein, Frege and the Vienna Circle*, 242. These are issues which Wittgenstein explores further in Wittgenstein's *Remarks on the Foundations of Mathematics*, 1937-39, ed. G. H. von Wright, R. Rhees, and G. E. M. Anscombe, trans. G. E. M. Anscombe (Cambridge: M.I.T. Press, 1972). See also *Lectures on the Foundations of Mathematics, Cambridge* 1939, from the notes of R. Bosanquet, N. Malcolm, R. Rhees, and Y. Smythie (Ithaca, N.Y.: Cornell University Press, 1976).

Finally, unlike many members of the Vienna Circle (Carnap, for example), the early Wittgenstein could not countenance the notion of an *alternative* logic (i.e., a hypothetical logical calculus or New Logic that stands in relation to the old logic as a non-Euclidean geometry stands to the Euclidean system).³⁶⁸ The message of the *Tractatus* is that in logic there are no options: there is simply *one logic*, and in every language it is the same.³⁶⁹ Many of the positivists embraced a more flexible theory of the structure of language. They regarded language as a system of signs governed by conventional rules, and they felt that there need be no *a priori* limitations on the kinds of linguistic rule-systems that can be instituted (certainly no *a priori* limitations of the stringent sort presented in the *Tractatus*) ³⁷⁰ Carnap rejected Wittgenstein's idea that there must be a single logical form to

³⁷⁰ Gary Ebbs, Rule-Following and Realism (Cambridge Mass.: Harvard University Press, 1997).

³⁶⁸ Carnap sketches a practically infinite series of possible logical languages. See Rudolf Carnap, "The Old and the New Logic," in *Logical Positivism*, ed. A. J. Ayer (New York: Free Press, 1959), 133–46; idem., "*Testability and Meaning (I)*," *Philosophy of Science*, 3 (1936), 419–71; idem., "*Testability and Meaning (II)*," *Philosophy of Science*, 4 (1937), 2-40.

³⁶⁹ Baker, *Wittgenstein, Frege and the Vienna Circle*, 216. While our focus must remain exclusively on the early Wittgenstein, it is important to note that he completely revised this position toward the end of his life. In the *Philosophical Investigations* (1953), Wittgenstein introduces the pivotal notion of "language-games," a concept which he used to dismiss the idea that logic is prior to all experience and underlies the *a priori* order of the world. The reflections which led him to write the *Philosophical Investigations* called for a radical reversal of this aspect of the framework he had established in the *Tractatus*. In the *Philosophical Investigations* he wishes us to see logic – the difference between sense and nonsense – as something that is learned when, through taking part in a social life, we come to speak a language. On this view, logic is not to be found "outside" language but only within the various "language games" themselves. Therefore "the sense of any language-game cannot itself be questioned, since one could do so only on the assumption which Wittgenstein now rejects, that logic lies 'outside' it" (H. O. Mounce, "Understanding a Primitive Society," *Philosophy*, 48 [1973], 349). Russell's low opinion of the *Philosophical Investigations* was largely due to Wittgenstein's reversal of the position taken in the *Tractatus* on the question of the universal nature of logic (see fn. 228, above).

language and never took seriously his claim that the tautologies of language required commitment to such a single logical form.³⁷¹

In the late 1930s, with the onset of World War II, political pressures were brought to bear against the Vienna Circle, and it disbanded, many of its members fleeing to the United States, and a few to Great Britain.³⁷² Unlike so many other intellectual threads that were broken by the war, however, the influence of the Vienna Circle did not end there. The extent and breadth of their continuing influence has been considerable:

The most important names associated with rationalism and experimental science at the turn of the century were grouped around the Vienna Circle. As the twentieth century progressed these positivists increasingly functioned as unelected legislators who defined the terms of the intellectual debate . . . [they] assumed a sort of hegemonic role in scientific and academic affairs.³⁷³

From a small group in Vienna, the movement soon expanded to include an international following, and in the sixty years since has exerted a powerful sway over the conduct of the philosophy of science as well as over wide branches of philosophy, economics, psychology, and physics.³⁷⁴

³⁷¹ Carnap, "On the Character of Philosophical Problems," in *The Linguistic Turn*, ed. Richard Rorty (Chicago: University of Chicago Press, 1975), 60. See also Richard M. McDonough, *The Argument of the Tractatus* (Albany: State University of New York Press), 9.

³⁷² The political circumstances which lead to the disintegration of the Vienna Circle are well described in Galison, "Aufbau/Bauhaus: Logical Positivism and Architectural Modernism," 741–49.

³⁷³ David J. Peterson, *Revoking the Moral Order: The Ideology of Positivism and the Vienna Circle* (New York: Lexington Books, 1999), 149.

³⁷⁴ Galison, "Aufbau/Bauhaus: Logical Positivism and Architectural Modernism," 709.

THE AUTONOMY OF MUSICAL LANGUAGES: CREATING WORLDS OF OUR OWN MAKING

In the preceding discussion of Wittgenstein, the Vienna Circle, and the logical underpinnings of language and science, music theorists will recognize many of the central themes that have increasingly preoccupied twentieth-century music theory. In particular, the question of the self-sufficiency or "autonomy" of harmonic languages – the "freedom to posit axioms" – has been problematic. 375 Wittgenstein stated that tautology is the defining characteristic of the rulegoverned logical system that underlies language, and the Vienna Circle built their conception of conventionalism on this premise. Schoenberg independently arrived upon a similar conclusion about musical language, asserting that composers could avail themselves of a myriad of possible rule-governed systems.³⁷⁶ "System" is one of the most ubiquitous words encountered throughout Schoenberg's writings.³⁷⁷ The conclusion that harmonic languages are self-contained axiomatic "systems" can be derived from all of his writings on the subject, not only in reference to his twelve-tone *system*, but concerning harmonic theories in general.³⁷⁸ The nature of Schoenberg's engagement with the notion of "system" bears a strong affinity to that of Wittgenstein and the

³⁷⁵ See fn. 101, above.

³⁷⁶ "Problems of Harmony [1934]," in Style and Idea, 268-87.

³⁷⁷ The word "system" is employed repeatedly throughout *Hamonielehre, Style and Idea*, and *The Musical Idea*. It was Schoenberg's "favourite word," according to Leonard Stein (Maiko Kawabata, "Schoenberg at UCLA: Reminiscences from Leonard Stein," *Echo*, 2/2 [Fall, 2000]: 7).

³⁷⁸ See my description of Schoenberg's conception of *Darstellungen* (p. 19, above).

Vienna Circle as they sought to formulate the fundamental tenets underlying analytic philosophy, conventionalism, and logical positivism.

Thomas Harrison understands this aspect of Schoenberg's thought in relation to the aesthetic tenets of expressionism: "The inevitable consequence of the quest for self-expression is the dissolution of subjectivity into pure composition, into a 'necessary' form of rhetoric with neither everyday nor metaphysical cogency."³⁷⁹ Kandinsky expresses the question that lies at the core of the new aesthetic starkly: "cold calculation . . . mathematically exact construction, is this not form?"³⁸⁰ Hanslick's conception of a wholly nonreferential musical logic also seemed to suggest a kind of abstract formalism:

Whatever the sentimental composer produces and whatever the ingenious one, be it elegant or sublime, music is, first and foremost, objective structure.³⁸¹

In music there is both meaning and logical sequence, but in a musical sense; it is a language we speak and understand, but which we are unable to translate.³⁸²

Art historian Suzi Gablik has likened abstract painting to an uninterpreted formal system that conveys no "information" and has no connection with the world. She asks us to understand post-expressionist and modernist paintings as

³⁸² Ibid., 30.

³⁷⁹ 1910: The Emancipation of Dissonance, 177.

³⁸⁰ "Foreword to the Catalogue of the Second Exhibition of the *Neue Künstler-Vereinigung Munich* [1910]," in *Complete Writings on Art*, ed. Kenneth C. Lindsay and Peter Vergo (New York: Da Capo Press, 1994), 82. It should be noted that Kandinsky met (and corresponded) with Carnap on several occasions (see Galison, "Aufbau/Bauhaus: Logical Positivism and Architectural Modernism," 737-40).

³⁸¹ On the Musically Beautiful, 47.

purely formal, logical, and rule-governed "systems."³⁸³ Works of art, for Gablik – like geometry for Hilbert and scientific theories for the Vienna Circle (inspired by their reading of Wittgenstein) – must be understood as formal systems that have no possibility of interpretation beyond their own terms. Schoenberg (after Hanslick) also denied that the elements of music have *reference* to anything beyond themselves (and that music can have "meaning" in that sense). However, as we saw in chapter 2, neither Hanslick nor Schoenberg seemed to be proposing a wholly formalistic view of musical language. They held to a more moderate, more empiricist, and ultimately more realist position that I have described with reference to "the Icarus principle." Their reservations are comparable to those of Wittgenstein concerning some of the Vienna Circle's more abstractly formalistic conceptions of language. I will return to this argument below.

At this point I would like to insert a word of caution against over-facile comparisons between the abstractionist movement in the *visual* arts and the form of abstraction that was nascent in the advent of *musical* modernism. Despite the sympathy Schoenberg may have felt for the thrust of the abstractionist movement in the visual arts, he knew that sound and music differed fundamentally from the visual arts with respect to the theory of representation. In the visual arts, "abstraction" meant exploring the qualities of form, line, colour and surface fo:

³⁸³ Progress in Art (New York: Rozzoli, 1977).

their own sake, instead of depicting subjects from life or nature. What was sought was the emancipation from the imitative, representational, figurative, realist, and naturalistic depiction of the world, and the consequent freedom to exploit the patterns and interactions of pure forms and colours on the canvas. This perspective was not new for music. Hanslick's view – that music is and has always been pure form, the paradigmatically non-representational art form – had come to predominate among music theorists in the early twentieth century. In a rare reference to music, even Carnap writes that it "is the purest means of expression because it is entirely free from any reference to objects."³⁸⁴ This is what inspired Kandinsky to employ musical metaphors so often, speaking of the "rhythm" and "harmonies" created by visual forms and colours.³⁸⁵ Music's nonrepresentational and intangible nature also explains why the study of musical composition has been historically more theory-laden than the study of "composition" in the visual arts. "Music does not simply have instruction in its craft and techniques, as does painting," Schoenberg laments, "music has, rather, Instruction in Theory."³⁸⁶ He raises the same issue in relation to carpentry:

³⁸⁴ Carnap, "The Elimination of Metaphysics," 80.

³⁸⁵ Vassily Kandinsky, Über das Geistige in der Kunst (Munich: Piper Verlag, 1912), 19. See also Kandinsky's *Sounds* [Klänge, 1912], trans. Elizabeth R. Napier (New Haven, Conn.: Yale University Press, 1981).

³⁸⁶ *Theory of Harmony*, 7. Schoenberg uses capitalization here to convey an ironic tone.

"Musical composition is 'more theoretical' than carpentry.... The carpenter could never understand his craft in a merely theoretical way."³⁸⁷

What is new and unique in *musical* abstraction in the twentieth-century is thus not its non-representational nature – music was never representational in the way that the visual arts were – but rather its ever-increasing dependency on theoretical models, accompanied by an ever-increasing tenuousness in the linkage between acoustic and perceptual laws and the theoretical concepts involved in the organization of music. For the radical formalist, a musical language needs no empirical anchor beyond the terms of its own analytic frame of reference.³⁸⁸ It is my contention that Schoenberg has been wrongly held responsible for the promotion of this view. His praise of the focus on "craft" that is characteristic in the visual arts, and his lament for the pride of place that theory has occupied in music, reveal Schoenberg's reluctance to divorce his thinking from the inescapable "materiality" of music. Carpenter and Neff observe that "Schoenberg aspired to account for the connection between the immaterial idea,

³⁸⁷ Ibid., 7.

³⁸⁸ This level of abstraction is much more rare in the visual arts. Painters and sculptors tend to be deeply concerned with the pre-creative "given" nature of their "materials" and the laws and processes governing perception and cognition. Twentieth-century visual artists have been much more inclined (than twentieth-century composers) to see these issues as paramount and form-determining — as the point of departure and *sine qua non* upon which creative activity builds. For example, see Rudolph Arnheim, *Art and Visual Perception* (Berkeley and Los Angeles: University of California Press, 1965).

the life-giving principle that stood behind his own artistic life and creation, and the concrete materialized musical work."³⁸⁹

Although we must not lose sight of these critical qualifications, neither can we ignore the elements of formalism in Schoenberg's conception of musical language. The idea that it is the composer's obligation to invent a musical language is manifest in Schoenberg's entire compositional and theoretical career. In striking parallel with Wittgenstein's conception of language, Schoenberg thought that music was largely *about* some aspect of its own structure. Joseph Swain contrasts Schoenberg's approach to that of a composer such as Debussy, "who is one of the greatest innovators of his age, but not the author of an artificial language."³⁹⁰ Swain writes:

The artificial languages of twentieth-century composition are by far the most prominent feature on the face of its troubled history, and nothing else has so greatly affected the character of that history. . . . After Schoenberg, a composer cannot hope to win distinction merely by creating within an accepted tradition; a great composer must invent a new language. An architect in an analogous situation could no longer be content with designing new, even radically innovative buildings, but must invent entirely new principles of engineering.³⁹¹

³⁸⁹ Carpenter and Neff, Commentary on *The Musical Idea*, 74.

³⁹⁰ Swain, *Musical Languages*, 136. According to Swain's account, the modernist fascination with this kind of explicit artificial language-making in music grew directly from the nineteenth-century preoccupation with the composer's personal stylistic individualism: "The dictum that every composer must create an individual style to establish credentials as Artist is so widely taken for granted in the modern world that it is worth emphasizing how recently the Western community has demanded this kind of originality" (p. 121).

³⁹¹ Swain, *Musical Languages*, 119–22. For corroborating views, see Carl Dahlhaus, *Analysis ana Value Judgment*, trans. Siegmund Levarie (Stuyvesant, N.Y.: Pendragon Press, 1983), 17; Subotnik, "Toward a Deconstruction of Structural Listening," 89.
Van den Toorn concurs: "The music of Schoenberg and his successors stresses the self-enclosure of the systems. No longer ostensibly a form of shared or communal expression, composition could now be viewed as a form of self-indulgence."³⁹²

Wittgenstein is said to have been fond of citing Schopenhauer's dictum that "music is a world in itself."³⁹³ This aspect of musical modernism – its intense focus on creating "artificial worlds" (Goodman's "worldmaking" or Covach's "worlding")³⁹⁴ – gave rise to the cultivation of a unique form of hubris, a kind of "God-complex," among some of the composers in the generation following Schoenberg. Karlheinz Stockhausen, for example, viewed composition "not as the expression of human feelings and passions," according to biographer Michael Kurtz, "but rather as an attempt at a re-creation, a reconstitution of cosmic order."³⁹⁵ The theme of self-circumscribed enclosure characterizes the period not only in analytic philosophy and modernist formalism, but also in the literature and moral philosophy of existentialism.³⁹⁶

³⁹⁵ Michael Kurtz, Stockhausen: A Biography, trans. R. Toop (London: Faber & Faber, 1992): 41.

³⁹² Pieter Van den Toorn, "What Price Analysis," Journal of Music Theory, 33 (Spring 1989): 169-70.

³⁹³ Drury, "Ludwig Wittgenstein Symposium (II)," 164.

³⁹⁴ Nelson Goodman, *Ways of Worldmaking* (Indianapolis, Indiana: Hackett, 1978); John Covach, "Schoenberg's Turn to an 'Other' World," *Music Theory Online*, 1.5 (1995); idem., "The Sources of Schoenberg's 'Aesthetic' Theology," *Nineteenth-Century Music*, 19/3 (1996): 252–62; idem., "Schoenberg and the Occult: Some Reflections of the Musical Idea," *Theory and Practice*, 17 (1992): 103–18.

³⁹⁶ For example, see Jean-Paul Sartre's *Huit clos*. Pierre Boulez describes his own music very much as Sartre might describe man's existential dilemma: "When I approach a work I have written myself I am rather in darkness. Then I try to analyze it to the maximum of efficiency. Then, as I go further, I am again in darkness. I cannot find an explanation for its irrational aspects. It is perhaps because I have constructed a labyrinth, and I think the best work of art is essentially, must be, labyrinthine . . . I think that is exactly what a work of art should do to you: it should in

In the remainder of this chapter I will extrapolate beyond Schoenberg's theory to consider some of the approaches and methodologies to which it has given rise in the latter half of the twentieth century. I will devote special attention to an aspect of twentieth-century harmonic theory that has been widely understood as Schoenberg's legacy: mathematical formalism. The mathematicalmodeling approach to analysis (its set-theoretical branch, in particular) has been challenged for putatively disregarding questions concerning acoustics, perception and cognition, i.e., for lacking in a synthetic foundation.³⁹⁷ Critics have also charged that mathematically-conceived music is generally unable to communicate its structures and qualities beyond a small circle of elite listeners, if at all. They claim that at the core of mathematical formalism lies a form of epistemological "ipse dixitism" (because-I-say-so-ism),³⁹⁸ a tendency for composers and theorists to make dogmatic statements about musical structures by fiat (*ex cathedra* as it were), statements which rest on a presumed "freedom to

³⁹⁸ An expression introduced to ethics by Jeremy Bentham (*Introduction to the Principles of Morals and Legislation*, 1789). Bentham was referring to the circular reasoning of English citizens who tended to assert that English Law was a good thing simply because" they said so."

the end make you feel lost, and you should know you are lost, and that is the important thing" (Pierre Boulez, "The Composer and Creativity," *Journal of the Arnold Schoenberg Institute*, 11/2 [November, 1988]: 121).

³⁹⁷ It should be noted that a number of recent studies have investigated questions pertaining to the perceptibility of structures posited by set theorists. For example, see Michael L. Friedmanr, *Ear-Training for Twentieth-Century Music* (New Haven, Conn.: Yale University Press, 1990); Kate Covington and Charles H. Lord, "Epistemology and Procedure in Aural Training: In Search of a Unification of Music Cognitive Theory and Its Application," *Music Theory Spectrum*, 16/2 (1994): 159–70; David S. Lefkowitz, "Listening Strategies and Hexachordal Combinatorial 'Functions' in Schoenberg's Op. 23, No. 4," *Music Analysis*, 16/3 (1997): 309-48.

posit axioms" rather than on any kind of neutral empirical standard concerning the nature of sound, cognition and perception. Throughout the remainder of this chapter, Wittgenstein's views concerning the foundations of mathematics – the nature of numbers, their cognitive origins, and their application to reality – will be brought to bear on a variety of questions related to set-theoretical formalism in music theory.

RADICAL FORMALISM IN TWENTIETH-CENTURY HARMONIC THEORY

The formalistic implications of both Schoenberg's theory and the music of the Second Vienna School (of Webern, in particular) were aggressively pursued following the Second World War. Since that time, the mathematical formalization of music theory has been pursued by an entire sub-culture of music scholarship. The analysis of twentieth-century music has been an area of special emphasis for mathematical-modeling theory. One of the merits often claimed for formalism in general (and for its set-theoretical branch in particular) is its supposed objectivity and relativism, its concern with "presentational facts" in contrast to the normative universalisms and aesthetic prescriptions of earlier theory.³⁹⁹ Attempts to construct a radically formalistic and relativistic music

138

³⁹⁹ Meyer, *Music, the Arts, and Ideas*, 212. See also Babbitt, "Past and Present Concepts," 3–9.

⁴⁰⁰ Benjamin Boretz, "Meta-Variations I: Studies in the Foundations of Music Thought," *Perspectives* of New Music, 8/1 (1969): 1-74; idem., "Meta-Variations II: Sketch of a Musical System," *Perspectives* of New Music, 8/2 (1970): 49–111; idem., "Meta-Variations III: The Construction of Musical Syntax I,"

Goodman describes Boretz as a "formalist" for whom "the actual structure of the work is all that matters."⁴⁰¹ For Boretz, musical languages and systems need bear no special and necessary relationship with a stable material reality.

Among twentieth-century music theorists, composer-theorist Milton Babbitt has been the most prominent and outspoken proponent of logical positivism. Babbitt has urged theorists to adopt the rigorous language of positivism in order to speak meaningfully *about* music.⁴⁰² With respect to the languages and structures *of* music itself, the notion of "contextuality" has been central to Babbitt's view. For Babbitt, a piece of music is seen as a wholly selfenclosed and self-referential art object. Its principles – its "progressions of relatedness" – are defined within itself.⁴⁰³ Babbitt's essential position is well aligned with that of Joseph Kosuth, who describes the work of art as a kind of tautology, the result of artistic activities that are self-verifying.⁴⁰⁴ A source and

⁴⁰¹ Nelson Goodman, "Reply to Benjamin Boretz," Journal of Philosophy, 67/16 (August, 1970): 567.

⁴⁰² Babbitt, "The Structure and Function of Music Theory," 10–21.

⁴⁰³ Jason Gibbs, "Review of *Words about Music* by Milton Babbitt," *In Theory Only*, 10/8 (1988): 16–17; Milton Babbitt, *Words About Music*, ed. Stephen Dembski and Joseph N. Straus (Madison, Wisconsin: University of Wisconsin Press, 1987), 9, 167.

⁴⁰⁴ Joseph Kosuth, Art After Philosophy and After: Collected Writings 1966-1990 (Cambridge: M.I.T. Press, 1991): 247. See also Kosuth's famous essay "Art After Philosophy: Part I" Studio International , 178/915 (October, 1969): 134–37; "Part II," Studio International, 178/916 (November); 160–61; "Part III," Studio International, 178/917 (December): 212–13.

Perspectives of New Music, 9/1(1970): 23-42; idem., "Meta-Variations III: The Construction of Musical Syntax II," Perspectives of New Music, 9/2-10/1 (1971): 232-70; idem., "Meta-Variations III: Analytic Fallout I," Perspectives of New Music, 11/1 (1972): 146-223; idem., "Meta-Variations IV: Analytic Fallout II," Perspectives of New Music, 11/2 (1973): 156-203.

inspiration for this view may be found in Schoenberg's assertion that to try to "refute" a work of art is an epistemologically illegitimate move. "In the art work there are no mistakes, no false doctrines," he writes, "and for that reason a work of art can never be refuted."⁴⁰⁵

For all its rigour in other respects, Babbitt's theoretical work is characterized by a relative lack of concern for the perceptual status and validity of the math-modeling concepts he applies. Babbitt consistently deflects questions pertaining to the perceptibility of the objects of math-modeling, obstinately preferring to frame the question in terms of the notion that music expresses its meaning through self-referentiality alone. Moreover he insists that "it is not a matter of hearing, it's a matter of the way you think it through conceptually with your musical mind."⁴⁰⁶ As Nicholas Cook has noted, one finds in the writings of Babbitt and Boretz "hardly any direct consideration of the manner in which listeners perceive the structures [that they posit]; the theoretical assumption seems to be that as long as the building-blocks of musical structure — the *qualia* [intervals, for Babbitt] — are perceptible, any structure built out of them ought to be perceptible too."⁴⁰⁷ Cook further points out that, even if Babbitt and Boretz

⁴⁰⁵ *The Musical Idea*, 117.

⁴⁰⁶ Babbitt, Words About Music, 23; Jason Gibbs, "Review of Words about Music by Milton Babbitt," 23.
⁴⁰⁷ Cook, "Music Theory and 'Good Comparison," 121.

occasionally claim to be concerned with perceptual viability,⁴⁰⁸ "the decision as to whether an analytical interpretation 'works' remains a purely intuitive one; the theory itself is not concerned with perception at all."⁴⁰⁹

Babbitt has acknowledged – obliquely, if not in substance – the commor. worldview he shares with those members of the Vienna Circle who favoured a formalistic orientation towards the conceptual foundations of scientific theory. Babbitt's link to the Vienna Circle is a very direct one. Carnap, Gödel, and Hempel were all active at Princeton during Babbitt's formative years there,⁴¹⁰ and it was at Princeton that logical positivism gained its strongest foothold following the wave of emigration of European scholars during the 1940s. James Davis has noted that "positivism found a home at many universities in America. This is perhaps most notable at Princeton, a center for analytic philosophy and positivistic thought, and one of the most influential music schools of the time."⁴¹¹

⁴⁰⁹ Cook, "Music Theory and 'Good Comparison," 138 (n.17).

⁴⁰⁸ For example, see Milton Babbitt, "Twelve-Tone Rhythmic Structure and the Electronic Medium," *Perspectives of New Music*, 1 (Fall, 1962): 50-51. Andrew Mead writes that "despite a reputation to the contrary, Babbitt's music is truly music to be heard" (*An Introduction to the Music of Milton Babbitt* [Princeton: Princeton University Press, 1994], 4). An admirable attempt to address the perennial question of perception versus conception of musical structure is found in David Lewin, *Musical Form and Transformation: 4 Analytic Essays* (New Haven: Yale University Press, 1993), 53-67 (appendix to Lewin's discussion of Boulez's *Klavierstück III*).

⁴¹⁰ Following completion of a B.A. in music at New York University (1935), Babbitt enrolled in graduate study at Princeton, where he studied with Roger Sessions. After a period of compositional activity and association with the music faculty, Babbitt became a member of the Princeton mathematics faculty from 1943 to 1945. In 1948 he rejoined the music faculty and eventually became Conant Professor of Music in 1960.

⁴¹¹ James A. Davis, "Positivistic Philosophy and the Foundations of Atonal Music Theory" (Ph D. Dissertation, Boston University, 1993), 25. Joseph Kerman concurs: "We have seen how under Arthur Mendel Princeton took an explicit lead in positivistic musicology . . . This in turn provided

Babbitt's early works refer to Carnap, Hempel, and Goodman more than any musical sources, and he names Carnap as one of the three most important influences on his intellectual development.⁴¹² Babbitt also cites Hilbert (the "meta-mathematical" formalist)⁴¹³ as well as "the mid-nineteenth-century revolution in mathematics and the twentieth-century revolution in physics" as models for his own approach.⁴¹⁴ One of Babbitt's disciples has compared his explorations to those of Georg Friedrich Bernhard Riemann ("the good Riemann," according to Babbitt), the nineteenth-century mathematician and pioneer of non-Euclidean geometry.⁴¹⁵

The Goodmanian notion of "worldmaking" ("worlding" in Covach's

an important ideological spur to avant-garde compositional theory, which was the real creation of Babbitt and the group around *Perspectives of New Music*. Yale under Allen Forte became another such centre" (*Contemplating Music*, 75; see also 27, 43, 56). See also Fred Maus, "Recent Ideas and Activities of James K. Randall and Benjamin Boretz: A New Social Role for Music," *Perspectives of New Music*, 26/2 (Summer, 1988): 214–15.

⁴¹² Babbitt, "Past and Present Concepts"; Jason Gibbs, "Review of *Words about Music* by Milton Babbitt," 16, 19–20.

⁴¹³ David Hilbert, "On the Foundations of Logic and Arithmetic." in *From Frege to Gödel: A Source Book in Mathematical Logic, 1879-1931,* ed. J. van Heijenoort, trans. S. Bauer-Mengelberg (Cambridge: Harvard University Press, 1967), 300–66; idem., *Foundations of Geometry.* See also Mathieu Marion's account of Hilbert's meta-mathematical formalism in *Dictionnaire d'histoire e: philosophie des sciences* (Paris: Presses Universitaires de France, 1999), s.v. "Formalisme"; John D. Barrow, *Pi in the Sky – Counting, Thinking, and Being* (New York: Penguin, 1993), 106–40, 178–245.

⁴¹⁴ Milton Babbitt, "Who Cares If You Listen," in *High Fidelity's Silver Anniversary Treasury* (Great Barrington, Mass.: Wyeth Press, 1976): 83; first published in *High Fidelity* (February, 1959).

⁴¹⁵ Stephen Soderberg, "Riemannian Variations on a Theme by Babbitt," *Perspectives of New Music*, 35/2 (1997): 7–15. In response to Soderberg's article, Babbitt writes: "I am particularly grateful to Stephen Soderberg for the unexpected introduction of the name of the 'good' Riemann; not that the other Riemann was all bad as he ranged from the preposterous (haveth upbeats everywhere) to the fraudulent (Ugoline de Maltero!) to the analytically influentiál" ("A Response: Milton Babbitt," *Perspectives of New Music* 35/2 [1997]: 132).

related formulation)⁴¹⁶—of "possible worlds," "possible geometries," and "possible musics"—is a very conscious one for Babbitt:

[Babbitt] created musical worlds which, to borrow a phrase from John Fowles, were 'always a complexity beyond daily reality.' He also wrote about these worlds – and the implied existence of others – in words which were always a refreshing complexity beyond daily reality.⁴¹⁷

Just as Vienna Circle conventionalism is premised on Wittgenstein's view that language and logic are founded upon tautologies that point to nothing in the empirical world beyond themselves, twelve-tone theory, for Babbitt, seemed to suggest that music could be based upon mathematical formalisms for which no empirical correlates need be offered. Cone and Boretz explicitly link Schoenberg and Babbitt to the Vienna Circle in this respect:

In Schoenberg's theoretical quest, one can discern the spirit of what might be termed the *Bauhaus* mentality, which in turn was reflected, however hazily, in the [conceptualizations of] the Vienna Circle . . . and the writings of Schlick, Neurath, Carnap, and Wittgenstein. . . . [This] tempts speculation regarding the amount of conceptual anguish Schoenberg might have been spared had he shared the epistemological and methodological discoveries of his Viennese coresidents. But, in fact, the explicit relation of the study of musical structure to the whole spectrum of contemporary intellectual development was an insight of a later generation of composers. Milton Babbitt, in particular, was the first to suggest that the force of any 'musical system' was not as universal constraints for all music but as alternative theoretical constructs. . . . Under such an interpretation, the invention of musical systems is itself seen to be part of the creative resource of composition, rather than its invariant context. . . . An even more radical relativism, in which standards of musical cognitivity are still further detached from universals, is suggested in the writings of some young composers (Randall, Boretz, et al.).⁴¹⁸

⁴¹⁶ Nelson Goodman, Ways of Worldmaking; John Covach, "Schoenberg's Turn to an 'Other' Wcrld."

⁴¹⁷ Soderberg, "Riemannian Variations on a Theme by Milton Babbitt," 10.

⁴¹⁸ Boretz and Cone, Preface to Perspectives on Contemporary Music Theory, viii-ix.

WAS SCHOENBERG A RADICAL FORMALIST?

I have argued that Schoenberg was reluctant to recommend such an elevation of the notion of structural autonomy. It is nonetheless easy to understand how his thought might be interpreted as the historical beacon pointing toward it. Indeed his insistence upon value-relativity, his affirmation of the composer's obligation to create (rather than presuppose) a musical language, and aspects of the twelve-tone method itself (particularly the multi-directional conception of pitch-space) all seem to support that interpretation. Portrayals of Schoenberg as a radical formalist are commonplace in present-day musicological discourse. Leon Botstein writes of "the widespread contemporary and posthumous perception that Schoenberg was the creator of a unique radical modernism."⁴¹⁹ Views of Schoenberg expressed by Rose Subotnik and Joseph Swain are typical in this respect:

Schoenberg revealed in his writings the hope of weaning listeners away from sensuous preoccupations. . . . All of us who study music are caught in the Western dialectic. [When we] insulate abstract modes of thinking from the contingencies of concrete experience, we have to measure the risk, well symbolized by Schoenberg's paradoxical career, of coarsening through overrefinement our sensitivity to other responsibilities of knowledge.⁴²⁰

Serious composition in our century [became] one more exercise of the intellect. Composition supersedes the mere fashioning of sounds and becomes the fashioning of ideas. . . . Arnold Schoenberg became famous for founding a system of composition whose terms seemed completely rational and explicit, and

⁴¹⁹ Botstein, "Schoenberg and the Audience," 27.

⁴²⁰ Subotnik, "Toward a Deconstruction of Structural Listening," 111-12, 122.

this intellectual audacity set the pattern for the next half-dozen decades of the century.⁴²¹

I have argued that characterizations such as these are misrepresentations of Schoenberg's position. They confuse aesthetic relativism (anti-foundationalism with respect to "beauty" and "value") with radical idealism and radical formalism (anti-foundationalism with respect to material empirical reality), and consequently ally Schoenberg's thought over-intimately with later set-theory scholarship, particularly its radical-formalist branch. Schoenberg might indeed have found post-war mathematical modeling congenial insofar as it treats musical languages as autonomous rule-governed systems that are *about* some aspect of their own structure. But I would argue that many set-theorists have "out-Schoenberged" Schoenberg by applying set-theory without regard for empirical concerns. Malipiero stated the case more bluntly: "Schoenberg's followers have overdone it!"⁴²²

Regrettably, Schoenberg did not address himself explicitly to questions pertaining to mathematical modeling in music theory. I have arrived at my thesis by means of a certain amount of interpretation and extrapolation based on what we know of his general epistemological stance, just as set-theorists have had to arrive at their own conclusions concerning the mathematical extensions

⁴²¹ Swain, *Musical Languages*, 119–22. For corroborating views, see Dahlhaus, *Analysis and Value Judgment*, 17; Subotnik, "Toward a Deconstruction of Structural Listening," 89.

⁴²² Cited in Botstein "Schoenberg and the Audience," 19.

and implications of his theory. Wittgenstein, however, was fully explicit in expressing his views concerning the application of mathematical modeling to the empirical domain. Let us now turn to an examination of this aspect of Wittgenstein's thought, considering how it might shed light on the formalistic approach to music theory that has been espoused by post-war set theorists.

WITTGENSTEIN'S GRUNDGEDANKE: THE AUTONOMY OF LOGIC AND MATHEMATICS

The Autonomy of Logical Propositions. Wittgenstein's "flash of insight which illuminates a tangle of philosophical problems,"⁴²³ is the notion that logic does not say anything about the world, that the tautological symbols of logic have a kind of self-referential property.⁴²⁴ The logical symbolism is "about" some aspect of its own structure. It "must take care of itself."⁴²⁵ If we think we can investigate logic "by looking at the world . . . we are on a fundamentally wrong track."⁴²⁶ Wittgenstein calls this his "fundamental idea" (*Grundgedanke*),⁴²⁷ the very core and essential argument of the *Tractatus*.⁴²⁸ According to this view, the

⁴²⁵ *Tractatus Logico-Philosophicus*, proposition 5.473.

⁴²⁶ Ibid., proposition 5.551.

⁴²⁷ Ibid., proposition 4.0312: "My fundamental thought is that the 'logical constants' are not representatives; that there can be no representatives of the *logic* of facts."

⁴²⁸ McDonough, The Argument of the Tractatus.

⁴²³ Max Black, A Companion to Wittgenstein's Tractatus (Ithaca: Cornell University Press, 1970), 173.

⁴²⁴ *Tractatus Logico-Philosophicus*, propositions 6.113 and 6.127. See also B. Dreben and J. Floyd, "Tautology: How Not to Use a Word," *Synthèse*, 87/1 (1991): 23–50.

elaborations of logic that underlie propositional language can be understood as a kind of "fleshing-out" of analytic consequences that are implicit in (and reducible to) the basic axioms of logic itself. Mounce summarizes this aspect of Wittgenstein's account of tautological propositions:

In one sense, one never gets further than the axioms, for all that one is doing in developing the system is bringing out what is contained in them. The hierarchical system of logic must therefore be wrong. All the propositions of logic are on the same level and all say the same thing, namely, nothing. In other words, in developing a logical system one is not deducing more and more truths about reality, one is elaborating the internal connections between propositions.⁴²⁹

In order to clarify Wittgenstein's conception of tautology, let us consider the following three rudimentary propositions:

1. "It is raining"

2. "Either it is raining or it is not raining"

3. "'It is raining' is a proposition"

For Wittgenstein, only the first proposition actually "says something," whereas

the second and third propositions say nothing at all. Since "It is raining" is

logically *bipolar* (i.e., it is possible for it to be either true or false), it is an example

of a real ("synthetic") proposition about the world.⁴³⁰ The factual truth or

⁴²⁹ Mounce, *Wittgenstein's Tractatus: An Introduction*, 46. Since Wittgenstein places all of the propositions of logic "on the same level," Mathieu Marion suggests that it may not be appropriate to speak of axioms at all (as Mounce does here) since they are hierarchically distinguished from rules of inference ("Qu'est-ce que l'inférence? Une Relecture du *Tractatus Logico-Philosophicus," Archives de philosophie*, 2001, in press).

⁴³⁰ It must be noted that Wittgenstein never uses the term "synthetic proposition." He employs the term "analytical propositions," however, in proposition 6.1 of the *Tractatus*: "The propositions of logic therefore say nothing. (They are the analytical propositions)."

falsehood of this proposition has no bearing, however, on its legitimacy.

Wittgenstein describes how we are able to create a mental picture of two possible "states of affair" (*Sachverhalten*) in the world, one wherein this proposition is true (if it is raining) and one wherein it is false (if it is not raining).⁴³¹ Once we understand what is meant by "to be raining," the proposition is recognized as one that admits the possibility of either truth or falsehood. It is therefore a legitimate and real proposition. Legitimate propositions (as opposed to nonsensical ones) are characterized by Wittgenstein as pictureable state of affa.rs that can be shown to be either true or false.⁴³²

The second and third of these propositions, on the other hand, are examples of what Wittgenstein describes as "pseudo-propositions" or "formal concepts" (as opposed to real or "proper" concepts).⁴³³ They are logically *unipolar* in the sense that they are characterized by the impossibility of being

⁴³² This insistence on the bipolarity of real concepts lead Wittgenstein eventually to deny that one can claim to "know" that one is in pain, for example. According to this view, if one cannot speak of doubt, one cannot speak of knowledge. Thus to say 'I know that I am in pain' is to misuse language, since it is impossible to doubt it. See Ludwig Wittgenstein, "Note for Lectures on 'Private Experience,' and 'Sense Data' (ed. Rush Rhees)," *Philosophical Review*, 78/3 (1968), 275-300.

⁴³³ *Tractatus Logico-Philosophicus*, proposition 4.126: "We can now talk about formal concepts, in the same sense that we speak of formal properties. (I introduce this expression in order to exhibit the source of the confusion between formal concepts and concepts proper, which pervades the whole of traditional logic.)" See also Mounce, *Wittgenstein's Tractatus*, 59.

⁴³¹ Erik Stenius describes how Wittgenstein employs the term *Sachverhalt* ("state of affairs") so as to designate a "possible fact," while he employs *Tatsache* ("fact") to designate an actual one (*Wittgenstein's Tractatus: A Critical Exposition of its Main Lines of Thought* [Connecticut: Greenwood Press, 1981]). See also the Appendix ("The translations of *Tatsache, Sachverhalt, Satz,* and *Elementarsatz*") of Donald M. Peterson, *Wittgenstein's Early Philosophy: Three Sides of the Mirror* (Toronto: University of Toronto Press, 1990), 183–93.

false.⁴³⁴ They are logical and definitional propositions whose subject-matter is the propositional-logic itself, rather than the world.⁴³⁵ Tautologies consist of molecular propositions that are so combined that bipolarity, and hence all content, cancels out.⁴³⁶ They all say the same thing, namely nothing. Thus to know a tautology is to know nothing. When Wittgenstein and the Vienna Circle positivists affirm the verifiability criterion of meaning—"the meaning of a proposition is its method of verification" (that is, the meaning of a proposition is given by specifying its truth-conditions)—they are essentially referring to a tripartite conceptual schema wherein a clear distinction is drawn between the bipolar, unipolar, and nonsensical propositions of language (Figure 2).⁴³⁷ The word "logical" in *logical* positivism was intended to capture this conception of the distinctly analytic nature of logical and mathematical truth.

⁴³⁶ *Tractatus Logico-Philosophicus*, proposition 4.466: "Tautology [is] . . . the disintegration of the combination of signs."

⁴³⁷ Moritz Schlick, "Meaning and Verification," *Philosophical Review*, 45 (1936): 339–69. The corollary to this statement of the verification criterion of meaning is that any proposition lacking a method of verification is meaningless. See also Carl G. Hempel, "The Empiricist Criterion of Meaning," in *Logical Positivism*, ed. A. J. Ayer (New York: The Free Press, 1959), 108–29.

⁴³⁴ Ibid., proposition 6.113: "It is the peculiar mark of logical propositions that one can recognize that they are true from the symbol alone, and this fact contains in itself the whole philosophy of logic."

⁴³⁵ Our second proposition comes from an example used by Wittgenstein: "'It is raining or it is not raining' tells us nothing about the weather" (Wittgenstein, *Remarks on the Foundations of Mathematics*, 231).

Representational Language (logically <i>bipolar:</i> admitting the possibility of either truth or falsehood)	Non-Representational Language (logically <i>unipolar</i> : tautologies, characterized by the impossibility of being false)	Nonsensical Language (logically <i>apolar</i>)
the world of	the <i>syntactic</i>	the mystical, ethical,
facts and states-of-affairs	(pseudo-propositions,	theological, aesthetic,
(real or "proper" concepts,	<i>analytic</i> propositions,	philosophical,
<i>synthetic</i> propositions)	<i>formal</i> concepts)	metaphysical

Figure 2

The Autonomy of Mathematical Propositions. Following the publication of the *Tractatus,* Wittgenstein maintained correspondence with Russell, Moore, and members of the Vienna Circle. Otherwise, the 1920's were largely a period of self-examination and hiatus for Wittgenstein.⁴³⁸ In 1928, however, he attended a lecture in Vienna on the foundations of mathematics given by the Dutch mathematician L. E. J. Brouwer.⁴³⁹ According to his companion that evening,

⁴³⁸ Wittgenstein's activities during this period have contributed to his reputation as one of the great eccentrics of intellectual history. He traveled, worked as a gardener and an elementary-school teacher in rural Austria, and designed and constructed a home in Vienna for his sister, Margarethe Stonborough (in collaboration with Paul Engelmann, who had studied architecture with Adolf Loos). Wittgenstein's sister Hermine described the house as "logic become house" ("*hausgewordene Logik*"). See Bernhard Leitner, *The Architecture of Ludwig Wittgenstein* (New York, 1976), 32. See also Monk, *Ludwig Wittgenstein*, 169-234.

⁴³⁹ Luitzan Egbert Jan Brouwer, "Mathematik, Wissenschaft und Sprache." Reprinted in L. E. J. Brouwer, Collected Works, Vol. 1, ed. A. Heyting (Amsterdam: North Holland, 1975).

Brouwer's lecture provoked his return to philosophy.⁴⁴⁰ Over the next twenty years Wittgenstein devoted nearly half of his writings to mathematical topics: the foundations of mathematics, the nature of numbers, their cognitive origins, and their application to reality.⁴⁴¹

When, in chapter 2, I defined mathematical statements as analytic propositions, I was already adopting Wittgenstein's fundamental position concerning the foundations of mathematics. For Wittgenstein, the elaborations of mathematics, like the elaborations of logic that underlie language, can be understood as merely the fleshing-out of features of the system that are already implicit in its basic axioms. "Mathematics is a logical method," Wittgenstein states clearly in the *Tractatus.* "The propositions of mathematics are equations, and therefore pseudo-propositions. A proposition of mathematics does not

⁴⁴⁰ This story is recounted both by Monk (*Ludwig Wittgenstein*, 249) and Crispin Wright (*Wittgenstein on the Foundations of Mathematics* [Cambridge: Harvard University Press, 1980], vii). Wittgenstein's companion was Vienna Circle member Herbert Feigl. Both Monk and Wright note that Wittgenstein may have been stimulated more by his opposition to some aspects of Brouwer's "intuitionist" approach to mathematical epistemology as by any sympathy for it. Gargani, Marion, and Garavaso have suggested a somewhat closer affinity between Wittgenstein's constructivist viewpoint and Brouwer's intuitionism. Aldo Gargani, "Techniques descriptives et procedures constructives," 80-81; Mathieu Marion, "On the Philosophical Relation Between Brouwer and Wittgenstein," Paper presented to the Boston Colloquium for Philosophy of Science, November 2000; idem., *Wittgenstein, Finitism and the Foundations of Mathematics* (Oxford: Clarendon Press, 1998); Pieranna Garavaso, "Objectivity and Consistency in Mathematics: A Critical Analysis of Two Objections to Wittgenstein's Pragmatic Conventionalism." (Ph.D. Dissertation, University of Nebraska, 1989).

⁴⁴¹ Crispin Wright, "Wittgenstein on Mathematical Proof," in *Wittgenstein Centenary Essays*, ed. A. Phillips Griffiths (Cambridge: Cambridge University Press, 1991), 79. See also Crispin Wright, *Wittgenstein on the Foundations of Mathematics*; Stuart G. Shanker, *Wittgenstein and the Turning-Point in the Philosophy of Mathematics* (Albany: State University of New York Press, 1987); Marion, *Wittgenstein, Finitism and the Foundations of Mathematics*.

express a thought."⁴⁴² Engelmann summarizes this aspect of Wittgenstein's position:

Mathematics, according to Wittgenstein, is a method of logic, and – like all logical propositions – its expressions are tautologies. Logic enables meaningful propositions to be stated, but there are no meaningful propositions of logic itself. Mathematics constitutes a method that does not teach us anything new about the content of propositions. What it does teach us is to manipulate expressions by substitution in such a way as to throw their structure into relief and to cast it in the desired form, which was latent in the original meaningful proposition.⁴⁴³

According to this view, the pseudo-propositions of both logic and mathematics are "analytic" propositions. It is important to note, however, that despite Engelmann's liberal employment of the word, Wittgenstein never actually refers to the pseudo-propositions of mathematics as "tautologies." Rather Wittgenstein seems to make a subtle distinction between the pseudo-propositions of logic (which are reducible to tautologies) and the pseudo-propositions of mathematics (which are reducible to equations).⁴⁴⁴ He says that what an equation "means" is simply that its terms can be substituted for one another, and he emphasizes that

⁴⁴² Tractatus Logico-Philosophicus, propositions 6.2–6.21.

⁴⁴³ Engelmann, Letters, 105–6.

⁴⁴⁴ See the section headed "Equations and Tautology" in Friedrich Waismann, *Wittgenstein and the Vienna Circle [Wittgenstein und der Wiener Kreis,* 1925-36], ed. B. F. McGuiness, trans. J. Schulte and B. F. McGuiness (Oxford: Blackwell, 1979), 105–7. In the *Tractatus* (propositions 4.126, 4.1273, 4.466, 6.022, 6.03, and 6.2) Wittgenstein builds a case against Russell's confusion of the notions of equation and tautology. Ramsey attempted to use the *Tractatus* account of propositional logic to show that mathematics consists of tautologies (in Wittgenstein's sense), and thus that the propositions of mathematics are simply logical propositions. Wittgenstein's reluctance to full equate the tautologies of logic with the equations and elaborations of mathematics became a source of cor flict with Ramsey (Monk, *Ludwig Wittgenstein,* 245). See Ramsey, *The Foundations of Mathematics*. See also the chapter titled "From Truth-Functional Logic to a Logic of Equations" in Marion, *Wittgenstein, Finitism and the Foundations of Mathematics,* 110–46.

mathematics, taken independently from its applications, is concerned only with

the manipulation of symbols rather than with facts:

The possibility of proving the sentences of mathematics means simply that their correctness can be recognized without having to compare what they express with facts in order to determine their correctness.⁴⁴⁵

David Peterson summarizes Wittgenstein's view of the equations of mathematics:

The subject matter of mathematics is syntactic rather than factual: the relation of inter-substitutability, or synonymy, of two expression in mathematics is grounded in the expressions themselves — so long as the meanings of the constituent terms are given — and does not depend on anything external. Equations are therefore non-representational: the point of saying that they are 'pseudo-sentences' is not that they are vacuous or erroneous, but that, although they may seem to be fact-stating, they are not.⁴⁴⁶

Carl Hempel, a peripheral member of the Vienna Circle and a leading

logical positivist of the next generation, reiterates this position concerning the

status of mathematical propositions:

A mathematical truth is irrefutably certain just because it is devoid of factual, or empirical content. Any theorem of geometry, therefore . . . is analytic in the technical sense of logic, and thus true *a priori*; i.e., its truth can be established by means of the formal machinery of logic alone, without any reference to empirical data.⁴⁴⁷

Let us consider the machinery of music-theoretical mathematical modeling

from this perspective. Mathematical modeling purports to describe musical logic

by subjecting intervalic structures of a given piece to the axioms of modulo-12

⁴⁴⁵ Tractatus Logico-Philosophicus, proposition 6.2321.

⁴⁴⁶ Peterson, Wittgenstein's Early Philosophy, 130.

⁴⁴⁷ Hempel, "Geometry and Empirical Science," 119.

mathematics and set theory. Applying Wittgenstein's argument, we begin to see that the elaborate results obtained thereby may only be traceable back to the fundamental axioms of set theory itself, rather than to the piece or body of music in question. Consider how, when we state that both 7 and 11 belong to the set of all prime numbers (i.e., by virtue of sharing the property of having only one and themselves as factors), we are fleshing-out an aspect of the system of wholenumber mathematics, rather than stating a fact about the world of experience. There is nothing in the empirical experience of "seven-ness" and "eleven-ness" that would otherwise cause us to associate them. Similarly, when Forte and Lewin posit the Z-relation between two chords they are pointing out an analytic property of modulo-12 mathematics, rather than an empirical proposition about music.448 The possibility of extraordinary feats of ear-training notwithstanding,449 we can confidently assert that the Z-relatedness of two chords cannot be observed directly.

Let us now consider some rudimentary music-theoretical propositions:

⁴⁴⁹ See fn. 397, above.

⁴⁴⁸ In Forte's system, Z-related sets are those sets of the same cardinality which have identical interval-vectors, but which are not reducible to the same prime-form (Allen Forte, *The Structure of Atonal Music*, 21, 79). See also David Lewin, "The Intervallic Content of a Collection of Notes," *Journal of Music Theory*, 3/2 (1960): 298–301.

1. C⁴-E⁴-G⁴ is a consonant triad⁴⁵⁰

C⁴-E⁴-G⁴ and C#⁴-D⁴-Eb⁴-F⁴-F#⁴-Ab⁴-A⁴-Bb⁴-B⁴ are complementary sets⁴⁵¹
 C⁴-E⁴-G⁴ is a member of the set-class 3-11 [0,3,7]⁴⁵²

Again adopting Wittgenstein's viewpoint, we recognize that the first of these three propositions purports to "say something about the world," whereas the second and third do not. Once we understand what is meant by "to be consonant," the first proposition is recognized as a legitimate and real one, since we can conceive of both "states of affairs," one wherein it is true, and another wherein it is false.⁴⁵³ By contrast, the second and third propositions are formal propositions that say nothing about the world or experience. They are "analytic" and "definitional" propositions rather than "observational" propositions.

As music-theoretical propositions, the examples given above are rudimentary in the extreme. One can nonetheless appreciate how, according to Wittgenstein's framework, the first proposition acquires an epistemological

⁴⁵⁰ The rudimentary notion of triadic consonance is one of the most ubiquitous and primary foundational postulates in the history of music theory. Hauptmann, for example, asserts simply that "the triad is consonant for the uneducated as well as for the educated" (Hauptmann, *The Nature of Harmony and Metre*, xl).

⁴⁵¹ Many other rudimentary set-theoretical propositions (e.g., "C⁴, E⁴, G⁴ and Ab³, F³, C⁴ are inversionally-equivalent triads") could have been substituted here.

⁴⁵² Forte derives his table of "Prime Forms of Pitch-Class Sets" (Appendix I) by performing a routine mathematical procedure which reduces all pitch-class sets to a "best normal order," whereupon they are classified (*The Structure of Atonal Music*, 179).

⁴⁵³ The definition of "consonance" is admittedly neither unproblematic nor universal, but then neither is the concept "to be raining." In both cases, our understanding of the proposition presupposes agreement concerning the definition of the elementary concepts involved.

status and word-to-world correspondence that the latter two lack. An appreciation for this insight becomes increasingly important when evaluating situations where analytic propositions (propositions #2 and #3, above, for example) are offered as *foundations* for other, more complex, analytic propositions. Let us now examine the problem of perceptual falsifiability in music theory more closely.

MUSIC-THEORETICAL FORMALISM AND THE PROBLEM OF TAUTOLOGY

Ernst Krenek acknowledged that Schoenberg's atonal music had expanded chromaticism to its limit. Adopting Schoenberg's (and Wagner's) historicist imperative concerning of the evolution of musical style,⁴⁵⁴ Krenek suggested that only a single apparent path lay ahead for the development of twelve-tone technique. "As the musical language cannot be further expanded," he affirmed, "it can be changed only by restriction."⁴⁵⁵ For some theorists, a wholly formalistic account of musical language is the inevitable concomitant of this development. Michel Philippot, for example, proposes the following general principle (which he calls 'Philippot's theorem') to account for the history and variety of musical languages:

One thing appears obvious in the history of music. The quantity of constraints (rules) remains constant, while at the same time the nature of these constraints (rules) changes according to periods and musical styles... Therefore, the truth of the following postulate is demonstrated: the coherence of a given musical

⁴⁵⁴ "New Music, Outmoded Music, Style and Idea [1946]," in *Style and Idea*, 113–23.

⁴⁵⁵ Krenek, "Schoenberg the Centenarian," 90.

system of any kind is proportional to the quantity of its constraints, but independent of their natures.⁴⁵⁶

We might think of this as a "general systems theory" or "game theory" approach to musical language, one that is concerned primarily with *quantities* of constraints, without a concomitant concern for the kind or quality of constraints involved.⁴⁵⁷ Joseph Swain has challenged this view, arguing that to call something a "language," in any meaningful sense, is to suggest that it is more than merely a system of "coherences."⁴⁵⁸ Schoenberg likewise would have rejected Philippot's suggestion that the "rules of the game" of composition might be wholly arbitrary. He "abhorred the very notion of music reduced to a sonorous game."⁴⁵⁹

The Problem of Perceptible Relevance and Falsifiability. Schoenberg conceived of music as a form of "logic" that is subject to constraints imposed not only by the

⁴⁵⁷ Christopher Weise writes: "The definition I prefer for a musical-compositional system leans in the direction of General Systems Theory" ("Is a Serial Revival Possible," *New Modern Music: A Review of Contemporary Music and Culture,* 2 [Fall, 1999]: 7). See also R. J. Aumann, and S. Hart, eds., *Handbook of Game Theory* (Amsterdam: North-Holland, 1994); Lennart Åqvist, "Music from a Set-Theoretical Point of View," *Interface,* 2 (1973): 1-22; Michael Kassler, "A Sketch of the Use of Formalized Languages for the Assertion of Music," *Perspectives of New Music,* 1/2 (Spring, 1965): 83–94; Susanne K. Langer, "A Set of Postulates for the Logical Structure of Music," *The Monist,* 39 (1929): 561-70; Herman van San, "Sundry Notes Introductory to the Theoretical Mechanics of Mathematical Music," *Interface,* 2 (1973): 23-50.

⁴⁵⁸ Swain, Musical Languages.

⁴⁵⁹ Ringer, "Schoenberg and the Prophetic Image in Music," 27.

⁴⁵⁶ Michel Philippot, "Ear, Heart and Brain," *Perspectives of New Music*, 15 (1976): 45–60. Philippot's title alludes to Schoenberg's essay "Heart and Brain in Music [1946]" in *Style and Idea*, 53–75.

composer, but also by two distinctly Kantian determinants:⁴⁶⁰ the laws of sound (Schoenberg calls them "the requirements of the material"),⁴⁶¹ and the laws of cognition (Schoenberg calls them "the demands of the subject").⁴⁶² Notwithstanding his apparent belief "that there is more behind number in music than is generally acknowledged,"⁴⁶³ Schoenberg also remarked that "mathematics and mechanics cannot produce a living being [composition]."⁴⁶⁴

One of Schoenberg's students recalls a telling remark he made to a composition class concerning the question of concept-percept correspondence and compositional technique. The anecdote suggests that Schoenberg felt the structural elements of music needed to be perceptible to the listener, at least or some level:

'Where is a period,' he asked compliantly. I pointed it out on the score. 'Ah yes,' he said, 'but you cannot tiptoe out among the audience while the piece is playing and say: here is a period.' This comment amused the class and made his point that the structure of a composition must be heard as well as seen.⁴⁶⁵

⁴⁶⁰ Carpenter and Neff have suggested that Schoenberg may have inherited this perspective from Oskar Adler, Schoenberg's first theory teacher and a committed Kantian. Schoenberg's "demands of the object" correspond roughly to those of Kant's "noumena," while the "demands of the subject" correspond roughly to those of Kant's "phenomena" (Commentary on *The Musical Idea*, 10–11).

461 Theory of Harmony, 7.

⁴⁶² "Composition with Twelve Tones I [1941]," *Style and Idea*, 220. For corroborating viewpoints see also Fred Lerdahl, "Cognitive Constraints on Compositional Systems," in *Generative Processes in Music: The Psychology of Performance, Improvisation, and Composition*, ed. John A. Sloboda (Oxford: Clarendon Press, 1988), 231–59 (reprinted *in Contemporary Music Review*, 6/2 [1992]: 97–122); Meyer, "A Universe of Universals."

⁴⁶³ Knight, "Classes with Schoenberg," 160.

⁴⁶⁴ "Franz Liszt's Work and Being," in *Style and Idea*, 444.

⁴⁶⁵ Knight, "Classes with Schoenberg," 140.

Rather than focusing on *saying* how their music is organized, Schoenberg clearly wanted his students to place emphasis on *showing* the organization in the audible music itself. His position on the question of perceptibility was nonetheless more nuanced than this charming anecdote suggests. A better account of Schoenberg's view can be gleaned from his descriptions of the way in which harmonic and motivic devices may lie beneath the immediately perceptible musical surface:

Whether or not the ear recognizes the device, it feels instinctively the connection. . . . The composer knows the devices, the connections, but the audience must not see them, must only feel that the piece is good.⁴⁶⁶

The limits of comprehensibility are not the limits of coherence, which can be present even when comprehensibility has ceased. For there are connections inaccessible to consciousness. Such connections possibly have an effect on mcre experienced and trained listeners.⁴⁶⁷

In short, Schoenberg requires that compositional devices be audibly significant, but he concedes that perhaps only their *effects* will be heard by the listener (and perhaps then only by the *trained* listener), leaving the composer alone to be aware of the compositional devices that give rise to these effects. Joseph Dubiel states a similar conception of the concept-percept relationship underlying twelve-tone theory. "I like the idea of hearing the *influence* of the series," Dubiel writes, "better than the idea of hearing the series."⁴⁶⁸ This is not radical formalism. For

⁴⁶⁶ Ibid., 158. Knight is citing Schoenberg's commentary to his 1934 composition classes in Boston and New York.

⁴⁶⁷ Schoenberg, Coherence, Counterpoint, Instrumentation, Instruction in Form, 9.

⁴⁶⁸ Joseph Dubiel, "What's the Use of the Twelve-Tone System," *Perspectives of New Music*, 35/2 (1997): 44.

Schoenberg – as for present-day empiricist-oriented music theorists – musical objects, whether defined by set theory or other systems of description, must also be auditory-objects on some level.⁴⁶⁹

The Fallacy of Theorism: Tossing Blankets over Invisible Men. Most of the axioms and assumptions of present-day music-theoretical mathematical modeling have reached farther into the realm of abstraction than anything Schoenberg claimed. As objects of knowledge and perception, the status of many set-theoretical postulates remains undetermined.⁴⁷⁰ Abstract inclusion-relations (set complexes, super sets, nexus sets, Z-related sets, K- and Kh-related sets, for example) and equivalence-relations (inversional equivalence, for example),⁴⁷¹ exclusion-relations,⁴⁷² similarity-relations,⁴⁷³ and complex set transformations

⁴⁷¹ John Clough, "PC Set Equivalence and Inclusion: A Comment on Forte's Theory of Set Complexes," *Journal of Music Theory*, 9 (1965): 163–71; David Lewin, "Inversional Balance as an Organizing Force in Schoenberg's Music and Thought," *Perspectives of New Music*, 7/1 (1968): 1-21.

⁴⁶⁹ Fred Lerdahl's stance that many structures underlying serial music are inaccessible to all or most listeners is well-known ("Atonal Prolongational Structure," *Contemporary Music Review*, 4 [1989]: 65–87). He has recently relaxed his argument somewhat, noting that a listening strategy appropriate for serial music is simply "much harder to learn than its tonal counterpart" ("Cognitive Constraints on Compositional Systems," 251). Catherine Nolan notes that twelve-tone analytical methodology must "invite and focus a deliberation about [its] empirical and epistemological foundations" (Abstract of "Serial and Metaserial Elements in a Twelve-Tone Work: Local and Long-Range Coherence in Webern's Op. 24/II," Paper presented at the Annual Meeting of the Society for Music Theory, Baton Rouge, Louisianna, November, 1996). See also Meyer's chapter titled "*The Perception and Cognition of Complex Music*," in *Music, the Arts, and Ideas*, 266-93.

⁴⁷⁰ See George Perle, "Pitch-Class Set Analysis: An Evaluation," *Journal of Musicology*, 8/2 (Spring, 1990): 151-72. An excellent summary review of the principles and history of set theory is presented in Bryan Simms' "The Theory of Pitch-Class Sets."

⁴⁷² John Clough, "Profiling of PC Sets by means of the Exclusion Relations," *Journal of Music Theory*, 27 (1983): 181–201.

(Riemannian operations, Klumpenhouwer networks, for example)⁴⁷⁴ have proven resistant to empirical study.⁴⁷⁵ Given the range and potential of human perception, and the possibility of invoking ill-defined notions such as "coherence" and the testimony of extremely expert listeners,⁴⁷⁶ perhaps it will always be exceedingly difficult to pose cogent, relevant, and methodologically sound questions in the perception laboratory concerning the audibility and effects of many of the devices posited by set-theory.

Fortunately the task here is not to attempt to solve these problems, but rather to look to Schoenberg and Wittgenstein for some general insights into the nature of the epistemological issues at stake. Let us approach this question by

⁴⁷³ Forte expresses some doubt about his own criteria for measuring pitch-class set "similarity," which involves the comparison of non-equivalent sets of equal cardinality with respect to interval content (*Structure of Atonal Music*, 47–53).

⁴⁷⁴ David Lewin, *Generalized Musical Intervals and Transformations* (New Haven: Yale, 1987); idem.,
"A Tutorial on Klumpenhouwer Networks, Using the Chorale in Schoenberg's Op. 11, No. 2," *Journal of Music Theory*, 38/1 (1994): 79–101; Shaugn O'Donnell, "Klumpenhouwer Networks,
Isography, and the Molecular Metaphor," *Intégral*, 12 (1999): 53-80; John Clough, "Review of
Lewin's 'Generalized Musical Intervals and Transformations," *Music Theory Spectrum*, 11 (1989):
226–31; Richard Cohn, "Neo-Riemannian Operations, Parsimonious Trichords, and their *Tonnetz*Representations," *Journal of Music Theory*, 41 (1997), 1-66.

⁴⁷⁵ Eric Regener expresses skepticism concerning the notion of the "set-complex": "The relation of the set-complex to musical reality seems somewhat debatable" ("On Allen Forte's Theory of Chords," *Perspectives of New Music*, 13 [1974]: 209). For discussions of other unresolved empirical research questions concerning set-theoretical postulates, see Carol Krumhansl, "Music Psychology and Music Theory: Problems and Prospects," *Music Theory Spectrum*, 17/1 (1995): 53-90; Friedmann, *Ear-Training for Twentieth-Century Music*; Covington and Lord, "Epistemology and Procedure in Aural Training."

⁴⁷⁶ Nicholas Cook differentiates expert listening or "musicological perception," from a more ordinary mode of perception which is undirected by the *a priori* concepts and "theorisms" of music scholarship ("Perception: A Perspective from Music Theory," in *Musical Perceptions*, ed. R. Aiello and J. Sloboda [Oxford: Oxford University Press, 1994]: 64-94).

considering "the influence of the series" (with respect to harmony) to which Schoenberg and Dubiel refer. Schoenberg's position is remarkably uncomplex the sovereignty of the series provides for normative "coherence" while at the same time liberating the composer and listener from the normative gestures ar d strictures of tonality.⁴⁷⁷ Few theorists would contest these relatively straightforward and modest claims. Hardly more controversial is Babbitt's assertion that when composers conceive of set-theoretical procedures at the pre-compositional stage, "as a compositional prescriptive" for harmonic and motivic structure, corresponding audible "coherences" are likely to be discernible in their music.⁴⁷⁸

It is another kind of theorizing that gives rise to misunderstandings according to Wittgenstein and Schoenberg. When theories of science build elaborate and metaphorical descriptions of the world, or when mathematicalmodeling techniques are applied to music as a *post*-compositional analytic tool. they run the inherent risk of "theorism," of mistaking features of the tool for those of the object under analysis.⁴⁷⁹ This is the conclusion Wittgenstein wanted

⁴⁷⁷ "My Evolution [1949]," in Style and Idea, 87.

162

⁴⁷⁸ Babbitt "Past and Present Concepts," 6.

⁴⁷⁹ Popper refers to the human proclivity for "theory-impregnated experience" (*Myth of the Framework*, 53). I am employing the term "theorism" to refer more specifically to any theorydriven approach that tends to confuse features of the analytic tool with those of the object under analysis. Nicholas Cook uses this term in a related way to refer to theory-driven listening ("Perception: A Perspective from Music Theory").

to emphasize in one of the most pivotal statements in the *Tractatus* concerning the conceptual foundations of science:

All such propositions [i.e., the laws and theories of science] . . . are *a priori* insights about the forms in which the propositions of science can be cast. ... Newtonian mechanics, for example, imposes a unified form on the description of the world. Let us imagine a white surface with irregular black spots on it. We then say that whatever kind of picture these make, I can always approximate as closely as I wish to the description of it by covering the surface with a sufficiently fine square mesh, and then saying of every square whether it is black or white. In this way I shall have imposed a unified form on the description of the surface. The form is optional, since I could have achieved the same result by using a net with a triangular or hexagonal mesh. Possibly the use of a triangular mesh would have made the description simpler: that is to say, it might be that we could describe the surface more accurately with a coarse triangular mesh than with a fine square mesh (or conversely), and so on. The different nets correspond to different systems for describing the world. Mechanics determines one form of description of the world by saying that all propositions used in the description of the world must be obtained in a given way from a given set of propositions – the axioms of mechanics. It thus supplies the bricks for building the edifice of science, and it says, "Any building that you want to erect, whatever it may be, must somehow be constructed with these bricks, and with these alone."480

In Wittgenstein's assertion that scientific laws are largely linguistic devices, the Vienna Circle had found an idea laden with intoxicating and profound implications. Karl Popper states Wittgenstein's idea more succinctly: "[The theories of science] may be merely ill-reasoned guesses, bold conjectures, hypotheses. Out of these we create a world, not the real world, but our own nets in which we try to catch the real world."⁴⁸¹ For Wittgenstein and Popper,

⁴⁸⁰ *Tractatus Logico-Philosophicus*, proposition 6.34 and its ancillary proposition 6.341. Wittgenstein develops this idea in propositions 6.32 through 6.372.

⁴⁸¹ Popper, *Unended Quest*, 60. Thomas Kuhn bases his revolutionary notion of the "incommensurability" of scientific theories on this fundamental conceptual framework (*The Structure of Scientific Revolutions*, 2nd ed. [Chicago: University Press, 1970]).

theories are systems of description that are always hypothetical, provisional, fallible, heuristic, and narrowly utilitarian. Above all, we must be on guard against the fallacy of mistaking our theoretical "nets," in themselves, for truth about the world. Newton's system of mechanics, for example, tells us no facts, but it lets us *describe* facts differently.

This view of the conceptual foundations of science bears a striking similarity to Schoenberg's description of theorizing about music as "moving in a circle":

In every case where human understanding tries to abstract from divine works the laws according to which they are constructed, it turns out that we find only laws which characterize our cognition through thinking and our power of imagination. We are moving in a circle.⁴⁸²

In chapters 2 and 3, I discussed Schoenberg's view that harmonic theories are simply "ways of speaking" about harmonic phenomena (his "conventionalism"). Schoenberg is opposed not so much to these conventions *per se*, as to a form of theorism, the glorification of theories themselves, the habit theorists have of ascribing to their theories a kind of universal truth and permanent status. This position is well embodied in a typical Schoenbergian broadside against Schenker's *Ursatz* principle (according to which any composition worthy to be called a "masterwork" must be scaffolded upon structural hierarchies that are

⁴⁸² "Mahler [1912, 1948]," in Style and Idea, 452.

reducible to a fundamental I-V-I harmonic progression), a remark that appears in a note from the planning stage of *The Musical Idea*:

Plan of the book: to avoid all "generalized" philosophical, psychological, and "epistemological" assertions.... Anyone who knows no other chord progression than I-V will misunderstand every other progression.⁴⁸³

An analogy might clarify the relevance of these ideas for the application of set-theory to music analysis. Perhaps we might conceive of a piece of music as an "invisible man." What might we do in the presence of our invisible man if we wish to see and understand him more clearly? One promising strategy might be to toss a blanket over him in the hope of bringing him into view. While the blanket would undoubtedly reveal some aspects of the man's structure and movement, it may not tell us very much about his individual features and character. Indeed it would tend to make all men look alike. We would not know, for example, if we were in the presence of an invisible man or an invisible woman. Thus we could hardly begin to *compare* the various invisible men we encounter on the basis of the features revealed by the "blanket test." Furthermore, if we duly noted four identical right-angle corners among our observations, we would have erroneously attributed a feature of the tool we are using (the blanket itself) to the man. We would have discovered a tautology concerning the structure of blankets (having four right-angle corners is a

⁴⁸³ *The Musical Idea*, 101.

necessary and definitional feature of all square blankets), and nothing at all about the object under analysis.

This is not to suggest that the blanket should be discarded. Perhaps it is one of the most useful tools the human intellect is capable of applying and comprehending in this circumstance. But in order to be able to apply the "blanket test" effectively, it is important to acknowledge the limitations on its utility and to avoid the fallacy of assigning structural features of the blanket (features of modulo-12 mathematics, in our analogy) to the man himself (to the music itself). We must be aware of the limitations of language and mathematics, and of the epistemological dead-end of tautology, if we are to avoid gazing vacantly at our blanket in unending fascination.

The Problem of Over-Generality and Anti-Particularism: The Nominalist Critique. It was noted above that the blanket test tends to make all invisible men look all ke. The application of set theory to the analysis of atonal music has been subjected to a critique based on precisely these grounds. In Lewin's theory of transformational networks, for example, the application of group theory is generalized to such an extent that it is no longer associated with a specific historical period or harmor ic language.⁴⁸⁴ James Davis has argued that Forte's analytic system likewise does an injustice to the individual features of the music under analysis:

⁴⁸⁴ David Lewin, *Generalized Musical Intervals and Transformations* (New Haven: Yale University Press, 1987).

The danger of applying such a system to an art work is not that it will fail to identify a structure; on the contrary, the danger is that, due to its universality, it will always find a structure. Unfortunately, it is likely that structures which are so general are all but meaningless, or trivial at best, in the realm of the particular.⁴⁸⁵

Richard Taruskin has stated a corroborating viewpoint:

As long as no criterion of relevance has been established . . . the endless stream of ostensible relations stemming from the pitch-class survey can persuade us for a while that analysis is being accomplished. But in fact it is only a tabulation that can just as well be carried on in the presence of analysis as in its absence. . . . One never comes back from the fishing expedition empty-handed, there is always "something to say," some "finding" to report. . . . It can deflect attention away from the task at hand, which is to formulate analytical methods, not concoct a universal solvent.⁴⁸⁶

Schoenberg also favoured the particularist approach. For Schoenberg,

each work of art establishes its own aesthetic parameters and must always be

understood on its own terms, in all of its specificity, without undue regard for

extra-opus norms, categories, or generalized theories and systems of any kind.

He warned against all such approaches which divert attention from the particular

in the artwork. Schoenberg's particularism is evident throughout his theoretical

writings:

While science requires systematically all characteristic cases, art is satisfied with a lesser number of interesting ones: as many as fantasy demands in order to produce for itself an image of the whole, in order to dream about it.⁴⁸⁷

⁴⁸⁶ Richard Taruskin, "Reply to Van den Toorn," In Theory Only, 10/3 (1987): 57.

487 The Musical Idea, 93.

⁴⁸⁵ Davis, "Positivistic Philosophy and the Foundations of Atonal Music Theory," 58–59. Davis argues in favour of the particularist position, and critiques the set-theoretical analytic apparatus espoused by Forte (*The Structure of Atonal Music*) and others for its vast generality. Davis concludes that "there is a difficulty in considering the intrinsic relationship between logic and universals as opposed to particulars in a musical context" (vi-vii).

The exceptional case, calling for the exceptional method, at every moment confronts the man who produces art. . . One cannot give [the student] what matters most — the courage and the strength to find an attitude to things which will make everything he looks at an exceptional case, because of the way he looks at it. Here, artistic methods are more liable to do harm than good. To use them means to generalize them, and then they are no long artistic methods but artistic tricks.⁴⁸⁸

Carl Dahlhaus has clarified these issues for music theory by making a critical distinction between theory and analysis. For Dalhaus, "theory" tends to favour the quest for general principles, whereas "analysis" tends to begin with the art work and thus to favour particularism.⁴⁸⁹ Taruskin has also described the central debate between "universalists" and "particularists" within the music theory community. He argues that the scientific virtue of seeking "general laws" is inappropriate, and the pursuit of universals trivial, for music scholarship.⁴⁹⁰

The particularist perspective has a long and distinguished history in art criticism. Samuel Taylor Coleridge eloquently summarized the aesthetic nominalist's position:

Poetry, even that of the loftiest and, seemingly, that of the wildest odes, has a logic of its own, as severe as that of science; and more difficult, because more subtle, more complex, and dependent upon more and more fugitive cases.⁴⁹¹

⁴⁸⁸ "Problems in Teaching Art [1911]," in *Style and Idea*, 366.

⁴⁸⁹ Dahlhaus, Analysis and Value Judgment.

⁴⁹⁰ Richard Taruskin, "A Reply to Brown and Dempster," Journal of Music Theory, 33 (1989): 155–74.

⁴⁹¹ Samuel Taylor Coleridge, *Bibliographia Literaria*, vol. 1, 4.

Perhaps nominalism finds its clearest and most thorough expression in Benedetto Croce's aesthetic nominalism.⁴⁹² Croce, like Schoenberg, was an auto-didact, a fact that may have contributed to their tendency to be disdainful toward normative and institutionalized modes of art criticism.

The Fallacy of the Formalist "Proof". Mathematical-modeling theorists are distinguished from one another by the complexity and elegance of the models they build, but they can rarely be "wrong" in terms of the mathematical systems and relations they describe. Wittgenstein describes tautologies as propositions that are "unipolar" in the sense that they are always true, they can never be falsified.⁴⁹³ Richard Taruskin points to this "unipolarity" in set-theoretical reasoning:

Pitch-class set 'analysis' is incompatible with nothing, as the fact of its universal potential applicability already testifies. It begins not with observation of musical particulars but with a universe of possibilities. The comparison of any music

⁴⁹² Nominalism is the view that all universal terms of language, and all general collective terms are only fictional names (artificial and arbitrary symbols) and have no objective, real existences that correspond to them (Angeles, *Dictionary of Philosophy*, s.v. "Nominalism"). Croce argued that the task of the art critic is to examine the "particular" in the work of art. He cites the division of literature into novels, plays, and poems, categories that he describes as artificial and arbitrary names containing no real critical substance. Like Schoenberg, Croce further asserts that there can be no such thing as bad art; i.e., that the critics role is not an evaluative one. Benedetto Croce, *Aesthetics as the Science of Expression and General Linguistics*, 1902; Myra E. Moss, ed. and trans., *Benedetto Croce: Essay on Literature and Literary Criticism* (Albany: State University of New York Press, 1990).

⁴⁹³ Wittgenstein also groups contradictions together with tautologies in this category of unipolar propositions: "Tautologies and contradictions are not pictures of reality. They do not represent any possible situation (*Sachlage*). For the former admit *all* possible situations, and the latter *nore*" (*Tractatus Logico-Philosophicus*, propositions 4.462, 4.463). That is, contradictions are unipolar in the sense that they can never be true, while tautologies are unipolar in the sense that they are always true.

entity with such a universe yields an inexhaustible quarry of 'true facts' but no criterion of relevance.⁴⁹⁴

As Taruskin points out, to favour set-theoretical "verification" is to make a small concession, since analytic truths are true by definition. Pieter Van den Toorn gives an account of how this fact proved to be a convenient one for the math-modeling branch of music theory. Since "theory," of any kind, requires some form of respectable logical foundation in order to be sanctioned by the positivist-oriented academy, taking umbrage in this radically formalistic branch of music theory provided a posture that was beyond reproach.⁴⁹⁵ Critics of this sub-discipline — in which it is almost impossible to make an assertion that could possibly be wrong — might have been tempted to quote Ira Gerswhin: "Nice work if you can get it!" William Benjamin issues a bold caveat against this aspect of math-modeling. "What disturbs, in the final analysis," he notes "is the possibility that one of our best theoretical minds [Forte] will be content not to ask fundamental questions as long as he can go on making true statements."⁴⁹⁶

⁴⁹⁴ Taruskin, "Reply to Van den Toorn," 57.

⁴⁹⁵ Van den Toorn, *Music*, *Politics*, and the Academy.

⁴⁹⁶ William Benjamin, "Review of *The Structure of Atonal Music* by Allen Forte," *Perspectives of New Music*, 13/1 (Fall-Winter 1974): 190.

WITTGENSTEIN'S REJECTION OF SET THEORY: CHASING CANTOR AND HILBERT FROM PARADISE

Wittgenstein was unrelenting in his attempt to "civilize mathematics" by seeking clarity concerning its epistemological status.⁴⁹⁷ In particular, he stood adamantly opposed to the brand of radical formalism that reduces mathematics to the manipulation of meaningless symbols and ignores actual human experience and use.⁴⁹⁸ Set theory, in particular, became the focus of an intense critique by Wittgenstein. In a reproach against Russell's logicist foundation for: mathematics, Wittgenstein asserts in the *Tractatus* that "the theory of classes is completely superfluous in mathematics."⁴⁹⁹ He pursues this argument with renewed vigour in the later *Remarks on the Foundations of Mathematics*, where his censure is directed in particular toward Cantor (who carried out the first pioneering work in set theory)⁵⁰⁰ and Hilbert (an enthusiastic champion of Cantor's set theory). In Wittgenstein's view, proponents of set theory are guilty

⁴⁹⁷ See, in particular, *Remarks on the Foundations of Mathematics*, a compilation of essays and lectures by Wittgenstein on mathematical topics between the years 1937 and 1939.

⁴⁹⁸ Wittgenstein likewise opposed aspects of conventionalism insofar as the creative and synthetic aspects of mathematical practice – the forming of new and practical concepts – are left unaccounted for. I am grateful to Dr. Anthony Birch for his helpful personal communication concerning this issue, for sharing an unpublished paper on Wittgenstein's approach to mathematics ("Waismann's Critique of Wittgenstein"), and for referring me to V. H. Klenk's *Wittgenstein's Philosophy of Mathematics* (The Hague: Mainus Nighoff, 1966).

⁴⁹⁹ *Tractatus Logico-Philosophicus*, proposition 6.031. Wittgenstein is here attempting to debunk the notion of a logicist foundation for mathematics which underlies Russell's theory of classes (which is related to, but not identical with, set theory proper). See Bertrand Russell, *Principia Mathematica* (London: Geo. Allen & Unwin, 1908).

⁵⁰⁰ J. Dauben, "The Origins of Georg Cantor's Theory of Sets," *Rete*, 2 (1974): 104-34; Philip E. Johnson, *A History of Set Theory*, (Boston: Prindle, Weber and Schmidt, 1972).
of confusing the formal propositions of mathematics with "concepts proper," and thereby of erroneously granting them the status of legitimate objects of knowledge. He expresses skepticism concerning the very idea of there *being* an application for set theory:

If the intended application of mathematics is essential, how about parts of mathematics whose application—or at least what mathematicians take for their application—is quite fantastic?... In set theory, one is doing a branch of mathematics of whose application one forms an entirely false idea.⁵⁰¹

Imagine set theory's having been invented by a satirist as a kind of parody on mathematics.⁵⁰²

For Wittgenstein it is a pernicious error to think of set theory, or any form

of pure mathematics (i.e., taken independently from its applications), as

something that is descriptive of an objective domain beyond mathematics

itself.⁵⁰³ He believed that this error can affect our entire way of thinking about

mathematics and lead us to give an erroneous form of expression to its results.

Moreover, for Wittgenstein, the broad generality of set theory is a symptom of its

⁵⁰¹ Ibid., 259–60. In his category of "formal concepts" Wittgenstein includes not only the axioms of set theory but even the principle of *series*. According to this view, "ordering" is about internal analytic relationships, not the external world. In the *Tractatus* he writes: "I call a series that is ordered by an *internal* relations a formal series. The order of the number-series is not governed by an external relation but by an internal relation" (*Tractatus Logico-Philosophicus*, proposition 4.1252). A further investigation of this idea is warranted, especially as it pertains to Schoenberg's conception of serial technique.

⁵⁰² Remarks on the Foundations of Mathematics, 264.

⁵⁰³ Mathieu Marion notes that Wittgenstein's view is radically "anti-Platonist" in this respect (*Wittgenstein, Finitism and the Foundations of Mathematics*, 1–20). Derived from Plato's theory of universal "forms" or "ideas," the term "Platonism" refers to any view which treats things such as universals, propositions, numbers, etc., as independent and "real" objects of knowledge (Angeles, *Dictionary of Philosophy*, s.v. "Platonism"). Frege was a noted Platonist.

self-referential formalism, and "nothing is more suspect than a generality which is too vast."⁵⁰⁴ G. H. von Wright writes of Wittgenstein's ongoing battle against the premises and practices of set theory:

[Wittgenstein's philosophy of mathematics] fights the influence of set theory cn foundation research and on thinking about the subject. . . . To Wittgenstein, set theory was a cancer rooted deep in the body of our culture and with distorting; effects on that part of our culture which is our mathematics. Had he lived to see the role which set theory has since come to play in many or most countries as a basis for teaching mathematics to children he would no doubt have felt disgusted and perhaps have said that it signalized the end of what used to be known as mathematics.⁵⁰⁵

Wittgenstein viewed Cantor's formulation of set theory as a kind of numerological fetishism, an example of mathematics feeding on itself. Eric Regener has described Forte's application of set theory in precisely this way. "One gets the impression," he writes, "that this involved and somewhat untidy theory ended up by *building on itself*, rather than on sufficiently general considerations of the repertoire it was originally intended to explicate."⁵⁰⁶

Wittgenstein argues that set theory makes the mistake of being *about numbers*, and of purporting to describe some imagined and abstract mathematical reality thereby. To understand the true essence of mathematics, according to Wittgenstein, is to understand its *applicability*. Forte's critics have pursued a

⁵⁰⁴ Waismann, Wittgenstein and the Vienna Circle, 103.

⁵⁰⁵ G. H. von Wright, "Wittgenstein in Relation to his Times" in *Wittgenstein and His Times*, ed. Brian McGuinness (Oxford: Blackwell, 1982), 111–12.

⁵⁰⁶ Regener, "On Allen Forte's Theory of Chords," 211. (Emphasis added.)

similar line of argumentation, asserting that his theory is *about* modulo-12 mathematics itself more than it is about the music under examination.⁵⁰⁷ According to Cora Diamond, this is precisely the approach to mathematics that Wittgenstein rejects:

Wittgenstein says that in a sense mathematical propositions do not treat of numbers. . . . [He] recommends that we not say that '2+2=4' is *about* 2. . . . If you are clear that '30x30=900' is not about 30 in the way that 'Prince has blue trousers' is about Prince's trousers, if you see that it is 'about 30' in the sense that it helps prepare the number-sign '30' for its applications, then you will not imagine the reality corresponding to the mathematical proposition as some sort of realm of numbers. The realm with which we are concerned, when we work out mathematical propositions, is found by considering their application.⁵⁰⁸

Wittgenstein wished to demonstrate that the similarities of grammatical

appearance between mathematical and experiential propositions are misleading,

that they conceal from us fundamentally differing kinds of relationship to

reality:509

His treatment of metaphysical confusion about mathematics involves getting us to recognize that mathematical propositions are not '*responsible to reality*' in the same sort of way ordinary experiential propositions are. . . . [Everything that] can be said, on Wittgenstein's view, about mathematical propositions waits for an examination of them: of the practices through which we arrive at them, the practices in which they are taught, and those in which they are applied.⁵¹⁰

⁵⁰⁷ Benjamin, "Review of *The Structure of Atonal Music* by Allen Forte," 171.

⁵⁰⁸ "Wittgenstein, Mathematics, and Ethics," 235–36.

⁵⁰⁹ Lectures on the Foundations of Mathematics, 238-56.

⁵¹⁰ Diamond, "Wittgenstein, Mathematics, and Ethics," 237–38. For example, Wittgenstein writes: "It is essential to mathematics that is signs are also employed in *mufti* [plain clothes worn by an officer who has the right to wear a uniform]. It is the use outside mathematics, and so the *meaning* of the signs, that makes the sign-game into mathematics" (*Remarks on the Foundations of Mathematics*, 257 [c.f. 232-258-60, 295, 376]). Hans-Johann Glock clarifies this aspect of Wittgenstein's position: "This does not mean that all parts of mathematics must have direct empirical application, but only

Wittgenstein held firmly to this view. He felt that forms of mathematics

that turn away from their applications, and back onto themselves, are akin to a

form of alchemy:

It is the earmark of this mathematical alchemy that mathematical propositions are regarded as statements about mathematical *objects*, and so mathematics as the exploration of these objects. In a certain sense it is not possible to appeal to the meaning of the signs in mathematics, because it is only mathematics that gives them their meaning. What is typical of the phenomenon I am talking about is that a *mysteriousness* about some concept is not *straight away* interpreted as an erroneous conception, as a mistake of ideas, but rather as something that is . . . to be respected.⁵¹¹

[Such mathematical propositions] seem to belong simply and solely to mathematics, seem to concern, as it were, the natural history of mathematical objects themselves. One would like to say of [them that they] introduce us to the mysteries of the mathematical world. *This* is the aspect against which I want to give a warning.⁵¹²

Lewis Rowell gives the following account of the formalist's conception

of music:

To appreciate the position of those who advocate rigorous order in their music, it is essential to realize that many composers find the same intense satisfaction in the play of intellect that generates a rich tapestry of musical relationships that the mathematician takes in constructing an intricate theorem.⁵¹³

that those which do not must be connected with parts that do. There is no pure mathematics without *some* applied mathematics. Mathematics *would* be just a game if it did not play a role within our empirical reasoning" (*A Wittgenstein Dictionary* [Oxford: Blackwell, 1996], 235).

⁵¹¹ Remarks on the Foundations of Mathematics, 274.

⁵¹² Ibid., 137.

⁵¹³ Lewis Rowell, *Thinking About Music: An Introduction to the Philosophy of Music* (Amherst, Mass.: University of Massachusetts Press, 1983), 233.

Rowell is describing precisely the kind of "play of intellect," devoid of contact or dialogue with real-world concerns, that Wittgenstein opposed in set theory. Hilbert's resounding endorsement of set theory is well known: "No one shall be able to drive us from the paradise that Cantor created for us."⁵¹⁴ Wittgenstein's reply to Hilbert is both rhetorical and terse. "I would try to show you," he insisted, "that it is not a paradise – so that you will leave of your own accord."⁵¹⁵

LOGICAL AND MATHEMATICAL FORMALISM AS "SCAFFOLDING"

None of the foregoing should tempt the reader to conclude that Wittgenstein considered logical and mathematical propositions to be worthless by virtue of their formalism. Wittgenstein adds crucial qualifications to his commentary in this regard. With respect to logic, Wittgenstein maintained that even if tautologies say nothing about the world, they are not therefore unimportant. They "say nothing" and they "lack sense," but they "are not nonsensical.... They are part of the symbolism."⁵¹⁶ That is, although logical tautologies indeed lack "sense" inasmuch as they are not "about the world," they

⁵¹⁶ *Tractatus Logico-Philosophicus*, propositions 4.461 and 4.4611.

⁵¹⁴ David Hilbert, "On the Infinite [*Über das Unendlische*, 1926]," in *From Frege to Gödel: A Source Book in Mathematical Logic*, ed. J. van Heijenoort, trans. S. Bauer-Mengelberg (Cambridge: Harvard University Press, 1967), 376. Cited in Barrow, *Pi in the Sky*, 213.

⁵¹⁵ Lectures on the Foundations of Mathematics, 103. Numerous mathematicians and philosophers have more recently taken up Wittgenstein's general line of argumentation against the epistemological foundations and assumptions of set theory. For example, see Max Black "The Elusiveness of Sets," in *Philosophy and Mathematics*, ed. Robert Baum (San Francisco: Freeman, 1983).

are not propositional "nonsense" or "gibberish" (the status Wittgenstein grants to the metaphysical propositions, for example). By examining logical propositions, Wittgenstein maintained, we at least learn something *about* logical form. Wittgenstein is here applying one of his central philosophical tenets to logical tautology: its importance can be shown but not stated.⁵¹⁷ For Wittgenstein, logical propositions *show* something important about the nature of the structure of logical form, they "are part of the symbolism," they provide the "scaffolding" upon which we "construct a world."⁵¹⁸

Wittgenstein applies a very similar kind of reasoning in his account of the status of the propositions of mathematics. On the one hand, he says that "calculating, if it is to be practical, must be grounded in empirical facts."⁵¹⁹ On the other hand, he acknowledges, it often "takes mathematics to define the *character* of what you are calling a 'fact.'" Here Wittgenstein offers a simple example. "It is interesting to know *how many* vibrations this note has!" he writes, "But it took arithmetic to teach you this question; it taught you to see this kind of fact."⁵²⁰ In this way, mathematics, like logic, can provide a particular kind of "scaffolding" upon which we construct the facts of the world. "If you know a mathematical

⁵²⁰ Ibid., 381.

⁵¹⁷ See Mounce's discussion in Wittgenstein's Tractatus: An Introduction, 43.

⁵¹⁸ *Tractatus Logico-Philosophicus*, propositions 4.023 ("... The proposition constructs a world with the help of a logical scaffolding ...") and 6.124 ("The logical propositions describe the scaffolding of the world, or rather they represent it. They have no subject matter").

⁵¹⁹ Remarks on the Foundations of Mathematics, 383.

proposition," Wittgenstein writes, "that is not to say you yet know *anything*, i.e., the mathematical proposition is only supposed to supply a framework for a description."⁵²¹ For Wittgenstein, logic and mathematics *enable* meaningful propositions and descriptions, but they are not meaningful in themselves. They describe not the world, but rather rules for describing the world.

This reasoning might be extended to the application of set theory to music analysis. Even if we assert that set theory provides nothing more than an elaborate system of formalistic propositions, we need not necessarily conclude that it is therefore meaningless and unimportant. That is, even if we accept the views of Forte's harshest critics, we might regard his system as a careful unfolding of the structural form and implications of the "scaffolding" upon which twelve-tone and atonal music rests, even if it says nothing about the music in question, *per se*. William Benjamin states precisely this view. Forte's method, he observes, "is essentially pre-analytic, since its field of operation is the mod-1.2 pitch-class universe, and not a body of music which partakes of that universe."⁵²²

There is some evidence that Schoenberg may have understood harmony in this way. In a striking parallel to Wittgenstein's assertion that "the logical

⁵²¹ Ibid., 356.

⁵²² Benjamin, "Review of *The Structure of Atonal Music* by Allen Forte," 171.

scaffolding surrounding a picture determines the logical space,"⁵²³ Carpenter and Neff note that Schoenberg felt that "harmony is the scaffolding of the musical space."⁵²⁴

THE PROPER ROLE OF MATHEMATICAL MODELING: WITTGENSTEIN'S CONSTRUCTIVIST VIEWPOINT

In his writings on the foundations of mathematics, Wittgenstein emphasized another important perspective. While maintaining that mathematical propositions are not meaningful in themselves – that they have no "content," properly speaking – he acknowledged that they can nonetheless be indispensable intellectual devices. He did not deny that, when *applied* to reality (i.e., to empirical facts), mathematics can help us to arrive at insights that are difficult or impossible to attain by other means.⁵²⁵ Wittgenstein's concern about the abuse and misuse of mathematics centered on some of the conclusions that he felt had been erroneously derived from its more abstract forms (set theory, for example). What put him ill at ease with set theory was the very idea of proclaiming the existence of something that can be neither seen nor mastered. He was not so much concerned with other forms of applied mathematics that have been enlisted as aids – as "mathematical-modeling" devices – to describe and measure the world. "I should like to say [that] mathematics is a motley

⁵²³ *Tractatus Logico-Philosophicus*, proposition 3.42.

⁵²⁴ Carpenter and Neff, Commentary on *The Musical Idea*, 61.

⁵²⁵ Engelmann, Letters, 105.

mixture of techniques of proof," he wrote, "and upon this is based its manifold applicability and its importance."⁵²⁶ According to this view, mathematics may not be able to tell us anything about the world, but it *can* serve as an effective short-hand method for expressing complex experiential propositions. He thus conceived of mathematics as a kind of elaborate "abacus,"⁵²⁷ a way of linking propositions about the world together in a particularly efficient way. This has been described as Wittgenstein's so-called "constructivist" or "operationalist" perspective on mathematics.⁵²⁸ The constructivist approach is one that understands mathematical concepts only *in action*. It is opposed to any static notion of mathematical concepts as things that are real and true in themselves, independent of their applications. Wittgenstein's mathematical constructivism can be understood as another manifestation of one of the over-riding themes that informs his entire philosophical outlook. Here, as in ethical matters, he

⁵²⁶ Remarks on the Foundations of Mathematics, 176.

⁵²⁷ Philosophical Remarks (Oxford: Blackwell, 1975), 157; Marion, Wittgenstein, Finitism and the Foundations of Mathematics, 3.

⁵²⁸ See Gargani, "Techniques descriptives et procédures constructives"; Marion, *Wittgenstein, Finitism and the Foundations of Mathematics.* "Constructive mathematics" is defined as a form of mathematics that is "distinguished from its traditional counterpart, classical mathematics, by the strict interpretation of the phrase 'there exists' as 'we can construct.' . . . Although certain individuals – most notably Kronecker – had expressed disapproval of the 'idealistic' nonconstructive methods used by some of their nineteenth-century contemporaries, it is in the polemical writings of L. E. J. Brouwer (1881-1966), beginning with his 1907 Amsterdam doctoral thesis and continuing over the next forty-seven years, that the foundations of a precise, systematic approach to constructive mathematics were laid" (*Stanford Encyclopedia of Philosophy*, Online edition, 2001, s.v. "Constructive Mathematics"). Hermann Weyl, once Hilbert's most prominent student at Göttingen, eventually rejected Hilbert's formalistic meta-mathematics in favour of Brouwer's constructivist intuitionism. See Weyl, *The Open World: Three Lectures on the Metaphysical*

advocates *action* over the expression of abstract principles and theories. "We cannot describe mathematics," he insists, "we can only do it (and that of itself abolishes every 'set theory')."⁵²⁹

Adopting Wittgenstein's view does not therefore require us to conclude that mathematics is unable to help us point to significant musical entities and processes. He wanted us to realize, however, that whether it can do so meaningfully depends on how we formulate the pointing process, and not on the supposed mysteries of the mathematics alone. Perle's rejection of Forte's theory was implicitly founded on a similar concern:

I would not want you to suppose that my rejection of Allen Forte's theory of pitch-class sets implies a rejection of the notion that there can be such a thing as a pitch-class set. It is only when one defines everything in terms of pitch-class sets that the concept becomes meaningless.⁵³⁰

THINGS VERSUS FACTS AND "STATES OF AFFAIRS": A THEORY OF CHORDS VERSUS A THEORY OF HARMONY

The early Wittgenstein understands logical propositions as a way of

"picturing" (or "modeling") the world,⁵³¹ and he tells us that the logical picture

Implications of Science. See also Barrow's chapter "Intuitionism: the Immaculate Construction," in *Pi in the Sky*, 178–245.

⁵²⁹ Philosophical Remarks, 159.

⁵³⁰ George Perle, *The Listening Composer* (Berkeley and Los Angeles: University of California Press, 1990), 67.

⁵³¹ Donald Peterson cautions against translating the German *Bild* exclusively as 'picture,' given that "[It] can equally be translated as 'model,' in which case the implication of spatial structure is not so great" (*Wittgenstein's Early Philosophy*, 27-28).

we build "reaches right out" to reality,⁵³² it is "laid against reality like a measure."533 Building on this idea he states, in the opening propositions of the *Tractatus*, a critical distinction between facts and things: "The world is the totality of facts, not of things."⁵³⁴ According to this view, individual things are not, in themselves, truly objects of knowledge. Rather, it is any imaginable combination of things that constitutes a "state of affairs" (Sachverhalten). When such a combinational relationship or state of affairs is actually *obtained in the world*, a "fact" is created: "What is the case – a fact – is the *existence* of states of affairs."⁵³⁵ The conclusion drawn from the first few pages of the *Tractatus* is that the world is the totality of facts (or obtained "states of affairs"), which are made up of fitting *together objects* in a determinate way. Logic does not determine any fact, but only what combinations are possible. "In a state of affairs objects fit into one another like links in a chain," Wittgenstein writes, invoking a helpful analogy to illustrate his point. "[They] stand in a determinate relation to one another."⁵³⁶ Thus a state of affairs, like a chain, is not just a collection of things, but a collection that is bound together in a determinate way.537

⁵³⁵ Ibid., proposition 2. (Emphasis added.)

⁵³⁶ Ibid., propositions 2.03 and 2.031.

⁵³⁷ Wittgenstein's distinctions between "things," "facts" and "states of affairs," gave rise to a heated debate with Russell concerning existential propositions. After initiating the debate by saying

⁵³² Tractatus Logico-Philosophicus, proposition 2.1511.

⁵³³ Ibid., proposition 2.1512.

⁵³⁴ Ibid., proposition 1.1.

In light of this conception of reality, consider the application of set-theory

to musical structure. A key component of Benjamin's critique of Forte's theory

hinges on his assertion that it is concerned with "things" rather than with

relationships. According to this view, set theory is deficient in a critical

component. It fails to give an adequate account of functional relationships:

My complaint is that [Forte's] derivations are based exclusively on formal relationships between pitch-class sets and not on what are usually called functional relationship. A functional relationship describes the role of one musical object with respect to another and normally gives the object thus characterized a name.⁵³⁸

James Davis states a corroborating viewpoint:

A pitch-class or pitch-class set is not defined in its relation to other pitch-class entities. They are autonomous beings, whose existence is neither dependent upon nor altered by the existence of any other such entities. Likewise, there is no contextual process which governs the domain of such entities. There are mathematical and logical operations which may be enacted upon them, but there are no "rules" or "laws" which govern motion to or from them. As Edward T. Cone so convincingly showed, the relations demonstrated in positivistic theory seem to be severely lacking in even the most basic of musical characteristics, such that an entire atonal composition could be inverted and the same positivistic operations would be equally applicable on one version as on the other. Musically speaking, then, there is no cause and effect to seek in the realm of logical/musical fictions. There is no reason why one collection follows another. The analyst is left to identify the elements; having done so, he or she may look for abstract patterns into which these elements may fall to complete the analysis.⁵³⁹

"suppose I state 'there is an rhinoceros in this room!" Wittgenstein insisted, over Russell's vigorous protest, on the validity of his proposition (Monk, *Ludwig Wittgenstein*, 40).

⁵³⁸ Benjamin, "Review of *The Structure of Atonal Music* by Allen Forte," 181.

⁵³⁹ Davis, "Positivistic Philosophy and the Foundations of Atonal Music Theory," 95-96 (see also p. 84). Davis cites Edward T. Cone, "Beyond Analysis," in *Music: A View from Delft*, ed. R. P. Morgan (Chicago: University of Chicago Press, 1989).

Eric Regener has likewise argued that it is precisely this concern with "objects," rather than their relations, which differentiates a "theory of chords" from a "theory of harmony." Like Davis, he describes the failure of set theory to adequately account for *relationships*:

A theory of harmony differs from a theory of chords, presumably, in that it [the former] deals with relationship based on succession in time ("progression"). Since Forte's theory does not deal with temporal relationship in any such systematic way, it therefore seems appropriate to consider it basically a theory of chords.⁵⁴⁰

The notion of *relations* between tones, intervals, and chords is very much

central to Schoenberg's conceptual framework. It is fully embodied in his general

description of the "musical idea," and the "tonal problem," for example:

Every tone which is added to a beginning tone makes the meaning of that tone doubtful. . . . In this manner there is produced a state of unrest, of imbalance which grows throughout most of the piece, and in enforced further by similar functions of the rhythm.⁵⁴¹

Every tonal progression, every progression of even two tones, raises a problem which requires a special solution. Yet the further such tones are brought into relations and contrast with each other and with rhythm, the greater is the number of possible solutions to the problem, and the more complex are the demands made on the carrying out of the musical idea.⁵⁴²

⁵⁴¹ "New Music, Outmoded Music, Style and Idea [1946]," in *Style and Idea*, 123.

⁵⁴⁰ Regener, "On Allen Forte's Theory of Chords," 193. Later in his essay, Regener cautions that "It must not be thought... that we intend to disparage Forte's 'theory of atonal music' by calling it a 'theory of chords'." Benjamin has also written further about set-theory's failure to account for temporal order and structure: "If everything one says about the relationship between two sets remains true when their order is reversed, the relationship, to the extent that it is defined, is not a functional one" (Benjamin, "Review of *The Structure of Atonal Music* by Allen Forte," 182).

⁵⁴² "Problems of Harmony [1934]," in *Style and Idea*, 269. See also Murray Dineen, "Problems of Tonality: Schoenberg and the Concept of Tonal Expression" (Ph.D. Dissertation, Columbia University, 1988).

Thus, for Schoenberg, tones and chords are meaningless as independent entities: a "musical idea" arises only when tones are brought into a particular *relationship* with one another.⁵⁴³ This idea seems to bear some kinship with Wittgenstein's notion of a "state of affairs," according to which "things," abstractly conceived in isolation, are neither facts nor states of affairs. It is only when things are *combined* in some particular way, when they are brought into relationship with one another, that we can speak of a state of affairs.

This idea is also embodied in the particular kind of combinational logic of harmonic progression that Schoenberg introduced in the principle of complementation. In affirming that "the progression of chords can be justified by the chromatic scale, the tendency to include in the second chord tones that were missing in the first,"⁵⁴⁴ Schoenberg proposes a new kind of logic underlying harmonic progressions and relationships, rather than an atomistic view which considers harmonic entities as things in themselves.

Consider also how Schoenberg employs a quadratic-equation to describe the essence of counterpoint:

Counterpoint means an 'opposing point' whose *combination with the original pcint* is needed if the idea is to exist. The opposing point may contain the completion:

⁵⁴³ Further, Schoenberg viewed the compositional process largely as one of "solving," or bringing to some kind of resolution, the "tonal problem" which these tonal relationships set up (see fn. 32, above). Curiously, Wittgenstein apparently held a completely analogous view of the processes involved in the temporal arts such as cinema, for example. Wittgenstein felt a film must strive to arrive at a satisfactory denouement, a solution to the dramatic "problem" posed throughout its progress: "It seems to me . . . that art must always, in one sense or another, lead to a solution; the individual work of art, then, is an example demonstrating such a solution" (Engelmann, *Letters*, 93).

⁵⁴⁴ *Theory of Harmony*, 420. See fn. 47, above.

 $(a+b)(a-b) = a^2-b^2$, so that a^2-b^2 means, as it were, the idea represented by the point (a+b) and [its] opposite point (a-b).⁵⁴⁵

In this algebraic analogy, Schoenberg is again expressing an interest in a particular kind of *combinational* thinking. He also implicitly demonstrates an interest in the nature of mathematical abstraction and tautology, even if he expresses himself vaguely and imprecisely on the subject. He is interested in the way the mathematical entities on one side of the equation combine to "mean" the resultant and emergent "idea" which is formed on the other.⁵⁴⁶ Though Schoenberg seems to underestimate the importance of the multiplication-operator in his example, and fails to explain why he considers the terms on the left-hand side of the equation (a+b and a-b) as mathematical "opposites,"⁵⁴⁷ he clearly shows a fascination with the notion of mathematical equivalence and tautology.

The account given in this chapter of Wittgenstein's conception of logical tautology and mathematical formalism has been a necessarily simplified one. Nonetheless, I have been able to bring some of Wittgenstein's ideas to bear on a variety of issues relating to formalism and the application of mathematical

⁵⁴⁵ Schoenberg, "Linear Counterpoint [1931]," *Style and Idea*, 290. Recall that quadratic expressions are simplified by applying the "FOIL" rule. That is, in Schoenberg's example, a^2-b^2 is arrived at by multiplying the First, Outside, Inside, and Last terms within the brackets, i.e., (a+b) $(a-b) = a^2 - ab + ab - b^2 = a^2 - b^2$.

⁵⁴⁶ See also Michael Cherlin's discussion of Schoenberg's algebraic analogy in "Dialectical Opposition in Schoenberg's Music and Thought," *Music Theory Spectrum*, 22/2 (Fall, 2000): 171.

⁵⁴⁷ Schoenberg's example is mathematically unconvincing: when the "opposites" are removed from his example (as in $(a - b) (a - b) = a^2 - 2ab + b^2$, for example), it is unclear how the result differs in any mathematically meaningful sense.

modeling to the analysis of music. I have argued that Schoenberg was also centrally concerned with some of the issues that we have discussed in this chapter.

Claudio Spies suggests that Schoenberg would have been fascinated and illuminated to learn of Babbitt's mathematical elaboration of his system:

It is absolutely uncanny that Schoenberg intuitively recognized those [settheoretical] properties of his materials – to which we now attach names, dimensions, and a whole specialized nomenclature – that constitute hallmarks of his art, and which he could therefore put to wondrously rich and varied uses, whereas much in the realm of the twelve-tone system's theory escaped his notice. In view of this apparent paradox, one is tempted to fantasize on a lively discussion between Schoenberg and Milton Babbitt on the subject of combinatoriality! More's the pity that it never took place.⁵⁴⁸

Enlisting the aid of Wittgenstein's conceptual framework, I have attempted to build the contrary argument, i.e., that Schoenberg may have disagreed with some aspects of the approach that was developed by Babbitt, Forte, Lewin, and other post-war set-theorists, more than may be commonly assumed.

Without doubt, the issues and problems surrounding mathematical reasoning were at the very forefront of the Viennese *Weltauffassung* that evolved during the inter-war years. For Schoenberg, Wittgenstein, and the Vienna Circle, thinking about the foundations of mathematics may have been a source of comfort, even if a maddeningly elusive one:

⁵⁴⁸ Claudio Spies, "Schoenberg's Influence on Composing in America," 761.

There was a place where all the rules governing the inner structures of things came together, and this was mathematics. Mathematics was the mother tongue of the human race, into which the whole world could be translated. It was a kind of monastery, chaste, discipline and entirely true. It was everything that Vienna was not.⁵⁴⁹

⁵⁴⁹ Terry Eagleton, *Saints and Scholars* (London: Verso, 1987): 38.

Chapter 5: Summary and Conclusions

In a hostile review that appeared when *Style and Idea* was first published, Schoenberg's ideas were described as unorganized, obscure, and inconsistent. The reviewer asserted that "the results of [his] undisciplined thinking simply cannot bear scrutiny."⁵⁵⁰ I have attempted to refute this view of Schoenberg. By sifting through the wide-ranging and sometimes bewildering array of ideas one encounters in Schoenberg's writings, I believe that I have identified a rock-solid epistemological consistency at the core of his thought, one that was very much in step with Wittgenstein, and thereby with the most enlightened and forwardlooking stream in the history of twentieth-century ideas. Looking back over the territory I have covered, we may now take a synoptic view of the common themes that I have identified. I have argued that Schoenberg and the early Wittgenstein adopted strikingly similar positions concerning twelve major epistemological meta-themes:

1. **The Icarus Principle**: The assertion that "facts" are the only things we can speak about productively, and that aesthetics and art theory should be concerned exclusively with pointing to these facts, and with making comparisons. The facts of music theory are subsumed within three of the four categories described in chapter 2: synthetic-facts concerning sound, perception and cognition (p. 33), analytic-facts concerning the structure of musical systems (p. 35), and style-facts concerning repertories of writter music (p. 38).

⁵⁵⁰ Harold Brown, "Review of Style and Idea by Arnold Schoenberg," The Nation (July 8, 1950), 43.

- 2. **Wittgenstein's "Stop":** The assertion that to attempt to use language to address metaphysical propositions concerning value and aesthetics is to misuse language and to fail to understand the limits of its reach. In chapter 2, we saw that many of the traditional claims of music theory fall under the category of metaphysical propositions (p. 41).
- 3. **The "Is/Ought" Dichotomy**: The assertion that any "foundationalist" or absolutist approach to questions of value and aesthetics is untenable; i.e., that we cannot support aesthetic value-judgments by appealing to epistemological foundations. Facts themselves cannot be enlisted to inform our understanding of what to do with or about them.
- 4. **Important Nonsense (the Value of Values)**: The assertion that, despite our inability to co-opt the language of knowledge to speak meaningfully about values (meta-themes #2 and #3, above), questions concerning value are precisely the ones that matter most in life and art.
- 5. **Contemplation of the Art-Object** *Sub Specie Aeterni*: The assertion that our role in the presence of art is not so much to judge as to contemplate. The artist's task is to present us with objects of contemplation. The art-object embodies its own value. (In this respect the writings of Schoenberg and Wittgenstein bear witness to the powerful influence of orientalist aspects of Schopenhauer's philosophy and cosmology).
- 6. **Theories as Frameworks:** The assertion that theories are largely "systems of presentation" or "ways of speaking" about phenomena. These theoretical frameworks (or conventions) are relativistic in the sense that they hold no claim to universal truth beyond their own terms.⁵⁵¹
- 7. **Rejection of "Heart and Brain" Dualism:** The assertion that the world of feelings is inseparable from the world of the intellect; they are one and the same.
- 8. **The Formal Autonomy of Logical and Mathematical Structure**: The assertion that formal, self-enclosed, "rule-governed-ness" is a defining characteristic of language, logic, mathematics, and modernist art. These formalisms are *about* their own structure, they are not about the world in any meaningful sense.

⁵⁵¹ It must be reiterated, however, that Wittgenstein did not fully ascribe to the Vienna's Circle's conception of "conventionalism" (see pp. 122–127, above).

- 9. **Word-to-World Correspondence**: The assertion that any form of representation must be answerable to reality. Notwithstanding their characteristic formalisms, language (for the early Wittgenstein) and music (for Schoenberg) are not merely symbolic games. For the early Wittgenstein, language points to the real world and must be understood in this way. He stressed how the propositional calculus of the *Tractatus* applied to real-life and real-world situations. Schoenberg stressed how his conception of musical logic applied to real material musical artworks manifest in sound and cognition.
- 10. **"The World is the Totality of Facts, Not of Things":** The assertion that individual things are not, in themselves, truly objects of knowledge. For Wittgenstein, logic does not determine any fact, but only what combinations are possible; it is any imaginable *combination* of things that constitutes a picturable "state of affairs" and a potentially obtainable fact. Similarly, Schoenberg's harmonic thinking is oriented toward *combinations* and *relationships* rather than toward individual harmonic entities in themselves. In this way, his theory is truly a "theory of harmony" rather than a "theory of chords."
- 11. **The Equation of Ethics and Aesthetics:** The assertion that ethics and aesthetics are inseparable; they are one and the same.
- 12. In the Beginning was the Deed: Whether it is a composer creating an aesthetic object or a person committing an ethical *act*, both are indisputably acting in the world, contributing to new and irrefutable facts of the world. "Doing" and "showing" are therefore not subject to the epistemological pitfalls inherent in speaking, conceptualizing, and theorizing about the arts and ethics.

Chapters 2 and 3 were largely devoted to a discussion of meta-themes #1 to

#7. The twenty-first-century reader will be struck by a seemingly paradoxical

feature that characterizes the position outlined in these meta-themes, taken

collectively. By reconciling facts and values within a pervasive unity of thought,

this framework achieves a balance that has evaded music-theoretical

epistemology ever since. The program of "positivist" music theory has often

been described as one that is fundamentally antithetical to the more relativistic

approaches favoured by the postmoderns.⁵⁵² With respect to meta-themes #1, #2, and #3, Wittgenstein and Schoenberg are indeed aligned with the fact-finding positivists. With respect to meta-themes #4, #5, #6, and #7, however, their position aligns itself with the postmodern relativists. Viewed from our contemporary vantage point it seems remarkable that Wittgenstein and Schoenberg achieved such a balance, one that is capable of embracing these seven meta-themes and enabling them to co-exist within a single epistemological framework. Perhaps the most salutary outcome of a synoptic examination of the writings of Schoenberg and Wittgenstein is that it points toward a reconciliatic n of some of these polar dichotomies that have characterized recent debates in music theory.⁵⁵³ Wittgenstein's rare capacity to bridge this gap is what led Jean-François Lyotard to describe his philosophy as "an epilogue to modernity and a prologue to an honourable postmodernity."⁵⁵⁴

In chapter 4, I examined meta-themes #8 and #9, ideas that have been of particular moment for both twentieth-century philosophy and music theory. By advancing meta-theme #8, Wittgenstein gave impetus to the analytic movement in philosophy and science, and Schoenberg gave voice to the

⁵⁵² For example, see Guck, "Music Loving," 201-212; Kramer, *Classical Music and Postmodern Knowledge*; Maus, "Humanism and Musical Experience"; McCreless, "Contemporary Music Theory and the New Musicology."

⁵⁵³ Brown, "Adrift on Neurath's Boat"; Agawu, "Analyzing Music Under the New Musicological Regime."

⁵⁵⁴ Jean-François Lyotard, *The Differend* (Minneapolis: University of Minnesota Press, 1988), xiii.

formalistic approach that came to define musical modernism. Both, however, resisted the temptation to divorce their conception of formalism from the material facts of the world (meta-theme #9). We have seen that later logical positivists and music-theoretical formalists adopted a more radically formalistic viewpoint.

Meta-theme #10 may point to an inconsistency in Schoenberg's conception of harmony. The view that a theory of harmony is truly about relationships and progressions may be somewhat at odds with the more *atomistic* focus suggested by meta-theme #4, according to which harmonic events (complex dissonant sonorities, for example) are to be contemplated for their own qualities, without regard for traditional contextual concerns. This apparent contradiction in Schoenberg's thought warrants further study.

The Wittgenstein-Schoenberg framework culminates in meta-themes #11 and #12, the most general and all-embracing postulates in their worldview.

In the investigation that I have undertaken, I have attempted to correct the misconception, as expressed by Pamela White, that "Schoenberg was not influenced by the more 'progressive' logical positivist school of Wittgenstein and others, in vogue in Vienna in the second two decades of the twentieth century."⁵⁵⁵ Refuting this view has been my principle goal. While I have not uncovered any new evidence of direct *influence* between Schoenberg and the early Wittgenstein, I have argued that any attempt to deny the strong *affinity* between their ideas

⁵⁵⁵ White, Schoenberg and the God-Idea, 229.

simply collapses under the sheer weight of the evidence. I have built my case by scrutinizing their ideas, and the common influences they shared, side by side. We have seen that there is a very concrete correspondence between the ideas of Schoenberg and Wittgenstein with respect to the meta-themes that I have enumerated above. There is also an extraordinarily similar conception of self *e* nd world that imbues their writings throughout, a conception to which the evolving social, political, and cultural situation in early twentieth-century Vienna no do Jbt gave rise.⁵⁵⁶ The luxury of historical distance has undoubtedly helped to bring the full extent and nature of the Schoenberg-Wittgenstein relationship into sharper focus.

In the opening paragraph of their manifesto, Hahn, Carnap, and Neurath describe how it first became apparent that a community of like-minded thinkers—one that could be loosely described as a "circle"—was coalescing in Vienna in the early twentieth century. This was not a formal or institutionalized association. The Vienna Circle owed its existence to a common bond of convictions that its members held with a remarkable degree of unanimity:

This circle has no rigid organization; it consists of people of an equal and basic attitude . . . each puts common ties in the foreground. . . . In many cases one can deputize for another, the work of one can be carried on by another.⁵⁵⁷

⁵⁵⁶ See fn. 170, above.

⁵⁵⁷ Hahn, Neurath, and Carnap, "The Scientific Conception of the World," 299.

We know that Wittgenstein was an honorary member and figurehead of the group. I have argued that by drawing its perimeter only slightly wider, this circle of likeminded Viennese intellectuals can be made to embrace Arnold Schoenberg.

We have seen that the views outlined in *Harmonielehre*, Schoenberg's first published treatise, bear a striking resemblance to many of those expressed in Wittgenstein's *Tractatus*, published ten years later. Perhaps we might even regard the *Harmonielehre* as a document that foreshadows the *Tractatus* in several important respects, just as the *Tractatus* foreshadows later developments in logical positivism. Jane Kallir has noted that "artistic causes became rallying cries for Vienna's intellectual community, and aesthetic issues occasioned farreaching philosophical debates."⁵⁵⁸ Perhaps it was aesthetic issues that fueled philosophical debates, and not the inverse, as we might be inclined to assume. Ultimately, however, the search for such clear lines of cross-fertilization between Vienna's musical and philosophical circles may be futile and unnecessary. The evidence that I have presented for associating Schoenberg with Wittgenstein must be evaluated on its own merits.

Wittgenstein fervently wished to investigate the nature of musical language, but he feared that in doing so he would encounter great difficulty in expressing his ideas.⁵⁵⁹ "It is impossible for me to say one word about all that

195

⁵⁵⁸ Jane Kallir, Arnold Schoenberg's Vienna (New York: Gallérie St. Étienne, 1984), 8.

⁵⁵⁹ Mathieu Marion recalls a fascinating anecdote that illustrates Wittgenstein's curiousity about the structure of music. According to Michael Dummett (Marion's dissertation advisor at Oxford),

music has meant in my life," he mused. "How then can I hope to be understood?"⁵⁶⁰ Engelmann's memoirs confirm this image of Wittgenstein as a philosopher who was desirous, but wary, of writing about music:

To watch Wittgenstein listening to music was to realize that this was something very central and deep in his life. He told me that this he could not express in his writings, and yet it was so important to him that he felt without it he was sure to be misunderstood.⁵⁶¹

In spite of these misgivings, Wittgenstein liberally sprinkled his lectures and books with musical metaphors and commentaries.⁵⁶² These musings add colour and illustration to Wittgenstein's arguments, but, in general, they also tend to show his relative lack of expertise concerning the theoretical aspects of music. Even if Wittgenstein had been better equipped to discuss music, his somewhat restricted taste for contemporary composition may have undermined his ability to carry out an objective analysis of the important and current issues at hand. In the end, I would argue that Wittgenstein's comments on music are relatively trivial in comparison to the broader significance of his early philosophy for music theory. Schoenberg's writings, on the other hand, explore the musical

⁵⁶⁰ Drury, "Some Notes on Conversations with Wittgenstein," 79.

⁵⁶¹ Drury, "Ludwig Wittgenstein Symposium (II)," 164.

⁵⁶² These writings were never consolidated into a book or chapter. A recent book by Martin Alber discusses Wittgenstein's remarks on music (*Wittgenstein und die Musik* [Innsbruck: Hayman, 2000]). A recent article by Leon Botstein's also touches briefly upon the significance of Wittgenstein's thoughts about music ("Cinderella; or Music and the Human Sciences," 132).

on one occasion Wittgenstein allegedly interrogated G. E. Moore's son, jazz pianist Timothy Moore, concerning syntactico-structural aspects of the language of jazz.

implications of radically new ideas that were circulating concerning language and aesthetics. The unfolding of his theory is guided by an expert, experienced, and visionary musical mind. In some respects, Schoenberg can be thought to have effectively carried out Wittgenstein's project in the domain of music theory and aesthetics. Certainly his writings constitute a closer approximation to a truly "Wittgensteinian" music theory than anything Wittgenstein could possibly have written.

There may seem to be nothing especially novel in my suggestion that Schoenberg's musical modernism was an outgrowth of a broad range of influences that converged in early twentieth-century Vienna. One of the many consequences of my thesis, however, is that it requires us to view Schoenberg as a committed positivist – a somewhat elusive and qualified positivist of Wittgenstein's stripe, but a positivist nonetheless. This is perhaps at odds with our traditional conception of Schoenberg's place in intellectual history. Music scholarship has generally tended to interpret Schoenberg's theory and aesthetic as an outgrowth from pre-war developments in the arts in general (notably expressionism) and from evolutionary trend lines projected forward from the nineteenth century (notably from Wagner, Liszt, and Brahms).⁵⁶³ Instead, I have considered Schoenberg's thought in the light

⁵⁶³ Namely, the process of the dissolution of tonality, well captured in the following account by Dane Rudhyar: "If tonality means the divine right of the tonic, then the rise of individualism ir the romantic era was bound to manifest itself in music as the breakdown of tonality . . . Liszt and Wagner became powerful agents in fostering such a process" (*The Magic of Tone and the Art of Music* [Boston : Shambala Press, 1982], 103). See also Frisch, *Brahms and the Principle of Developing Variation*; idem., *The Early Works of Arnold Schoenberg*, 1893-1908 (Berkeley and Los Angeles:

of revolutionary inter-war debates that were taking place in the philosophy of science (notably logical positivism), debates which coincided precisely in time and place with his development of the twelve-tone system.⁵⁶⁴

At least one music scholar has attempted to situate Schoenberg's thought within the lineage of Hegelian Idealism.⁵⁶⁵ Given the positivistic aspects I have identified in Schoenberg's outlook, especially his very marked insistence upon a fact-based and anti-metaphysical discourse, I regard this as a wholly wrongminded approach. Furthermore, Schoenberg never cites Hegel, and nothing by Hegel could be found in his personal library.⁵⁶⁶ He also adamantly condemned theorists who founded their conception of harmonic tonality upon universal dialectical modes of thought (Riemann and Hauptmann, for example).⁵⁶⁷ Finally, while remnants of dialectical metaphysics were undoubtedly still circulating in Schoenberg's Vienna, the worldview it presupposed was rapidly fading out of fashion. Thinkers who began to set new coordinates for the next century – such

⁵⁶⁵ See Cherlin, "Dialectical Opposition."

⁵⁶⁶ See fn. 187, above, citing White's inventory of the philosophical contents of Schoenberg's personal library.

University of California Press, 1993) ; James M. Baker, "The Limits of Tonality in the Late Music of Franz Liszt," *Journal of Music Theory*, 34/2 (1990): 145-74.

⁵⁶⁴ See fn. 229, above, relating "the revolution of 1924-25" (Schoenberg's) to "the revolution of 1925-26" (Einstein's).

⁵⁶⁷ Schoenberg frequently casts aspersions in Riemann's direction. "Mr. Riemann," Schoenberg writes, "doubts everything his particular old hat will not fit" (*Style and Idea*, 297). He also makes reference to "Riemann's kind of nonsense" (*Style and Idea*, 347). The difference of outlook between Schoenberg and Hauptmann can be seen by examining their contrary views on the question of the necessity of tonality (see p. 44, above).

as Nietzsche, Sartre, Russell, Wittgenstein, the logical positivists, Kafka, indeed Schoenberg himself – were intensely interested in abolishing the brand of metaphysics that had dominated the previous century.

I have argued that Schoenberg's positivist outlook is also manifest in his belief in the power and permanence of the dictates of nature. This assertion may run contrary to a common conception of Schoenberg as the theorist who first declared open war on nature. I have argued that Schoenberg was indeed adamantly opposed to *aesthetic* universalism, but not to universalism concerning established facts related to musical materials, perception, and cognition.

A number of general conclusions can be derived from the discussion of formalism in chapter 4. Wittgenstein's cautionary remarks concerning abstract: set-theoretical modes of mathematical modeling warrant greater attention from music theorists. Wittgenstein asserts that since the formalistic aspects of mathematics are easily concealed from view, widespread misunderstandings cf the importance and role of mathematical propositions have resulted.⁵⁶⁸ In order to use mathematics properly, Wittgenstein urges, we must never stop looking at its uses and applications, at the non-abstract aspects of mathematical reasoning, and at the relationship between mathematical and experiential propositions.⁵⁶⁹ We must learn to "civilize" mathematics, to keep it faithful to its origins, to keep

⁵⁶⁸ Diamond, "Wittgenstein, Mathematics, and Ethics," 240.
⁵⁶⁹ Ibid., 239.

it "in the service of the empirical."⁵⁷⁰ Further, it is hoped that the exercise of contextualizing Schoenberg's conception of musical formalism – attempting to understand it in relation to other, more over-arching developments in intellectual history such as logical positivism and conventionalism – will help to explain the broad reception, dissemination, and prestige that his music and ideas (and those of his followers) have enjoyed within the academy and the broader intellectual community, while at the same time they have had a less enthusiastic reception from the listening public.⁵⁷¹ In the end, the impact of modernist formalism, however powerful it may have been during much of the twentieth century, has ultimately been a transitory one in the larger historical context, just as many of the tenets espoused by the early Wittgenstein and by the Vienna Circle logical positivists are no longer the dominant ones in philosophy and epistemology.

There are also a number of very *practical* conclusions that can be drawn from this study. Perhaps we should heed the wisdom of Schoenberg and Wittgenstein and conclude that pointing out facts and making comparisons, rather than pronouncing judgments on them, is the only epistemologically-legitimate path that theorists of art and music can follow. Perhaps we should also weigh the relative merits of theories that describe compositional *activity* versus theories that proceed by applying *a priori* concepts and post-compositional systems of analysis. When we

⁵⁷¹ Botstein, "Schoenberg and the Audience."

⁵⁷⁰ Remarks on the Foundations of Mathematics, 237.

theorize about art we need to be wary of a tendency of the mind to create circular and vacuous theorisms (tautological propositions bearing no necessary relation to the world), to glorify solipsism, or to abuse propositional language altogether (by theorizing from metaphysical foundations, for example). Even Benjamin Boretz – a theorist who has shown a predilection for abstract theoretical formalism – has recently adopted the position that art must first and foremost be an "activity," a *praxis*, rather than an object of theoretical discussion.⁵⁷²

Michael Dummett provides an apt account of the kind of association of ideas that I have described in this dissertation:

The history of ideas is full of developments that cannot be explained by historical inquiries of the usual sort. Someone advances a new idea and supports it with certain arguments; only a short time later someone else puts forward the very same idea, supporting it with very similar arguments: and yet it appears that he had had no opportunity to read the work of the one who anticipated him. . . . Ideas, as it is said, are "in the air." The true explanation is presumably that, at a certain stage in the history of any subject, ideas become visible, though only to those with keen mental eyesight, ideas that even those with the sharpest vision could not have perceived at an earlier stage.⁵⁷³

In short, the fact that Schoenberg apparently never read, discussed, nor in any way explicitly addressed Wittgenstein's *Tractatus* does nothing to invalidate the comparison of ideas that I have undertaken. "Perhaps this book will be understood," Wittgenstein writes in the opening paragraph of his preface, "only by someone who has himself already had the thoughts that are expressed in it, or

⁵⁷² Maus, "Recent Ideas and Activities," 214–15.

⁵⁷³ Dummett, Origins of Analytical Philosophy, 2–3.

at least similar thoughts."⁵⁷⁴ I have argued that Arnold Schoenberg, Wittgenstein's compatriot and co-revolutionary, had very similar thoughts indeed.

⁵⁷⁴ *Tractatus Logico-Philosophicus*, 3 (preface).

Bibliography

Abelson, Peter. "Schopenhauer and Buddhism." *Philosophy East and West*, 43/2 (April, 1993): 255–78.

Adler, Guido. "Style Criticism [Der Stil in der Music, 1911]." The Musical Quarterly, 20 (1934): 172–76.

für Musikwissenschaft, 1 (1885), 5-20.

Agawu, Kofi. "Analyzing Music Under the New Musicological Regime." *Journal* of Musicology, 15 (1997): 297–307

Alber, Martin. *Wittgenstein und die Musik*. Innsbruck: Hayman, 2000.

Anderson, Andrew. "Why is Schoenberg's Seventeenth Chapter so Hard to Digest?" *Indiana Theory Review*, 15/2 (Fall, 1994): 1–16.

Angeles, Peter A. *Dictionary of Philosophy*. New York: Barnes and Noble, 1981.

Arnheim, Rudolf. Art and Visual Perception. Berkeley and Los Angeles: University of California Press, 1965.

. Visual Thinking. Berkeley and Los Angeles: University of California Press, 1969

Åqvist, Lennart. "Music from a Set-Theoretical Point of View." *Interface*, 2 (1973): 1–22.

Aumann, R. J., and S. Hart, eds. *Handbook of Game Theory*. Amsterdam: North– Holland, 1994.

Ayer, Alfred J. Language, Truth and Logic. London: Gollancz, 1936.

Babbitt, Milton. "Moses and Aaron." In *Perspectives on Schoenberg and Stravinsky*, edited by Benjamin Boretz and Edward T. Cone. New York: W.W. Norton, 1972.

———. "Past and Present Concepts of the Nature and Limits of Music." In *Perspectives on Contemporary Music Theory*, edited by Benjamin Boretz and Edward T. Cone. New York: Norton, 1972.

. "A Response: Milton Babbitt." *Perspectives of New Music*, 35/2 (1997): 129–36.

------. "The Structure and Function of Music Theory." In *Perspectives on Contemporary Music Theory*, edited by Benjamin Boretz and Edward T. Cone. New York: Norton, 1972.

———. Words About Music. Edited by Stephen Dembski and Joseph N. Straus. Madison, Wisconsin: University of Wisconsin Press, 1987.

Baker, Gordon. Wittgenstein, Frege and the Vienna Circle. Oxford: Blackwell, 1983.

- Baker, James M. "The Limits of Tonality in the Late Music of Franz Liszt." *Journal* of Music Theory, 34/2 (1990): 145–74.
- Bakhtin, Mikhail M. *The Dialogic Imagination*. Edited by Michael Holquist, trans. Caryl Emerson and Michael. Austin: Holquist, 1981.
- Barker, Peter. "Hertz and Wittgenstein." *Studies in History of the Physical Sciences*, 11 (1980): 243-256.
- Bartford, Philip. "Music in the Philosophy of Schopenhauer," *Soundings*, 5 (1975): 29–43.

Bateson, G. Mind and Nature: A Necessary Unity. New York: Bantam, 1988.

- Bauer, K. *Adorno's Nietzschean Narratives*. Albany: State University of New York Press, 1999.
- Bayley, J. E. *Aspects of Relativism*. Lanham, Md.: University Press of America, 1992.
- Benjamin, William. "Review of *The Structure of Atonal Music* by Allen Forte." *Perspectives of New Music*, 13/1 (Fall-Winter, 1974): 170–90.
- Bent, Margaret. "Fact and Value in Contemporary Music Scholarship." In Fact and Value in Contemporary Music Scholarship, transcripts from CMS proceedings, November 8, 1985, Vancouver, B.C. Boulder, Colorado: College Music Society, 1986.
- Bentley, Arthur F. *Linguistic Analysis of Mathematics*. Bloomington, Indiana: Principia Press, 1932.

Bergland, R. The Fabric of Mind. New York, 1985.

Berlin, Isaiah. The Magus of the North: Johann Georg Hamann and the Origins of Modern Irrationalism. New York: Farrar, 1993.

—. *The Sense of Reality*. London: Chatto and Windus, 1996.

Bernstein, David. "George Capellen's Theory of Reduction: Radical Harmonic Theory at the Turn of the Twentieth Century." *Journal of Music Theory*, 37 (1993): 85–116.

- Bernstein, R. J. *Beyond Objectivism and Relativism*. Philadelphia: University of Pennsylvania Press, 1983.
- Berry, Donald K. Forms of Life and Following Rules: A Wittgensteinian Defense of Relativism. New York: E. J. Brill, 1996.
- Berry, Wallace. "Sense and Sensibility: What Can We Know about Music? (What do We Want to Know?)." In *Fact and Value in Contemporary Music Scholarship*, transcripts from CMS proceedings, November 8, 1985, Vancouver, B.C. Bou der, Colorado: College Music Society, 1986.
- Best, Stephen, and Douglas Kellner, *Postmodern Theory: Critical Interrogations*. New York: Guilford Press, 1991.

Black, Max. A Companion to Wittgenstein's Tractatus. Ithaca: Cornell University Press, 1970.

Blasius, Leslie D. *Schenker's Argument and the Claims of Music Theory*. Cambridge: Cambridge University Press, 1996.

Boretz, Benjamin. "Meta-Variations: Studies in the Foundations of Music Thought." Ph.D. Dissertation, Princeton University, 1970.

. "Meta-Variations III: The Construction of Musical Syntax I." *Perspectives* of New Music, 9/1(1970): 23–42.

. "Meta-Variations IV: Analytic Fallout II." *Perspectives of New Music*, 11/2 (1973): 156–203.

- Boretz, Benjamin, and Edward T. Cone, eds., *Perspectives on Contemporary Music Theory*. New York: Norton, 1972.
- Boretz, Benjamin, and James K. Randall. *Meta-Variations/Compose Yourself*. Red Hook, N.Y.: Open Space, 1995.

Boss, Jack. "Schoenberg's Opus 22 Radio Talk and Developing Variations in Atonal Music." *Music Theory Spectrum*, 14/2 (1992): 125–49.

Botstein, Leon. "Cinderella; or Music and the Human Sciences: Unfootnoted Musings from the Margins." *Current Musicology*, 53 (1993): 132.

- Boulez, Pierre. "The Composer and Creativity." *Journal of the Arnold Schoenberg Institute*, 11/2 (June, 1988): 108–122.
- . "Through Schoenberg to the Future." *Journal of the Arnold Schoenberg Institute*, 1/3 (June, 1977): 121–125.
- Bramann, Jorn K. *Wittgenstein's Tractatus and the Modern Arts*. Rochester, New York: Adler, Publishing, 1985.

Bramann, Jorn K., and John Moran. "Karl Wittgenstein: Business Tycoon and Art Patron." Austrian History Yearbook, 15–16 (1979–80): 107–27.

- Brand, J., and C. Hailey, eds. *Constructive Dissonance: Arnold Schoenberg and the Transformations of Twentieth-Century Culture*. Berkeley and Los Angeles: University of California Press, 1997.
- Bregman, Albert S. Auditory Scene Analysis: The Perceptual Organization of Sound. Cambridge, Massachusetts: M.I.T. Press, 1991.
- Brouwer, Luitzan E. J. "*Mathematik, Wissenschaft und Sprache.*" Reprinted in L. E. J. Brouwer, *Collected Works*. Vol. 1. Edited by A. Heyting. Amsterdam: North Holland, 1975.
- Brown, Matthew. "Adrift on Neurath's Boat: The Case for a Naturalized Music Theory." *Music Theory Online*, 2.2 (1996).
- Brown, Matthew, and Douglas Dempster. "The Scientific Image of Music Theory." *Journal of Music Theory*, 33/1 (1989): 65–106.
- Brown, Harold. "Review of *Style and Idea* by Arnold Schoenberg." *The Nation*, July 8, 1950, 43.
- Bunge, Mario. "Analyticity Redefined." Mind, 70/278 (April, 1961): 239-45.
- Busoni, Ferruccio. "Sketches of a New Esthetic of Music [1911]." In *Three Classics in the Aesthetics of Music*. New York: Dover, 1962, 75–102.
- Cacciari, Massimo. *Posthumous People: Vienna at the Turning Point*. Palo Alto, California: Stanford University Press, 1979.
- Cage, John. Charles Eliot Norton Lectures I-VI. Cambridge: Harvard University Press, 1990.
- Canfield, John V., ed. Wittgenstein: Aesthetics, Ethics and Religion. Vol. 4 of The Philosophy of Wittgenstein. New York: Garland, 1986.
- Carnap, Rudolf. "The Elimination of Metaphysics through Logical Analysis of Language." In *Logical Positivism*, edited by A. J. Ayer. New York: The Free Press, 1959.
 - . "Intellectual Autobiography." In *The Philosophy of Rudolf Carnap*, edited by Paul A. Schlipp. LaSalle, Ill.: Open Court, 1964, 3–84.

. The Logical Structure of the World and Pseudo-Problems in Philosophy [Der Logische Aufbau der Welt, 1928]. Translated by R. George. Berkeley and Los Angeles: University of California Press, 1967.

Translated by Amethe Smeaton. London: Routledge, 1949.
. "Observation Language and Theoretical Language [*Beobachtungsprache und theoretische Sprache*, 1958]." In *Rudolf Carnap, Logical Empiricist*. Dortrecht, Holland: D. Reidel, 1975.

------. "Testability and Meaning (I)." Philosophy of Science, 3 (1936), 419–71.

------. "Testability and Meaning (II)." *Philosophy of Science*, 4 (1937), 2–40.

Carr, H. W. A Theory of Monads: Outlines of the Philosophy of the Principle of Relativity. London: MacMillan, 1922.

Castine, Peter. Set Theory Objects: Abstractions for Computer-Aided Analysis and Composition of Serial and Atonal Music. Frankfurt am Main: Peter Lang, 1994.

Cazden, Norman. "Musical Consonance and Dissonance: A Cultural Criterion." Journal of Aesthetics and Art Criticism, 6/1 (1945): 3–11.

Cherlin, Michael. "Dialectical Opposition in Schoenberg's Music and Thought." *Music Theory Spectrum*, 22/2 (Fall, 2000): 157–76.

Journal of the Arnold Schoenberg Institute, 9/2 (November, 1986): 210–17.

Chew, Geoffrey. "Music as Psychic Motion and Tristan and Isolde: Toward a Model for Analyzing Musical Instability." *Music Analysis*, 10 (1991): 171–93.

Chion, Michel. *Guide des objets sonores*. Paris: Buchet/Chastel, 1983.

Chisholm, R. "The Myth of the Given." In *Epistemology: The Big Questions*, edited by Linda M. Alcoff. Oxford: Blackwell, 1998.

Christensen, Thomas. "Eighteenth-Century Science and the *Corps Sonore*: The Scientific Background to Rameau's Principle of Harmony." *Journal of Music Theory* 31/1 (1987): 23–30.

Clough, John. "PC Set Equivalence and Inclusion: A Comment on Forte's Theory of Set Complexes." *Journal of Music Theory*, 9 (1965): 163–71.

Cohn, Richard. "Neo-Riemannian Operations, Parsimonious Trichords, and their *Tonnetz* Representations." *Journal of Music Theory*, 41 (1997): 1–66.

Coleridge, Samuel Taylor. Biographia Literaria. London: Dent, 1906.

- Coleman, Francis. "A Critical Examination of Wittgenstein's Aesthetics." American Philosophical Quarterly, 25/4 (October, 1968): 257–34.
- Comte, Auguste. *The Positive Philosophy* [*Cours de philosophie positive*, 6 vols., 1830–42]. Translated by Harriet Martineau. New York: Calvin Blanchard, 1855.
- Conant, James. "Must We Show What We Cannot Say?" In *The Senses of Stanley Cavell*, edited by R. Fleming and M. Payne. Lewisbury, Penn.: Bucknell University Press, 1989.
- Cone, Edward T. "Beyond Analysis." Perspectives of New Music, 6/1 (Fall-Winter, 1967): 33–51. Reprinted in Music: A View from Delft, edited by R. P. Morgan. Chicago: University of Chicago Press, 1989.

Connor, S. Postmodernist Culture: An Introduction to Theories of the Contemporary. Cambridge, Mass.: Blackwell, 1989.

Cook, Nicholas. "Music Theory and 'Good Comparison': A Viennese Perspective." *Journal of Music Theory*, 33/1 (Spring, 1989): 117–42.

- Cook, Nicholas, and Mark Everist, eds. *Rethinking Music*. Oxford: Oxford University Press, 1998.
- Corrado, Michael. *The Analytic Tradition in Philosophy: Background and Issues*. Chicago: American Library Association, 1975.

Covach, John. "Schoenberg and the Occult: Some Reflections on the Musical Idea." *Theory and Practice*, 17 (1992): 103–18.

————. "Schoenberg's Turn to an 'Other' World." Music Theory Online, 1.5 (1995).

Covington, Kate, and Charles H. Lord. "Epistemology and Procedure in Aural Training: In Search of a Unification of Music Cognitive Theory and Its Application." *Music Theory Spectrum*, 16/2 (1994): 159–70.

Craige, B. J. *Relativism in the Arts*. Athens: University of Georgia Press, 1983.

Croce, Benedetto. *Aesthetics as the Science of Expression and General Linguistics* [1902]. 2nd ed. Translated by Douglas Ainsle. London: MacMillan and Co., 1922.

Cross, Charlotte. "Three Levels of 'Idea' in Schoenberg's Thought and Writings." *Current Musicology*, 30 (1980): 24–36.

Dahlhaus, Carl. *Analysis and Value Judgment*. Translated by Siegmund Levarie. Stuyvesant, N.Y.: Pendragon Press, 1983.

. "A Rejection of Material Thinking." In *Schoenberg and the New Music: Essays by Carl Dahlhaus*, edited and translated by Derrick Puffett and Alfred Clayton. Cambridge: Cambridge University Press, 1987.

Gjerdingen. Princeton: Princeton University Press, 1990.

Dauben, J. "The Origins of Georg Cantor's Theory of Sets." Rete, 2 (1974): 104–34.

Dauer, Dorothea. Schopenhauer as Transmitter of Buddhist Ideas. Berne: Lang, 1969.

- Davis, James A. "Positivistic Philosophy and the Foundations of Atonal Music Theory." Ph.D. Dissertation, Boston University, 1993.
- Dempster, Douglas, and Matthew Brown. "Evaluating Musical Analysis and Theories: Five Perspectives." *Journal of Music Theory*, 34/2 (1990): 247–80.
- Dennett, Daniel. "Ludwig Wittgenstein." In People of the Century: One Hundred Men and Women Who Shaped the Last One Hundred Years. New York: Simon & Schuster, 1999. 145–150.
- Devine, P. E. *Relativism, Nihilism, and God.* Notre Dame: University of Notre Dame Press, 1989.
- Diamond, Cora. *The Realistic Spirit: Wittgenstein, Philosophy and the Mind.* Cambridge: M.I.T. Press, 1991.

. "Wittgenstein, Mathematics, and Ethics: Resisting the Attractions of Realism." In *The Cambridge Companion to Wittgenstein*, edited by Hans D. Sluga and David G. Stern. Cambridge: Cambridge University Press, 1996.

- Diels, Hermann. Ancilla to the Pre-Socratic Philosophers: A Complete Translation of the Fragments in Diels' Fragmente der Vorsokratiker, Translated by Kathleen Freeman. Oxford: Blackwell, 1948.
- Dilthey, Wilhelm. *Introduction to the Human Sciences* [*Einleitung in die Geistwissenschaften*, 1883]. Edited and translated by R. A. Makkreel and F. Rodi. Princeton: Princeton University Press, 1989.
- Dineen, Murray. "Problems of Tonality: Schoenberg and the Concept of Tonal Expression." Ph.D. Dissertation, Columbia University, 1988.
- Dreben, B., and J. Floyd. "Tautology: How Not to Use a Word." *Synthèse*, 87/1 (1991): 23–50.
- Drury, M. O'C. "Ludwig Wittgenstein Symposium (II): Assessments of the Man and the Philosopher." *The Listener*, 63 (January 28, 1960): 163–65.

- Dubiel, Joseph. Dubiel, Joseph. "Hearing, Remembering, Cold Storage, Purism, Evidence, and Attitude Adjustment." *Current Musicology*, 60-61 (1996): 26-50.
 - . "What's the Use of the Twelve-Tone System." *Perspectives of New Music*, 35/2 (1997): 33–51.

Dummett, Michael. Origins of Analytical Philosophy. London: Duckworth, 1993.

Dunsby, Jonathan. "Schoenberg and the Writings of Schenker." *Journal of the Arnold Schoenberg Institute*, 4/1 (October, 1977): 26–33.

Eagleton, Terry. Saints and Scholars. London: Verso, 1987.

. "Wittgenstein as Philosophical Postmodernist." In *Wittgenstein: Philosophy, Postmoderism, Pedagogy,* edited by Michael Peters and James Marshall. Westport, Conn.: Bergin and Garvey, 1999, 70–105.

Ebbs, Gary. *Rule-Following and Realism.* Cambridge: Harvard University Press, 1997.

- Edmonds, David and John Eidinow. *Wittgenstein's Poker*. London: Faber and Faber, 2001.
- Edwards, S. D. *Relativism, Conceptual Schemes and Categorial Frameworks*. Brookfield, Vt.: Gower, 1990.
- Einstein, Albert. *The Principles of Relativity: A Collection of Original Memoirs on the Special and General Theory of Relativity* [Das Relativitatsprinzip, 1922]. Translated by Hendrik A. Lorentz. New York: Dover, 1952.
- Engelmann, Paul. Letters from Ludwig Wittgenstein, with a Memoir. Edited by Brian F. McGuinness. Oxford: Blackwell, 1969.
- Ennulat, Egbert M., ed. and trans. Arnold Schoenberg Correspondence: A Collection of Translated and Annotated Letters Exchanged with Guido Adler, Pablo Casals, Emmanuel Feuermann and Olin Downes. Blue Ridge Summit, Penn.: Scarecrow Press, 1991.
- Erwin Charlotte E., and Bryan R. Simms. "Schoenberg's Correspondence with Heinrich Schenker." *Journal of the Arnold Schoenberg Institute*, 5/1 (June 1981): 23–43.
- Etzion, Judith, and Susana Weich-Shahak. "'Family Resemblances' and Variability in the Sephardic Romancero: A Methodological Approach to Variational Comparison." *Journal of Music Theory*, 37/2 (Fall 1993): 267–310.
- Flindell, E. Fred. "Paul Wittgenstein (1887-1961): Patron and Pianist." *The Music Review*, 32 (1971), 107-27.
- Forte, Allen. "Schoenberg's Creative Evolution: The Path to Atonality." *Musical Quarterly*, 64/2 (April, 1978): 133–76.

------. The Structure of Atonal Music. New Haven: Yale University Press, 1977.

Frank, P. Relativity, a Richer Truth. London: Cape, 1951.

Frege, Gottlob. "Begriffschrift, a Formula Language, Modeled upon that of Arithmetic, for Pure Thought [1879]." In From Frege to Gödel: A Source Book in Mathematical Logic, 1879-1931, edited by J. van Heijenoort and translated by S. Bauer-Mengelberg. Cambridge: Harvard University Press, 1967.

Fretlöh, Sigfrid. Relativismus versus Universalismus. Aachen: Alano-Verlag, 1989.

Friedmann, Michael L. *Ear-Training for Twentieth-Century Music*. New Haven: Yale University Press, 1990.

Frisch, Walter. *Brahms and the Principle of Developing Variation*. Berkeley and Los Angeles: University of California Press, 1984.

————, ed. *Schoenberg and His World*. Princeton: Princeton University Press, 1999.

Gablik, Suzi. Progress in Art. New York: Rozzoli, 1977.

Galand, Joel. "The Turn from the Aesthetic." Current Musicology, 58 (1995): 79–97.

Galison, Peter. "Aufbau/Bauhaus: Logical Positivism and Architectural Modernism," *Critical Inquiry*, 16 (Summer, 1990): 709–52.

Garavaso, Pieranna. "Anti-Realism and Objectivity in Wittgenstein's Philosophy of Mathematics." *Philosophica*, 48 (1991/92): 93–106.

. "Wittgenstein's Philosophy of Mathematics: A Reply to Two Objections." *Southern Journal of Philosophy*, 26 (1988): 179–91.

- Gargani, Aldo. "Techniques descriptives et procédures constructives: Schoenberg-Wittgenstein." In *Ludwig Wittgenstein*, edited by Jean-Pierre Cometti. Marseille: Sud-Revue Littéraire (hors série), 1986, 74–121.
- Gay, Peter. Freud, Jews and Other Germans: Masters and Victims in Modernist Culture. New York: Oxford University Press, 1978.

- Gibbs, Jason. "Review of *Words about Music* by Milton Babbitt." *In Theory Only*, 10/8 (1988): 16–25.
- Gifford, N. L. *When in Rome: Relativism and Knowledge*. Albany: State University of New York Press, 1983.

Glock, Hans-Johann. A Wittgenstein Dictionary. Oxford: Blackwell, 1996.

———. "Kant and Wittgenstein: Philosophy, Necessity and Representation," *International Journal of Philosophical Studies*, 5 (1997): 285-305.

------. "Wittgenstein and Reason." In *Wittgenstein: Biography and Philosophy*, edited by James C. Klagge. Cambridge: Cambridge University Press, 2001, 195-220.

Goehr, Alexander. "Schoenberg and Karl Kraus: The Idea Behind the Music." *Music Analysis*, 4/1-2 (1985): 59–71.

Goethe, Johann Wolfgang von. *Faust* [1808]. Translated by David Luke. Oxford: Oxford University Press, 1987.

Goldstein, Bluma. *Reinscribing Moses: Heine, Kafka, Schoenberg in a European Wilderness*. Cambridge: Harvard University Press, 1992.

Goodman, Nelson. "Reply to Benjamin Boretz." *Journal of Philosophy*, 67/16 (August, 1970): 566–69.

. Ways of Worldmaking. Indianapolis, Indiana: Hackett, 1978.

Grube, G. M. A. Plato's Thought. Boston: Beacon Press, 1958.

Guck, Marion. "Music Loving, or the Relationship with the Musical Work." *Music Theory Online*, 2.2 (1996).

- Gut, Serge. "Les bases théoriques de l'organisation des sons chez Hindemith." In *Hommage à Paul Hindemith: l'homme et l'oeuvre*. Edited by Andres Briner, et *e*l. Yverdon: Éditions de la Revue Musicale de Suisse Romande, 1973.
- Haase, Robert. *Paul Hindemiths Harmonikale Quellen sein Briefwechsel mit Hans Kayser*. Vienna: Hans-Kayser-Institut für harmonikale Grundlagenforschung an der Hochschule für Musik und darstellende Kunst, 1973.
- Hahl-Koch, Jalina, ed. Arnold Schoenberg Vassily Kandinsky: Letters, Pictures and Documents. Translated by John C. Crawford. London: Faber and Faber, 1984.
- Hahn, Hans. Empiricism, Logic and Mathematics [Logik, Mathematik und Naturerkennen, 1925]. Edited and translated by Brian McGuiness. Dordrecht, Holland: Reidel, 1980.

edited by A. J. Ayer, translated by David Rynin. New York: Free Press, 1959.

- Hahn, Hans, Otto Neurath, and Rudolf Carnap. "The Scientific Conception of the World [Wissenschaftliche Weltauffassung: Der Wiener Kreis, 1929]." In Empiricism and Sociology, translated by Paul Foulkes and Marie Neurath. Dordrecht, Holland: Reidel, 1973.
- Hailey, Christopher. "Musical Expressionism: The Search for Autonomy." In *Expressionism Reassessed*, edited by Shulamith Behr, David Fanning and Douglas Jarman. Manchester: Manchester University Press, 1993.
- Haimo, Ethan. "Developing Variations and Schoenberg's Serial Music." *Music Analysis*, 16/3 (October, 1997): 349–65.

- Haller, Rudolf. "New Light on the Vienna Circle." *The Monist*, 65 (January, 1982), 25–37.
- Hamann, Johann Georg. *Socratic Memorobilia*. Translated by James C. O'Flaherty. Baltimore: Johns Hopkins Press, 1967.
- Hanslick, Eduard. On the Musically Beautiful: A Contribution Towards the Revision of the Aesthetics of Music [Vom Musikalisch-Schönen: ein Beitrag zur Revision der Ästhetik der Tonkunst, 1854]. Edited and translated by Geoffrey Payzant. Indianapolis: Hackett, 1986.
- Harrison, Thomas. 1910: The Emancipation of Dissonance. Los Angeles: University of California Press, 1996.

- Hauptmann, Moritz. *The Nature of Harmony and Metre* [*Die Natur der Harmonik und der Metrik*, 1853]. Translated by W. E. Heathcote. New York: Da Capo, 1991.
- Heal, Jane. *Fact and Meaning: Quine and Wittgenstein on Philosophy of Language*. Oxford: Blackwell, 1989.
- Heaton, John, and Judy Groves. *Introducing Wittgenstein*. Cambridge: Icon Books, 1999.
- Heller, Erich. "Ludwig Wittgenstein Symposium (I): Assessments of the Man and the Philosopher." *The Listener*, 63 (January 28, 1960): 163.
- Helmholtz, Hermann. On the Sensations of Tone [Die Lehre von den Tonempfindungen, 1863]. Translated by Alexander J. Ellis. New York: Dover, 1954.
- Hempel, Carl G. "The Empiricist Criterion of Meaning." In *Logical Positivism*, edited by Alfred J. Ayer. New York: The Free Press, 1959.

. "Geometry and Empirical Science." In *Our Mathematical Heritage: Essays on the Nature and Cultural Significance of Mathematics,* edited by W. L. Schaaf. New York: Collier, 1963.

Hilbert, David. *Foundations of Geometry* [*Grundlagen der Geometrie*, 1899]. Translated by Leo Unger. Lasalle, Ill.: Open Court, 1971.

. "On the Infinite [Über die Einheit, Allgemeinheit, und Unendlichkeit der *Vernunft*]." In *From Frege to Gödel: A Source Book in Mathematical Logic, 1879-* 1931, edited by J. van Heijenoort and translated by S. Bauer-Mengelberg. Cambridge: Harvard University Press, 1967.

Hindemith, Paul. The Craft of Musical Composition. Melville, N.Y.: Belwin-Mills, 1942.

Hintikka, J. "Ludwig's Apple Tree: On the Philosophical Relations between Wittgenstein and the Vienna Circle." In *Scientific Philosophy: Origins and Developments*, edited by Friedrich Stadler. Dordrecht, Holland: Kluwer, 1993.

- Hsu, Dolores. "Ernst Kurth and His Concept of Music as Psychic Motion." *Journal* of Music Theory, 10 (1966): 2–17.
- Hume, David. A *Treatise of Human Nature* [1740]. Edited by D. G. C. MacNabb. London: Collins, 1962.
- Huron, David. "The Contra-Tonal Structure of Schoenberg's Twelve-Tone Rows." Poster presentation, Annual Meeting of the Society for Music Theory, Toronto, November, 2000.

------. "The Enigma of Musical Progress." M.A. Thesis, York University, 1987.

. "Voice Denumerability in Polyphonic Music of Homogeneous Timbres." *Music Perception*, 6/4 (1989): 361–82.

Hyde, Martha. "Neo-Classic and Anachronistic Impulses in Twentieth-Century Music." *Music Theory Spectrum*, 18 (1996): 200–35.

Janik, Allan S. "Schopenhauer and the Early Wittgenstein." Chap. 2 in *Essays on Wittgenstein and Weininger*. Amsterdam: Rodopi, 1985.

———— . Wittgenstein in Vienna: A Biographical Excursion Through the City and Its History. Vienna: Springer, 1998.

—. Wittgenstein's Vienna Revisited. New Brunswick, N.J.: Transaction, 2001.

- Janik, Allan S., and Stephen E. Toulmin. *Wittgenstein's Vienna*. New York: Simon & Schuster, 1973.
- Jeppesen, Knud. *The Style of Palestrina and the Dissonance* [*Die Dissonanzbehandlung bei Palestrina*, 1922]. Translated by Ejnar Munksgaard. New York: Dover, 1970.

Johnson, Philip E. A *History of Set Theory*. Boston: Prindle, Weber and Schmidt, 1972.

- Johnston, William M. *The Austrian Mind: An Intellectual and Social History*, 1848-1938. Berkeley and Los Angeles: University of California Press, 1972.
- Jorgenson, Dale. "A Résumé of Harmonic Dualism." *Music and Letters*, 44/1 (1963): 31–42.

Kallir, Jane. Arnold Schoenberg's Vienna. New York: Gallery St. Étienne, 1984.

Kandinsky, Vassily. *Concerning the Spiritual in Art [Über das Geistige in der Kunst,* 1912]. Translated by M. T. H. Sadler. New York: Dover, 1977.

. "Foreword to the Catalogue of the Second Exhibition of the Neue Künstler-Vereinigung Munich (1910)." In *Complete Writings on Art*, edited by Kenneth C. Lindsay and Peter Vergo. New York: Da Capo Press, 1994.

Kant, Immanuel. *Critique of Pure Reason* [*Kritik der reinen Vernunft*, 1781]. Translated by Paul Geyer. Cambridge: University Press, 1998.

Kassler, Jamie C. "Apollo and Dionysos: Music Theory and the Western Tradition of Epistemology." In *Music and Civilization: Essays in Honor of Paul Henry Lang*, edited by Edmond Strainchamps, Maria R. Maniates, and Christopher Hatch. New York: Norton, 1984.

. "Heinrich Schenker's Epistemology and Philosophy of Music: An Essay on the Relations between Evolutionary Theory and Music Theory." In *The Wider Domain of Evolutionary Thought*, edited by D. Oldroyd and I. Langham. Dordrecht, Holland: Reidel, 1983.

Kassler, Michael. "A Sketch of the Use of Formalized Languages for the Assertion of Music." *Perspectives of New Music*, 1/2 (Spring, 1963): 83–94.

Keller, Hans. "Moses, Freud and Schoenberg." *Monthly Musical Review*, 88 (1958): 1–70.

Kenny, Anthony. "Wittgenstein on the Nature of Philosophy." In *Wittgenstein and His Times*, edited by Brian F. McGuiness. Oxford: Blackwell, 1982.

Kerman, Joseph. *Contemplating Music*. Cambridge: Harvard University Press, 1985.

———, ed. *Music at the Turn of the Century:* A 19th-Century Music Reader. Berkeley and Los Angeles: University of California Press, 1990.

Keiler, Allan. "Music as Metalanguage: Rameau's Fundamental Bass," in *Music Theory: Special Topics*, ed. Richmond Browne. New York: Academic Press, 1981.

Kierkegaard Sören. Purity of Heart. New York: Fontana Books, 1961.

- Kintzler, Catherine. "Rameau et d'Alembert: modèle mathématique et modèle expérimental." Annexe I in *Jean-Philippe Rameau: Splendeur et naufrage de l'esthétique du plaisir à l'âge classique*. Paris: Minerve, 1988.
- Kirnberger, Johann Philipp. *The Art of Strict Musical Composition* [*Die Kunst des reinen Satzes in der Musik*, 1779]. Edited and translated by David Beach and Jurgen Thym. New Haven: Yale Press, 1982.

Kitcher, P. "Hilbert's Epistemology." Philosophy of Science, 43 (1976): 99-115.

- Klagge, James C., ed. *Wittgenstein: Biography and Philosophy*. Cambridge: Cambridge University Press, 2001.
- Klenk, V. H. Wittgenstein's Philosophy of Mathematics. The Hague: Mainus Nighoff, 1966.
- Knight, Lovina May. "Classes with Schoenberg." *Journal of the Arnold Schoenberg Institute*, 13/2 (November, 1990): 137–63.

Koestler, Arthur. *The Creative Act.* New York: Dell Books, 1967.

Korsmeyer, C., ed. Aesthetics: The Big Questions. Oxford: Blackwell, 1998.

Kosuth, Joseph. *Art After Philosophy and After: Collected Writings, 1966-1990.* Cambridge: M.I.T. Press, 1991.

. "Art After Philosophy: Part I." *Studio International*, 178/915 (October, 1969): 134–37.

. "Art After Philosophy: Part II." *Studio International*, 178/916 (November, 1969): 160–61.

- Kraft, Victor. *The Vienna Circle: The Origin of Neo-Positivism [Der Wiener Kreis: Der Ursprung des Neopositivismus, 1950]*. Translated by Arthur Pap. New York: Philosophical Library, 1953.
- Kraft, Werner. "Ludwig Wittgenstein und Karl Kraus: Direkt und Indirect." In *Untersuchungen zum Brenner*, edited by Walther Methagl, et al. Salzburg: Muller, 1981.
- Kramer, Lawrence. *Classical Music and Postmodern Knowledge*. Berkeley and Los Angeles: University of California Press, 1995.

. "The Musicology of the Future." *Repercussions*, 1/1 (1992): 5–18.

- Kraus Joseph C. "Tonal Conflict and Resolution in Tchaikovsky's Symphony Number Five in E-Minor." *Music Theory Spectrum*, 13/1 (Spring, 1991), 21–47.
- Kreegan, Charles L. Wittgenstein and Kierkegaard: Religion, Individuality and *Philosophical Method*. London: Routledge, 1989.
- Krenek, Ernst. "Schoenberg the Centenarian." *Journal of the Arnold Schoenberg Institute*, 1/2 (February 1977), 87–91.
- Kropfinger, Klaus. "Latent Structural Power versus the Dissolution of Artistic Material in the Works of Kandinsky and Schoenberg." In Schoenberg and Kandinsky: An Historical Encounter, edited by Konrad Boehmer. Amsterdam: Harwood Academic Publishers, 1997.
- Krumhansl, Carol. "Music Psychology and Music Theory: Problems and Prospects." *Music Theory Spectrum*, 17/1 (1995): 53–90.

. "The Perception of Tone Hierarchies and Mirror Forms in Twelve-Tone Serial Music." *Music Perception*, 5/1 (1987): 31–77.

- Kuhn, Thomas. *The Structure of Scientific Revolutions*. 2nd ed. Chicago: University of Chicago Press, 1970.
- Kurth, Ernst. "Music as Psychic Motion." In *Ernst Kurth: Selected Writings*, edited and translated by Lee A. Rothfarb. Cambridge: Cambridge University Press, 1991.
- Kurtz, Michael. *Stockhausen: A Biography*. Translated by R. Toop. London: Faber & Faber, 1992.
- Langer, Susanne K. "A Set of Postulates for the Logical Structure of Music." *The Monist*, 39 (1929): 561–70.
- Lefkowitz, David S. "Listening Strategies and Hexachordal Combinatorial 'Functions' in Schoenberg's Op. 23, No. 4." *Music Analysis*, 16/3 (1997): 309-48.
- Lemoine, Roy E. *The Anagogic Theory of Wittgenstein's Tractatus*. Paris: Mouton, 1975.
- Lerdahl, Fred. "Atonal Prolongational Structure." Contemporary Music Review, 4 (1989): 65–87.

. "Cognitive Constraints on Compositional Systems." In *Generative Processes in Music: The Psychology of Performance, Improvisation, and Composition,* edited by John A. Sloboda. Oxford: Clarendon, 1988. Reprinted in *Contemporary Music Review*, 6/2 (1992): 97–122.

Lerdahl, Fred, and Ray Jackendoff. *A Generative Theory of Tonal Music*. Cambridge: M.I.T. Press, 1983.

Lessem, Alan. *Music and Text in the Works of Arnold Schoenberg: the Critical Years*, 1908-1922. Ann Arbor: U.M.I. Research Press, 1979.

. "Schoenberg and the Crisis of Expressionism." *Music and Letters*, 55/4 (1974): 429–36.

Lester, Joel. *Compositional Theory in the Eighteenth Century*. Cambridge: Harvard Press, 1992.

Lewin, David. *Generalized Musical Intervals and Transformations*. New Haven: Yale University Press, 1987.

. "Two Interesting Passages in Rameau's *Traité de l'harmonie.*" In Theory Only, 4/3 (1978): 3–11.

. "Moses und Aron: Some General Remarks, and Analytic Notes for Act 1, Scene 1." *Perspectives of New Music*, 6/1 (Fall-Winter 1967): 1–17. Reprinted in *Perspectives on Schoenberg and Stravinsky*. Edited by Benjamin Boretz and Edward T. Cone. New York: W.W. Norton, 1972, 61–77.

. "A Tutorial on Klumpenhouwer Networks, Using the Chorale in Schoenberg's Op. 11, No. 2." *Journal of Music Theory*, 38/1 (1994): 79–101.

Lewis, C. S. The Abolition of Man. Oxford: Oxford University Press, 1943.

Liepp, E. "Critique des fondements de la théorie de Jean-Philippe Rameau." *La revue musicale,* 260 (1965), 97–111.

- Lindberg, D. C., and R. S. Westman, eds. *Reappraisals of the Scientific Revolution*. Cambridge: Cambridge University Press, 1990.
- Lippius, Johannes. *Synopsis of New Music* [*Synopsis musicae novae omino verae atcue methodicae universae*, 1612]. Edited and translated by Benito V. Rivera. Colorado Springs: Colorado College Music Press, 1977.
- Lippman, E. "The Place of Aesthetics in Theoretical Treatises on Music." In *Music Theory and the Exploration of the Past*, edited by Christopher Hatch and Davic Bernstein. Chicago: University of Chicago Press, 1993.
- Lugg, Andrew. "Was Wittgenstein a Conservative Thinker?" *Southern Journal of Philosophy*, 23/4 (1985): 465-74.

Lukács, Georg. "Art and Objective Truth." In *Writer and Critic and Other Essays*, edited and translated by Arthur D. Kahn. New York: Grosset and Dunlap, 1970.

edited by David Lodge. London: Longman, 1955.

Lyotard, Jean-François. *The Differend*. Minneapolis: University of Minnesota Press, 1988.

______. The Postmodern Condition: A Report on Knowledge [La Condition postmoderne: rapport sur le savoir, 1979]. Translated by G. Bennington and B. Massumi. Minneapolis, Minnesota: University of Minnesota Press, 1984.

Mace, Cecil A. *The Principles of Logic: An Introductory Survey*. London: Longmans, 1933.

Malcolm, Norman. *Ludwig Wittgenstein: A Memoir*. Oxford: Oxford University Press, 1966.

Marion, Mathieu. "On the Philosophical Relation between Brouwer and Wittgenstein." Paper presented at the Boston Colloquium for Philosophy of Science, November, 2000.

———— . Wittgenstein, Finitism and the Foundation of Mathematics. Oxford: Clarendon Press, 1998.

Maslow, Alexander. *A Study of Wittgenstein's Tractatus*. Berkeley and Los Angeles: University of California Press, 1961.

Masters, R. D. Beyond Relativism. Hanover, N. H.: New England Press, 1993.

Maus, Fred Everett. "Humanism and Musical Experience." Ph.D. Dissertation, Princeton University, 1990.

———. "Recent Ideas and Activities of James K. Randall and Benjamin Boretz:
 A New Social Role for Music." *Perspectives of New Music*, 26/2 (Summer, 1988):
 214–22.

- McCredie, Andrew D. "Systematic Musicology: Some Twentieth-Century Patterns and Perspectives." *Studies in Music*, 5 (1971): 1–35.
- McCreless, Patrick. "Contemporary Music Theory and the New Musicology: An Introduction." *Music Theory Online*, 2.2 (1996).

McCune, Marc. "Moritz Hauptmann: *Ein Haupt-Mann* in Nineteenth-Century Music Theory." *Indiana Theory Review* 7/2 (1986): 1–28.

- McDonough, Richard M. *The Argument of the Tractatus*. Albany: State University of New York Press, 1986.
- McGuinness, Brian F. "The *Grundegedanke* of the Tractatus." In *Understanding Wittgenstein*, edited by G. Vesey. London: MacMillan, 1984.
- Mead, Andrew. An Introduction to the Music of Milton Babbitt. Princeton: Princeton University Press, 1994.

- Merleau-Ponty, Maurice. *The Primacy of Perception*. Evanston, Ill.: Northwestern University Press, 1964.
- Meyer, Leonard B. *Emotion and Meaning in Music*. Chicago: University of Chicago Press, 1956.

———. Explaining Music: Essays and Explorations. Berkeley and Los Angeles: University of California Press, 1973.

. *Music, the Arts, and Ideas*. Chicago: University of Chicago Press, 1967.

Mondrian, Piet. "Art Without Subject Matter [1938]." In *The New Art – The New Life: The Collected Writings of Piet Mondrian,* edited and translated by H. Holtzmann and M. S. James. London: Thames and Hudson, 1986.

———— . "Plastic Art and Pure Plastic Art [1936]." In *The New Art* – *The New Life: The Collected Writings of Piet Mondrian*, edited and translated by H. Holtzmann and M. S. James. London: Thames and Hudson, 1986.

Monk, Ray. Ludwig Wittgenstein: The Duty of Genius. New York: Free Press, 1990.

Montgomery, Kip. "Schenker and Schoenberg on Harmonic Tonality." *Indiana Theory Review*, 15/1 (Fall, 1994): 53–68.

Moore, George E. Commonplace Book. Edited by C. Lewy. London: Allen, 1962.

. "A Defence of Common Sense." In *Contemporary British Philosophy*: *Personal Statements*. Second Series, edited by H. D. Lewis. London: Allen, 1925. Reprinted in *The Theory of Knowledge*, edited by Louis J. Pojman. Stanford, Conn.: Wadsworth Publishing, 1999.

Morris, Robert D. *Composition with Pitch-Classes: A Theory of Compositional Design*. New Haven: Yale University Press, 1987.

Moss, Myra E., ed. and trans. *Benedetto Croce: Essay on Literature and Literary Criticism.* Albany, New York: State University of New York Press, 1990.

Mounce, H. O. "Understanding a Primitive Society." Philosophy, 48 (1973): 347-62.

Mounin, Georges. Saussure ou le structuralisme sans le savoir. Paris: Segher, 1968

Neurath, Otto. "Personal Life and Class Struggle." In *Empiricism and Sociology*, edited by Marie Neurath and Robert S. Cohen. Dordrecht, Holland: Reidel, 1973.

— . *Philosophical papers:* 1913-1946. Dordrecht, Holland: Reidel, 1983.

Newell, R. W. *Objectivity, Empiricism, and Truth.* New York: Routledge & Kegan Paul, 1986.

Nietzsche, Friedrich. Beyond Good and Evil: Prelude to a Philosophy of the Future [Jenseits von Gut und Böse]. New York: Vintage, 1966.

. The Birth of Tragedy Out of the Spirit of Music [Die Geburt der Tragödie aus dem Geiste der Musik, 1870-71]. Translated by Francis Golffing. New York: Doubleday, 1956.

Nolan, Catherine. "Combinatorial Space in Nineteenth- and Early Twentieth-Century Music Theory." Paper presented at the Annual Meeting of the Society for Music Theory, Toronto, November, 2000.

. "Serial and Metaserial Elements in a Twelve-Tone Work: Local and Long-Range Coherence in Webern's Op. 24/II." Paper presented at the Annual Meeting of the Society for Music Theory, Baton Rouge, Louisianna, November, 1996.

- O'Donnell, Shaugn. "Klumpenhouwer Networks, Isography, and the Molecular Metaphor." *Intégral*, 12 (1999): 53–80.
- Palisca, Claude V., ed. *Hucbald, Guido, and John on Music: Three Medieval Treatises*. New Haven: Yale University Press, 1979.

- Parker, Robert W. "Wittgenstein's Net and Schubert's Mass in G: Asking the Right Questions about Performance Practice." Paper presented to the Pacific Southern Chapter of the College Music Society, 1997.
- Parson, C. "On a Number-Theoretic Choice Schema and its Relation to Induction." In *Intuitionism and Proof Theory*, edited by J. Myhill, et al. New York: North Holland, 1970.

Pastille, William. "Schenker's Value Judgments." Music Theory Online, 1.6 (1995).

Pears, David. Ludwig Wittgenstein. New York: Penguin, 1977.

- Perle, George. *The Listening Composer*. Berkeley and Los Angeles: University of California Press, 1990.

 - *_______ . Serial Composition and Atonality: An Introduction to the Music of Schoenberg, Berg, and Webern.* 6th ed. Berkeley and Los Angeles: University cf California Press, 1991.
- Peterson, David J. *Revoking the Moral Order: The Ideology of Positivism and the Vienna Circle*. New York: Lexington Books, 1999.
- Peterson, Donald M. "Logical Space and Truth-Functionality." In *The Tasks of Contemporary Philosophy: Reports on the Tenth International Wittgenstein Symposium*, edited by A. Leinfellner and M. Wuketits. Vienna: Hölder, 1986.

———— . Wittgenstein's Early Philosophy: Three Sides of the Mirror. Toronto: University of Toronto Press, 1990.

Philippot, Michael. "Ear, Heart and Brain." *Perspectives of New Music*, 15 (1976) 45–60.

Phillips, D. Z., ed. "Mysticism and Epistemology: One Devil of a Problem." *Faith and Philosophy*, 12/2 (1995): 167–88.

. "Wittgenstein's Full Stop." In *Perspectives on the Philosophy of Wittgenstein*, edited by Irving Block. Cambridge: M.I.T. Press, 1981. Reprinted in *Wittgenstein: Aesthetics, Ethics and Religion,* edited by John V. Canfield. Vol. 4 of *The Philosophy of Wittgenstein*. New York: Garland, 1986.

- Phipps, Graham. "Comprehending Twelve-Tone Music as an Extension of the Primary Musical Language of Tonality." *College Music Symposium*, 24/2 (Fall, 1984): 35–84.
- Pitcher, George. *The Philosophy of Wittgenstein*. Englewood Cliffs, N. J.: Prentice-Hall, 1964.
- Popper, Karl R. Evolutionary Epistemology, Rationality, and the Sociology of Knowledge. Lasalle, Ill.: Open Court, 1987.

———. The Myth of the Framework: In Defence of Rationality. London: Routledge, 1994.

—. *The Poverty of Historicism*. New York: Asic Books, 1960.

. *Unended Quest: An Intellectual Autobiography.* London: Fontana, 1976.

Quine, Willard V. O. "Epistemology Naturalized." In *Epistemology: The Big Questions*, edited by Linda M. Alcoff. Oxford: Blackwell, 1998.

——— . Ontological Relativity, and Other Essays. New York: Columbia Press. 1969.

. "Two Dogmas of Empiricism." *The Philosophical Review* 60 (1951): 20-43. Reprinted in W. V. O. Quine, *From a Logical Point of View*. Cambridge Mass.: Harvard University Press, 1953.

Raessler, D. M. "Schoenberg and Busoni: Aspects of Their Relationship." *Journal* of the Arnold Schoenberg Institute, 7/1 (June, 1983): 7–27.

Rahn, John. "Aspects of Musical Explanation." Journal of Music Theory, 1980.

-------. "Notes on Methodology in Music Theory." *Journal of Music Theory*, 1989.

Rameau, Jean-Philippe. *Nouveau système de musique théorique* [1726]. New York: Broude Brothers, 1965.

. *Treatise on Harmony* [*Traité de l'harmonie*, 1722], Translated by Phillip Gossett. New York: Dover, 1971.

Ramsey, Frank P. *The Foundations of Mathematics and Other Logical Essays*. London: Routledge, 1931.

Raphael, Frederic. *Popper*. London: Phoenix, 1998.

- Regener, Eric. "Layered Music-Theoretic Systems." *Perspectives of New Music*, 6,'1 (Fall-Winter, 1967): 52–66.
- Rescher, N. *Objectivity: The Obligations of Impersonal Reason*. Notre Dame: University Press, 1997.
- Rhees, Rush, ed. *Recollections of Wittgenstein*. Oxford: Oxford University Press, 1984.
- Richardson, Alan W. Carnap's Construction of the World: The Aufbau and the Emergence of Logical Positivism. Cambridge: Cambridge University Press, 1997.
- Riemann, Hugo. Theory of Harmony and History of Music Theory, Book III [Geschichte der Musiktheorie in IX.-XIX. Jahrhundert, 1898]. Translated by William Mickelson. Lincoln: University of Nebraska Press, 1977.
- Ringer, Alexander L. "Schoenberg and the Prophetic Image in Music." *Journal of the Arnold Schoenberg Institute*, 1/1 (October, 1976): 26–38.

Robinson, Jenefer, ed. Music and Meaning. Ithaca: Cornell University Press, 1997.

Rorty, Richard, ed. *The Linguistic Turn*. Chicago: University of Chicago Press, 1975.

Rosen, Charles. Arnold Schoenberg. Chicago: University Press, 1975.

- Rothfarb, Lee. "Hermeneutics and Energetics: Analytical Alternatives in the Early 1900s." *Journal of Music Theory*, 36 (1992): 43–68.
- Rowell, Lewis. *Thinking About Music: An Introduction to the Philosophy of Music.* Amherst, Mass.: University of Massachusetts Press, 1983.
- Rudhyar, Dane. *The Magic of Tone and the Art of Music*. Boston: Shambala Press, 1982.
- Rufer, Josef. *Composition with Twelve Tones* [*Die Komposition mit zwölf Tönen*, 1952]. Translated by Humphrey Searle. London: MacMillan, 1954.

Russ, Michael. "On Schenkerism: A Closed Circle of Elite Listeners?" *Music Analysis*, 12/2 (1993): 266–85.

Russell, Bertrand. Autobiography. London: Unwin, 1975.

. "Mathematical Logic as Based on the Theory of Types [1908]." In *From Frege to Gödel: A Source Book in Mathematical Logic, 1879-1931,* edited by J. van Heijenoort and translated by S. Bauer-Mengelberg. Cambridge: Harvard University Press, 1967.

————. Principia Mathematica. London: Geo. Allen & Unwin, 1908.

. The Problems of Philosophy. Oxford: Oxford University Press, 1912.

Schenker, Heinrich. *Free Composition* [*Der freie Satz*, 1911]. Translated by Ernst Oster. New York: Longmans, 1979.

. *The Masterwork in Music: A Yearbook*. Vol. 2 [*Das Meisterwerk in der Musik*, II, 1926]. Edited by William Drabkin and translated by Ian Bent. Cambridge: Cambridge University Press, 1996.

Schiff, David. "Jewish and Musical Tradition in the Music of Mahler and Schoenberg." *Journal of the Arnold Schoenberg Institute*, 9/2 (1986): 217–31.

Schlick, Moritz. *General Theory of Knowledge* [Allgemeine Erkenntnislehre, 1918]. Translated by Albert E. Blumberg. New York: Springer-Verlag, 1974.

. "Die Wende der Philosophie." In *Gesammelte Aufsatze*. Vienna: Gerold, 1938. Reprinted and translated as "The Turning Point in Philosophy." In *Logical Positivism*, edited by A. J. Ayer, translated by David Rynin. New York: Free Press, 1959.

Schneider, A. Analogie und Rekonstruktion: Studien zur Methodologie der Musikgeschichtsschreibung und zur Frühgeschichte der Musik. Bonn: Verlag für systematische Musikwissenschaft, 1984. . *Musikwissenschaft und Kulturkreislehre*. Bonn: Verlag für systematische Musikwissenschaft, 1976.

Schoenberg, Arnold. Coherence, Counterpoint, Instrumentation, Instruction in Form [Zusammenhang, Kontrapunkt, Instrumentation, Formenlehre, 1917-36]. Edited by Severine Neff and translated by Charlotte M. Cross and Severine Neff. Lincoln: University of Nebraska Press, 1994.

———— . Fundamentals of Musical Composition. Edited by Gerald Strang and Leonard Stein. London: Faber & Faber, 1967.

The Musical Idea and the Logic, Technique, and Art of Its Presentation
[Musicalische Gedanke und die Logik, Technik, und Kunst seiner Darstellung, 1923-36]. Edited, translated, and with a commentary by Patricia Carpenter and Severine Neff. New York: Columbia University Press, 1995.

Theory of Harmony [Harmonielehre, 1911]. Translated by Roy Carter. Berkeley and Los Angeles: University of California Press, 1978.

Schopenhauer, Arthur. *The World as Will and Representation* [*Die Welt al Wille und Vorstellung*, 1818]. Translated by E. F. J. Payne. New York: Dover, 1966.

Schorske, Carl E. *Fin-de-Siècle Vienna: Politics and Culture.* New York: Vintage Books, 1981.

Scruton, Roger. "Analytical Philosophy and the Meaning of Music." *Journal of Aesthetics and Art Criticism*, 66 (1987), 169–76.

- Seeger, Charles. "Systematic Musicology: Viewpoints, Orientation, Methods." Journal of the American Musicological Society, 4/3 (Fall 1951), 240–50.
- Serafine, Mary L. *Music as Cognition: The Development of Thought in Sound*. New York: Columbia University Press, 1988.

Shanker, Stuart G. *Wittgenstein and the Turning-Point in the Philosophy of Mathematics*. Albany: State University of New York Press, 1987.

- Shoaf, R. Wayne. "From the Archives: The Felix Greissle Collection." *Journal of the Arnold Schoenberg Institute*, 10 (1987): 65–81.
- Siegel, Harvey. "Kuhn and Relativism: Is He or Isn't He?" Chap. 3 in *Relativism Refuted: A Critique of Contemporary Epistemological Relativism*. Boston: D. Reidel, 1987.

Simms, Bryan R. "New Documents in the Schoenberg-Schenker Polemic." *Perspectives of New Music*, 16/1 (Fall-Winter, 1977): 110–24.

————. "Review of *Theory of Harmony* by Arnold Schoenberg," *Music Theory Spectrum*, 4 (1982): 155–62.

- Smith, Charles J. "Musical Form and Fundamental Structure: An Investigation of Schenker's *Formenlehre*." *Music Analysis*, 15/2-3 (July-October, 1996): 191–297.
- Soderberg, Stephen. "Riemannian Variations on a Theme by Babbitt." *Perspectives* of New Music, 35/2 (1997): 7–15.
- Solie, Ruth, ed. *Musicology and Difference: Gender and Sexuality in Music Scholarship.* Berkeley and Los Angeles: University of California Press, 1993.

Solomon, Larry J. "The List of Chords, Their Properties and Use in Analysis." Interface, 2/2 (1982): 61–107.

Sosa, Ernest. The Blackwell Guide to Epistemology. Malden, Mass.: Blackwell, 1999.

———. A Companion to Epistemology. Oxford: Blackwell, 1992.

——— . Knowledge in Perspective: Selected Essays in Epistemology. Cambridge: University Press, 1991.

Spies, Claudio. "Schoenberg's Influence on Composing in America." *Journal of the Arnold Schoenberg Institute*, 19/2 (November, 1996): 753–65.

Spitta, Philipp J. A. J. S. Bach. Vol. 2. Leipzig, 1880.

Spratt, John F. "The Speculative Content of Schoenberg's *Harmonielehre*." *Current Musicology*, 11 (1971): 83–88.

- Stadler, Friedrich. The Vienna Circle: Studies in the Origins, Development, and Influence of Logical Empiricism. Vienna and New York: Springer-Verlag, 2001
- Staten, Henry. *Wittgenstein and Derrida*. Lincoln: University of Nebraska Press, 1984.
- Stein, Erwin, ed. *Arnold Schoenberg Letters*. Translated by E. Wilkins and E. Kaiser. London: Faber & Faber, 1964.
- Stein, Leonard, ed. *Arnold Schoenberg Vassily Kandinsky: Letters, Pictures and Documents*. Translated by John C. Crawford. London: Faber and Faber, 1984.
- Steiner, George. "Schoenberg's Moses and Aaron." Chap. 10 in *Language and Silence*. New York: Atheneum, 1967.
- Stenius, Erik. Wittgenstein's Tractatus: A Critical Exposition of its Main Lines of Thought. Hartford, Conn.: Greenwood Press, 1981.
- Strunk, Oliver, ed. Source Readings in Music History: From Classical Antiquity through the Romantic Era. New York: Norton, 1950.
- Subotnik, Rose. "Toward a Deconstruction of Structural Listening: A Critique of Schoenberg, Adorno, and Stravinsky." In Explorations in Music, the Arts, and Ideas: Essays in Honour of Leonard B. Meyer, edited by Eugene Narmour and Ruth A. Solie. Stuyvesant, N.Y.: Pendragon Press, 1988.

Swain, Joseph P. Musical Languages. New York: Norton, 1997.

Taruskin, Richard. "Reply to Brown and Dempster." *Journal of Music Theory*, 33 (1989): 155–74.

-."Reply to Van den Toorn." *In Theory Only*, 10/3 (1987): 47–57.

Tenney, James. A History of Consonance and Dissonance. Bryn Mawr, Pa.: Excelsior, 1988.

- Terhardt, Ernst. "Gestalt Principles and Music Perception." In *Auditory Processing* of *Complex Sounds*, edited by W. A. Yost and C. S. Watson. Hillsdale, N. J.: Erlbaum, 1986.
- Thomson, William. "A Clarification of the Tonality Concept." Ph.D. Dissertation, Indiana University, 1952.

. "Hindemith's Contribution to Music Theory." *Journal of Music Theory*, 9 (1965), 52–71.

— . *Schoenberg's Error*. Philadelphia: University of Pennsylvania Press, 1991.

- Tilghman, Benjamin R. *Wittgenstein, Ethics and Aesthetics: The View from Eternity*. Albany: State University of New York Press, 1991.
- Tinctoris, Johannes. *The Art of Counterpoint* [*Liber de arte contrapuncti*, 1477]. Edited and translated by A. Carapetyan. Rome: Musicological Studies and Documents, 1961.

Tomlinson, Gary. "Musical Pasts and Postmodern Musicologies." *Current Musicology*, 53 (1993): 18–24.

Torretti, R. Relativity and Geometry. Oxford: Pergamon, 1983.

Trusted, Jennifer. The Logic of Scientific Inference. London: MacMillan, 1979.

Unger, P. K. *Philosophical Relativity*. Minneapolis: University of Minnesota Press, 1984.

Van den Toorn, Pieter. *Music, Politics, and the Academy*. Berkeley and Los Angeles: University of California Press, 1995.

------. "Taruskin's Angle." In Theory Only, 10/3 (1987): 27-46.

. "What Price Analysis." *Journal of Music Theory*, 33 (Spring, 1989): 165-89.

Van San, Herman. "Sundry Notes Introductory to the Theoretical Mechanics of Mathematical Music," *Interface*, 2 (1973): 23–50.

Vogel, Martin. Die Lehre von den Tonbeziehungen. Bonn: Verlag für systematische Musikvissenschaft, 1975.

Waismann, Friedrich. "How I See Philosophy." In *Logical Positivism*, edited by Alfred J. Ayer. New York: The Free Press, 1959.

_____. The Principles of Linguistic Philosophy. London: MacMillan, 1965.

Walser, Robert. "The Body in the Music: Epistemology and Semiotics." *College Music Symposium*, 31 (1991): 117–26.

Walton, Kendall. "Listening with Imagination: Is Music Representational?" In Music and Meaning, edited by Jenefer Robinson. Ithaca: Cornell University Press, 1997.

———. *Mimesis as Make-Believe: On the Foundations of the Representational Arts.* Cambridge: Harvard University Press, 1991.

- Wang, Yuhwen. "Value Judgment and Musical Explanation: Their Roles in Selected Writings of Edward T. Cone." Ph.D. Dissertation, Columbia University, 1998.
- Ward, S. C. Reconfiguring Truth: Postmodernism, Science Studies, and the Search for a New Model of Knowledge. Lanham, Md.: Rowman and Littlefield Publishers, 1996.
- Warren, R., and R. Warren. *Helmholtz on Perception*. New York: Wiley & Sons, 1968.
- Wason, Robert. *Viennese Harmonic Theory from Albrechtsberger to Schenker and Schoenberg*. Ann Arbor: U.M.I. Press, 1984.
- Weber, Gottfried. *The Theory of Musical Composition* [Versuch einer geordneten *Theorie der Tonsetzkunst*, 1832]. Translated by J. F. Warner London, 1851.
- Weiner, David A. Genius and Talent: Schopenhauer's Influence in Wittgenstein's Early Philosophy. London and Toronto: Associated University Press, 1992.
- Weise, Christopher. "Is a Serial Revival Possible." New Modern Music: A Review of Contemporary Music and Culture, 2 (Fall, 1999) (Online Serial).
- Westermarck, Edward. Ethical Relativity. Paterson, N. J.: Littlefield, 1960.
- Weyl, Hermann. *The Open World: Three Lectures on the Metaphysical Implications of Science*. New Haven: Yale University Press, 1932.
- White, Pamela C. *Schoenberg and the God-Idea: The Opera Moses and Aron*. Ann Arbor: U.M.I. Research Press, 1985.

Wilson, John C. Statement and Inference. Oxford: Clarendon, 1926.

Winch, Peter. "Can a Good Man be Harmed?" In *Wittgenstein: Aesthetics, Ethics and Religion,* edited by John V. Canfield. Vol. 4. of *The Philosophy of Wittgenstein.* New York: Garland, 1986.

- Wintle, Christopher W. "Schoenberg's Harmony: Theory and Practice." *Journal of the Arnold Schoenberg Institute*, 4/1 (June, 1980): 50–67.
- Wiora, Walter. "Musikwissenschaft und Universalgeschichte." Acta Musicologica, 33 (1961): 84–104.

Wisdom, John. "Logical Constructions (I)," Mind, 40 (April, 1931): 188-216.

Wittgenstein, Ludwig. *Culture and Value*. Edited by G. H. von Wright, translated by Peter Winch. Chicago: University Press, 1980.

Lectures and Conversations on Aesthetics, Psychology, and Religious Belief. Edited by Cyril Barrett. Oxford: Blackwell, 1966

— . "Lecture on Ethics" *Philosophical Review*, 48 (1972): 38–54 .

. *Lectures on the Foundations of Mathematics, Cambridge* 1939. From the notes of R. Bosanquet, N. Malcolm, R. Rhees, and Y. Smythie. Ithaca, N.Y.: Cornell University Press, 1976.

. "Letters to Ludwig von Ficker." In *Wittgenstein: Sources and Perspectives*, edited by C. G. Luckhardt and translated by Bruce Gillette. Ithaca, N.Y.: Cornell University Press, 1979.

. "Note for Lectures on 'Private Experience' and 'Sense Data.'" Edited by Rush Rhees. *Philosophical Review*, 78/3 (1968): 275–300.

------ . *Notebooks:* 1914-1916. 2nd ed. Edited G. H. von Wright and G. E. M. Anscombe, translated by G. E. M. Anscombe. Oxford: Blackwell, 1979.

——— . *Philosophical Remarks*. Edited by R. Rhees, translated by R. Hargreaves and R. White. Oxford: Blackwell, 1975.

———— . *Prototractatus: An Early Version of the Tractatus Logico-Philosophicus*. Edited by Brian F. McGuinness, T. Nyberg, and G. H. von Wright. London: Routledge, 1971.

———— . *Remarks on the Foundations of Mathematics*, 1937-39. Edited by G. H. von Wright, R. Rhees, and G. E. M. Anscombe, translated by G. E. M. Anscombe. Cambridge: M.I.T. Press, 1972.

Wong, D. B. *Moral Relativity*. Berkeley and Los Angeles: University of California Press, 1984.

Wright, Crispin. *Wittgenstein on the Foundations of Mathematics*. Cambridge: Harvard University Press, 1980.

Wright, Crispin, and Graham MacDonald, eds. *Facts, Science and Morality: Essays* on A. J. Ayer's Language, Truth and Logic. Oxford: Blackwell, 1986.

Wright, G. H. von. "The Origin of Wittgenstein's *Tractatus.*" In *Wittgenstein: Sources and Perspectives*, edited by C. G. Luckhardt. Ithaca: Cornell University Press, 1979.

Wright, James K. "Auditory Object Perception: Counterpoint in a New Context." M.A. Thesis, McGill University, Montreal, 1986.

-------. "From Rameau's *Corps Sonore* to Bregman's *Auditory Scene*: Psychoacoustic Models for Understanding Harmonic Grouping and Interval Quality." Paper presented at the Congress of the International Musicological Society, Royal College of Music, London, August, 1997.

- Wright, James K., and Albert S. Bregman "Auditory Stream Segregation and the Control of Dissonance in Polyphonic Music." *Contemporary Music Review*, 2/1 (1987): 63–92.
- Zabeeh, Farhang. *Universals: A New Look at an Old Problem.* The Hague: Martinus Nijhoff, 1966.

- Zarlino, Gioseffo. *The Art of Counterpoint* [*Le Institutioni harmonische*, 1558]. Translated by G. A. Marco and Claude A. Palisca. New Haven: Yale University Press, 1968.
- Ziehn, Bernard. *Canonical Studies: A New Technic of Composition* [1912]. London: Kahn & Averill, 1994.
- Zuckerkandl, Victor. *Sound and Symbol: Music and the External World*. Princeton: Princeton University Press, 1956.