

James A. Davis, "Positivism, Logic and Atonal Analysis," *The Music Review* 53/3 (1992), 210–20.

Theory has been defined as "the analysis of a set of facts in their relations to one another" or "the general or abstract principles of a body of fact, a science, or an art".¹ Each of these phrases conveys an image of generality, indicating an "umbrella" approach that seeks to draw broad conclusions from sets of particular instances. It could be said, then, that music theory is concerned with abstract principles, or, as *The New Grove* says, it is "principally the study of the structure of music",² with "music" in this case implying a plurality as opposed to the singular "composition". It is hoped that music theory as defined here begins at some point with particulars of some sort and attempts to determine the general principles from these specifics.

"Analysis" has been defined as the "separation of a whole into its component parts" or "an examination of a complex, its elements, and their relations".³ Whereas theory is seen as a broad concept that subsumes specific objects within it, analysis focuses more on the specific object. At the risk of over-simplifying, it could be said that theory is more concerned with universals, whereas analysis deals with particulars. On the surface this definition of analysis seems straightforward enough, though there are many important aspects that still require clarification. For example: what constitutes the elements to be analysed, in what way is analysis involved with particulars, and what is the purpose of such an analysis? Ultimately it is the result of numerous analyses that provides the necessary input to formulate a theory. But is this the sole purpose of analysis—to act as a fact-finding mission for theory construction? In some scholarly fields this may be the case, but in music scholarship this is far from acceptable. In fact, music theory is more often seen as a necessary background to the primary task of music analysis. Much scholarship is more concerned with analytic results regarding particular compositions than with theories that apply to many different works.

Music theorists have often looked outside their field in an attempt to clarify issues such as these as well as to find models upon which to base their theoretical systems. This was true of rhetoric for Listenius and Burmeister, of semiotics for Nattiez and Agawu, and it is also the case with the foundations of atonal theory. In the work of theorists such as Babbitt and Forte there is both an implicit and an explicit reliance on the concepts of philosophical positivism. However, the use of tenets from one realm of thought within the context of a different discipline can lead to difficulties. In the case of positivism and atonal music theory, there are numerous

1 *Webster's New Collegiate Dictionary* (Springfield: G. & C. Merriam, 1980), p. 1200. I should like to thank John Daverio, Randy Dipert, Tom Regelski, Charles Smith, Kofi Agawu and Pat McCreless for their comments on earlier versions of this paper.

2 Claude V. Palisca, "Theory, theorists". *The New Grove Dictionary of Music and Musicians*, ed. S. Sadie. Vol. 18 (London: Macmillan, 1980), p. 741.

3 *Webster's*, 1980, p. 41.

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situations where the ideas involved are by no means as compatible as they might appear at first glance. It is therefore necessary to clarify certain concepts of philosophical positivism to see what kind of foundation it provides for a system of music analysis, while at the same time considering some of the larger questions that surround music analysis in general.

In 1922 the *Tractatus Logico-Philosophicus* of Ludwig Wittgenstein was published, a work that he (and others) believed to have eliminated most of the perennial questions of philosophy. This treatise also represents to some degree the culmination of the early development of modern positivistic philosophy, begun principally by Gottlob Frege and Bertrand Russell. The *Tractatus* holds that most of the traditional questions of philosophy are not really questions at all. A close scrutiny of the structure of the propositions in which these questions are presented reveals that most metaphysical questions and claims are "nonsensical". Frege and Russell had attempted to show that the propositions of logic were the only valid foundation for an investigation of meaning and truth; yet Wittgenstein showed that logical propositions can be reduced to either tautologies or contradictions and hence are incapable of providing any meaning not already found in the elements of the proposition.

These philosophers, as well as others who adopted their beliefs, felt that the predominantly idealist philosophies that had dominated the nineteenth century were too unstable and unclear a foundation to provide satisfactory answers to their questions. They wanted to ground philosophical thought in more tangible and empirical means and rejected the metaphysical, mental or even "mystical" aspects of earlier philosophies. Philosophy, they believed, needed to emulate the methods and concepts of science if it intended to provide concrete and defensible solutions.⁴

At the same time that Wittgenstein was developing his ideas in the *Tractatus*, the Vienna Circle (which included Schlick, Carnap, Feigl, Godel, Hahn, Neurath and Waismann) was formulating a strict empirical-logical approach commonly referred to as Logical Positivism and borrowing from Wittgenstein's work to some degree. Among other things the Logical Positivists claimed that the meaning of a proposition was its means of verification (known as the verification principle), thereby shifting the primary role of philosophy to the study of logic and the analysis of the structure of language.

Despite the subtle differences that these philosophers may exhibit, the roots of what might loosely be defined as a "positivistic" philosophy can be formulated by isolating certain tendencies that its practitioners exhibit.⁵ These tendencies include a

4 For a detailed discussion of the relationship between science and philosophy in the nineteenth century, see Herbert Schnadelbach, *Philosophy in Germany 1831-1933*, trans. Eric Matthews (Cambridge: Cambridge University Press, 1984), especially Chapters 1 & 3.

5 "Perhaps the distinction between analytic and traditional philosophy is just a matter of style and a matter of the emphasis placed upon the three criteria [(1) the emulation of science; (2) the introduction of research programs; and (3) the placing of logic and language at the focal point of philosophy] by members of the analytic movement". Michael D. Resnik. "Frege and Analytic Philosophy: Facts and Speculations" in *Midwest Studies in Philosophy*, Volume VI: "The Foundations of Analytic Philosophy", ed. P. A. French et al. (Minneapolis: University of Minnesota Press, 1981), p. 88. Obviously "positivistic philosophy", or "positivism", is rather a general classification to work with. It may have been better to use the more specific title "logical empiricism", as Oswald Handing does, though this would have removed certain valuable connotations and possibly eliminated the chance for interesting comparisons between philosophy and music theory.

rigid empiricism that leads to an emulation of science in both methodology and terminology; a rejection or avoidance of metaphysics; the use of linguistic and logical analysis; and, partly as a result of the above characteristics, the avoidance of subjective interpretation.

In a general sense modern positivism is an empirical approach taken to an extreme. Positivists attempt to deal only with "facts", usually meaning either data gained through observation, or logically deducible truths (as in the case of mathematics). In either case the attempt is to limit the content of any philosophical discourse to only those entities and concepts that are "objectively" provable. In many ways this approach emulates a traditional view of the hard sciences, and it is no surprise that the positivists see science as the ideal mode of investigation.⁶ Whereas the scientist is more prone to experiment manually in one fashion or another with materials taken from the "real world", positivist philosophers make use of formal logic, mathematics and linguistics as their objects of investigation, for it is with these tools that the philosopher can provide concrete and objective results.⁷

Following the lead of the early Wittgenstein, the positivists tended to reject the metaphysical or anything that falls beyond the realm of the empirically verifiable. This includes the investigation of any mental phenomena as well, with the result being that any analyses of interpretation or subjective participation are all but ignored.⁸ And the need for objective, scientific tools with which to address esoteric philosophical questions led these philosophers to develop many different forms of analysis.⁹ This includes both linguistic analysis, wherein sentences are scrutinized to evaluate their meaning and truth-content, and also logical analysis, wherein problems or specific propositions are translated into symbolic logic to test their validity.

These are but some of the ways in which positivists sought to revitalize philosophy. The metaphysical and subjective baggage of idealistic philosophies was rejected in favour of an objective approach, which, they believed, could not only compete with, but was a part of, the unassailable fortress of scientific knowledge. A similar process can be found in the development of music theory.¹⁰ Beginning in the

⁶ Resnik. 1981, p. 86: "Analytic philosophy emulates science not only in the sense that many of its practitioners take it to be prescience or continuous with science but also in the sense that it lays claim to precision, demands attention to detail, and has developed its own battery of technical terms and results . . . Just as research programs in science are prompted by empirical problems and aim at establishing scientific hypotheses, so analytic philosophers in emulating science have proposed hypotheses for dealing with philosophical problems and have pursued research programs that attempt to establish them".

⁷ See Bertrand Russell. *A History of Western Philosophy* (New York: Simon & Schuster, 1945), p. 828.

⁸ See Robert R. Ammerman, ed.. *Classics of Analytic Philosophy* (New York: McGraw-Hill, 1965), p. 2; John R. Searle, "Analytic Philosophy and Mental Phenomena" in *Midwest Studies in Philosophy*, Volume VI: "The Foundations of Analytic Philosophy", ed. P. A. French et al. (Minneapolis: University of Minnesota Press, 1981), p. 405.

⁹ Resnik, 1981, p. 88.

¹⁰ There are countless references, both implicit and explicit, to the positivistic or scientific orientation of atonal theory: e.g., William Benjamin, "The Structure of Atonal Music by Allen Forte", *Perspectives of New Music*, 13/1 (Fall-Winter, 1974), pp. 170-190; Jason Gibbs, "Review of Words About Music by Milton Babbitt", *In Theory Only*, 10/8 (1988), pp. 15-23; Joseph Kerman, *Contemplating Music* (Cambridge: Harvard University Press, 1985); Fred Everett 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), pp. 214-222; Robert P. Morgan, "On the Analysis of Recent Music", *Critical Inquiry*, 4/1 (1977)- pp- 33-54- Richard Taruskin, "Review of The Harmonic Organization of the Rite of Spring", *Current Musicology*, 28 (1979), pp. 114-129. For a more recent discussion of Babbitt's intellectual

1950s, many music theorists began to adopt a more scientific methodology in the hopes of granting their practice a certain measure of respectability that they thought was lacking. An examination of the work of Babbitt, Forte, Boretz, Kassler and others reveals that they share the same basic outlook described above.¹¹ The transference of these principles of philosophy to music scholarship is by no means as easy as many theorists have implied; in fact, a close examination reveals many difficulties.

To define completely and adequately the entire scope and methods of music theory and analysis, though an enticing project, is beyond the limits of this study. Each is a complex subject containing a variety of issues, such as the technical apparatus used, the intention of the theorist and analyst, the goal or focus of an analysis or theory and so on. Ideally each of these issues would be considered in its turn, though it quickly becomes apparent that it is nearly impossible to separate them completely. For example: the choice of analytic technique will depend on what the analyst hopes to find and will, at the same time, presuppose the audience toward which the completed analysis is directed. It is necessary, though, that some criteria for these concepts be established to help determine the relationship between positivistic thought and music scholarship. Since there is evidence that positivistic philosophy has been used as a model for certain atonal music theories, I will focus this discussion by examining certain characteristics of philosophical analysis and the positivistic theories that underlie these techniques in order to ascertain the applicability of such thoughts to music research.

It would be futile to offer a single definition for philosophical analysis, for each practitioner will exhibit subtle differences both in the general concept of analysis and in the specific means of application. For a broader perspective, it may be best to start with Russell, considered to be one of the first (if not the first) to employ philosophical analysis. Generally speaking, Russell viewed reality as "one great analyzable complex", which could be dissected to reveal its particular constituents.¹² This process of dissection, of reducing a complex whole into parts, is analysis. Obviously such a broad definition is equally applicable to any form of analysis in any field. For philosophy, however, this process differs most notably in the actual object being analysed. The analysis of real entities, the examination of empirical facts, was considered the business of scientists; the philosopher analysed concepts.¹³ The

background, see Martin Brody, " 'Music for the Masses': Milton Babbitt's Cold War Music Theory". *The Musical Quarterly*, nll (1993), pp. 161-192.

¹¹ A partial list of the primary sources where this approach can be found includes Milton Babbitt, "Contemporary Music Composition and Music Theory as Contemporary Intellectual History", in *Perspectives in Musicology*, ed. B. Brook et al. (New York: W. W. Norton, 1972), pp. 151-84; "Past and Present Concepts of the Nature and Limits of Music", in *Perspectives on Contemporary Music Theory*, ed. B. Boretz and E. T. Cone (New York: W. W. Norton, 1972), pp. 3-9; "The Structure and Function of Musical Theory", in *Perspectives on Contemporary Music Theory*, ed. B. Boretz and E. T. Cone (New York: W. W. Norton, 1972), pp. 10-21; Benjamin Boretz. "Meta-Variations: Studies in the Foundations of Musical Thought (1)", *Perspectives of New Music*, 8 (Fall-Winter, 1969), pp. 1-74; Allen Forte, *The Structure of Atonal Music* (New Haven: Yale University Press, 1973); "A Theory of Set-Complexes for Music", *Journal of Music Theory*, 8/2 (1964), pp. 136-183; Michael Kassler, "A Sketch of the Use of Formalized Languages for the Assertion of Music", *Perspectives of New Music*, 1/2 (1963), pp. 83-94; and John Rahn, "Logic, Set Theory, Music Theory", *Symposium*, 19/1 (1979), pp. 114-127; "Relating Sets", *Perspectives of New Music*, 18/1-2 (Fall-Winter, 1979-80), pp. 483-498.

¹² Morris Weitz, "Philosophical Analysis", *The Encyclopedia of Philosophy* (New York: Macmillan Publishing Co., 1967), Vol. 1, p. 97.

¹³ "To analyze, we may say roughly, is to take apart in order to gain a better understanding of what is

Logical Positivists originally conceived of their verification principle in the scientific way—that is, as being based exclusively on observational statements—but quickly shifted to the analysis of more abstract entities. Yet how is one to analyse such esoteric things without lapsing into inane and meaningless discussion? Here, as in other ways, the role of language is crucial. Positivistic philosophers saw that the only tangible manifestation of concepts or ideas is in language; it then became the purpose of philosophy to analyse language. Language in this sense is not restricted to ordinary language; it can include symbolic representations as well.

Assuming a somewhat isomorphic relationship between language and logic, positivistic philosophers believed it was possible to clarify many philosophical topics by examining the logical form of the propositions of ordinary language. As Russell says:

It gradually became clear that a great part of philosophy can be reduced to something that may be called "syntax", though the word has to be used in a somewhat wider sense than has hitherto been customary. Some men, notably Carnap, have advanced the theory that all philosophical problems are really syntactical, and that, when errors in syntax are avoided, a philosophical problem is thereby either solved or shown to be insoluble. I think this is an overstatement, but there can be no doubt that the utility of philosophical syntax in relation to traditional problems is very great.¹⁴

When analysing language, philosophers are not in a position to gauge the empirical truth of the proposition—that is, they do not examine the real world to see if the facts of the proposition line up accordingly. The philosopher evaluates the logical structure of a proposition to test its validity and to ensure that the proposition has meaning. This approach tends to create a sizable gap between what was to be the object of analysis and what is actually analysed; more precisely, propositions become the objects of analysis, not empirical facts. In the words of A. J. Ayer:

In other words, the propositions of philosophy are not factual, but linguistic in character- that is, they do not describe the behavior of physical, or even mental, objects; they express definitions, or the formal consequences of definitions. Accordingly, we may say that philosophy is a department of logic. For we shall see that the characteristic mark of a purely logical enquiry is that it is concerned with the formal consequences of our definitions and not with questions of empirical fact.¹⁵

In the place of factual analysis, we see instead an emphasis on formal analysis—that is, on the logical structure of a proposition.

To a positivist, a primary weakness of a metaphysical system is the unverifiable nature of the topics it embraces, which results in the esoteric language so prevalent in metaphysical discussions. They felt that systems of thought should be grounded as firmly as possible to avoid drifting into meaningless discourse. Originally, empirical confirmation was chosen to be the ideal foundation, though, as we have seen,

being analyzed . . . The philosopher, on the other hand, is interested in analyzing linguistic or conceptual units. He is concerned, in general, with coming to understand the structure of language by a careful study of its elements and their interrelations". Ammerman, 1965. p. 2

14 Russell, *History*, 1945, pp. 830-831. See also Michael Dummett, *The Interpretation of Frege's Philosophy* (Cambridge: Harvard University Press. 1981), p. 271; Moritz Schlick, "The Turning Point in Philosophy" in *Logical Positivism*, ed. A. J. Ayer (New York: The Free Press. 1959), pp. 55-6.

15 A. J. Ayer, *Language. Truth & Logic* (New York: Dover. 1952), p. 57.

linguistic structure or, more precisely, the logical structure of propositions—quickly became the object of philosophical analysis.

Logically deduced truths are universally true by definition, regardless of the sphere of thought in which they are found. Logical methods, on the other hand, may not be so universally applicable. Though the philosophical positivists sought to subsume the whole of philosophy under the methodology of logical empiricism, they were aware of certain stipulations that were required for this to happen. Specifically, they were conscious of the manner in which logic is applied and of the objects it is capable of addressing. Of course logic deals with generalities; but more importantly, as Russell and others made clear, it does not deal with particulars:

In logic, on the contrary, where we are concerned not merely with what does exist, but with whatever might or could exist or be, no reference to actual particulars is involved.¹⁶

If something is logically true, it is so because of the form of the proposition, not because of the particulars found within the proposition.

A logical premiss must have certain characteristics which can be defined: it must have complete generality, in the sense that it mentions no particular thing or quality; and it must be true in virtue of its form.¹⁷

Or, as Frege says, "What is of concern to logic is not the special content of any particular relation, but only the logical form".¹⁸

Frege's and Russell's emphasis on the logical form and structure of language was by no means accepted by all members of the philosophical community. Philosophy has always been concerned with language, but to assume that the major issues that have occupied philosophers could be resolved merely by scrutinizing propositions was seen by many as a means of evasion. Logical empiricism offers useful tools for philosophers and provides a necessary different perspective for many difficult questions, yet by no means is it capable of handling all the intricacies of human experience that make up the core of philosophical studies. What if instead of linguistic analysis we were to substitute music analysis? Is this approach any more readily acceptable?¹⁹

Like the philosophers before them, most positivist music theorists looked to the methods and language of formal logic as the ideal basis for their ideas. According to Babbitt,

Progressing from the concept to the law (synthetic generality) we arrive at the deductively

¹⁶ Bertrand Russell, *The Problems of Philosophy* (London: Oxford University Press, 1959), p. 56. Or: ". . . no proposition of logic can mention any particular object". Russell, *Principles of Mathematics* (New York: W. W. Norton, 1937), p. xi.

¹⁷ Russell, *Principles*, 1937, p. xii. As Sluga says, ". . . logic deals with the forms of thought rather than with actual contents and that the principles of logic must be universal". Hans D. Sluga, *Gottlob Frege* (London: Routledge & Kegan Paul, 1980), p. 108.

18 Gottlob Frege, *The Foundations of Arithmetic*, trans. J. L. Austin (Evanston: Northwestern University Press, 1980), p. 83. See also Gregory Currie, *Frege: An Introduction to His Philosophy* (Sussex: The Harvester Press, 1982), p. 157.

19 It would seem to be a less than desirable choice in view of this definition: "I have argued that whatever philosophical analysis is, the kind of philosophical analysis that dominates contemporary philosophy cannot be thought of as directed upon facts. This, for the simple reason that the existence of the relevant fact is in no way presupposed by the correctness of a philosophical analysis". Richard A. Fumerton, "The Paradox of Analysis", *Philosophy and Phenomenological Research*, 43/4 (1983), p. 486.

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interrelated system of laws that is a theory, statable as a connected set of axioms, definitions, and theorems, the proofs of which are derived by means of an appropriate logic. A musical theory reduces, or should reduce, to such a formal theory when uninterpreted predicates and operations are substituted for the terms and operations designating musical observables.²⁰

As this passage shows, Babbitt not only refers to logic as the basis upon which a theory should be constructed; his terminology implies that music theory is to be handled as if it were a type of formal logic.²¹ The transference of the principles of formal logic into the world of music theory is by no means a straightforward task. To deny the existence of some theoretical structure behind an analysis is naive, no matter what the theoretical inclination of the analyst. Likewise, it is reasonable to assume that logical reasoning will play a primary role in the construction and application of a theory. But it is equally naive to assume that the application of a well-founded theory, regardless of its reliance on logic, will automatically result in a valid analysis, especially when the theory and the analysis occupy two different realms of thought. There is always the possibility that a theory, supported with and verified by any number of rational means, is not universally applicable. To put it another way: the rules of one system may be inapplicable or irrelevant to another system.²²

This is of critical importance when considering the use of positivistic thought as a basis for music analysis. Reconsider this passage from A. J. Ayer:

... the propositions of philosophy are not factual, but linguistic in character—that is, they do not describe the behavior of physical, or even mental, objects; they express definitions, or the formal consequences of definitions. Accordingly, we may say that philosophy is a department of logic. For we shall see that the characteristic mark of a purely logical enquiry is that it is concerned with the formal consequences of our definitions and not with questions of empirical fact.²³

This quotation clearly reveals an aspect of philosophical analysis that may conflict with music analysis. In positivistic philosophy, there was a tendency to dwell in the realm of abstract entities; though originally an empirical approach by design, the emphasis placed on formal logic allowed these philosophers to handle logical entities as readily, if not more so, than the objects of perception. Eventually there was, as Ayer stated, little concern for the "empirical facts".²⁴ This logical thrust was

20 Babbitt. *Concepts*, 1972, p. 4.

21 Babbitt is by no means the only one to profess formal or symbolic logic as the ideal basis for musical theory; see, for example, Lennart Aqvist. "Music from a Set-Theoretical Point of View", *Interface*, 2 (1973), pp. 1-22; Boretz. "Meta-Variations" (1969); Allen Forte. "Context and Continuity in an Atonal Work". *Perspectives of New Music*, 1/2 (1963), pp. 72-82; Kassler. 1963; and Rahn, *Logic*, 1979. As Robert Morgan says: "The role of theory, then, was to define the relevant conventions and, at least for many theorists, to show that they were rooted in acoustical laws and thus explicable in more or less rigorous, scientific terms. Individual analyses were thus played off against, and

supported by a larger background of shared musical beliefs and assumptions that were ultimately reducible to explanations of an essentially technical-musicogrammatical-nature". Morgan, 1977, p. 36.

22 As Leonard Meyer claims: "I do not mean to deny the existence of universals, or to minimize their significance for music theory. But the universals central for music theory are not those of physics or acoustics, but those of human psychology ..." Leonard B. Meyer, "A Pride of Prejudices: Or, Delight in Diversity", *Music Theory Spectrum*, 13/2 (1991), p. 250.

23 Ayer. *Language, Truth & Logic*, 2nd edn. (New York: Dover, 1952), p. 57. Or, as Frege says. "What is objective in it [space] is what is subject to laws, what can be conceived and judged, what is expressible in words. What is purely intuitable is not communicable". Frege. *Foundation*, 1980. p. 35.

24 One can see the beginnings of this approach quite clearly in Frege. See Reinhardt Grossman.

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simultaneously linked with the analysis of language, for reasons that have already been outlined. The result is a form of analysis remarkably distant from any empirical entities, so much so that the existence of such entities is of negligible importance.²⁵ To cite Russell again:

The whole question of what particulars you actually find in the real world is a purely empirical one which does not interest the logician as such. The logician as such never gives instances, because it is one of the tests of a logical proposition that you need not know anything whatsoever about the real world in order to understand it.²⁶

Such steps proved invaluable in the development of advanced logic.²⁷ But is such an approach valuable to music analysis? In many situations the music analyst is concerned with the understanding of a particular object, the musical composition. Obviously a competent analyst will take into consideration those stylistic characteristics that the composition may share with similar works. But ideally a successful analysis will highlight those very features that are unique to the composition.²⁸ Formal truths or systems that are generically applicable to a class of compositions will offer a starting-point for the analyst but will ultimately shed little light on the particularity of the work. To place too much emphasis on abstract formal properties tends to make the specific facts of secondary importance in the analytic process. In the case of linguistic analysis, the terms of the propositions are of central importance—not the objects to which such terms might refer.²⁹ For many of those philosophers who were seeking the logical form of language the terms within a proposition could be interchanged with others so long as the logical form and truth-value remained intact.³⁰

As we have seen, positivist philosophers usually replaced empirical objects with logical forms, and these forms are themselves void of particulars. What kind of impact might this have on music analysis? Are we to consider logically derived formal truths and structures to be equivalent to the formal "truths" of empirical, musical experience? It is tempting to assume that since logical truths are universal, then logical form is likewise universal. This is by no means a necessary condition,

Reflections on Frege's Philosophy (Evanston: Northwestern University Press, 1969), p. 83; Sluga, 1980. pp. 117-121.

25 "... [Frege] holds that in so far as we use proper names, we intend to refer to such individual objects, and whether or not they are actually present does not invalidate the intentions of the language users as such". Robert Sternfeld, *Frege's Logical Theory* (Carbondale: Southern Illinois University Press, 1969). p- 22.

26 Bertrand Russell, "The Philosophy of Logical Atomism", *Logic and Knowledge* (London: Unwin Hyman, 1956), p. 199. At another point Russell claims: "... as soon as the definition is found, it becomes wholly unnecessary to the reasoning to remember the actual object defined, since only concepts are relevant to our deductions". Russell, *Principles*, 1937, p. 63.

27 ". . . Frege's quantificational logic, I believe, reveals the logical structure of the world because it has no room for substances". Grossman. 1969. p. 83.

28 Many philosophers and music theorists are aware of this distinction. For example, Frege notes that: "Astronomy is concerned, not with ideas of the planets, but with the planets themselves, and by the same token the objects of arithmetic are not ideas either". Frege, *Foundations*, 1980, p. 37. Or, as Morgan says: ". . . analysis is closely tied to—indeed, to a large extent determined by—the object toward which it is directed". Morgan. 1977. p. 35.

29 "In logical syntax the meaning of a sign should never play a role. It must be possible to establish logical syntax without mentioning the meaning of a sign: only the description of expressions may be supposed". Ludwig Wittgenstein, *Tractatus Logico-Philosophicus*, trans. D. F. Pears and B. F. Guinness (London: Routledge, 1988), 3.33.

30 ". . . Frege's position is clear: logical analysis does not require that the definitions given strictly preserve the senses of the defined expressions". Dummett, *Interpretation*, 1981, p. 259.

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however. Though the early Wittgenstein argued that the structure of language reflects the logical structure of the world (an argument that he himself had difficulty with later), no such argument has been formulated for music. Most concepts of musical structure actually lean the other way: the emphasis is on dramatic, organic or purely self-referential forms. For this reason the search for logical structures in musical compositions may be misguided, for it is possible that such structures do not even exist.

On the other hand, to say that no logical structure can be found in art-works would be dogmatic and easily shown to be untrue. Because of the abstract nature of the subject, logical forms can be found in almost any object or process. From geometric shapes in paintings to balanced phrasing or symmetrical pitch collections in music, there are numerous characteristics that can be shown to manifest logical structure in some way. Yet to locate such an abstract and omnipresent structure in a musical composition may be of limited importance. To identify something that is not unique to the object of analysis, which in fact is universally present, seems to offer little insight into the particularity of the object. And uniqueness is at some level of primary concern in the process of analysis. If an art-work possesses a universal logical form, what is the difference between the art-work and any other objects that are logically structured? If there is a difference, then it would seem reasonable to seek out and examine such a difference and not to focus solely on that which is shared by many other artistic and non-artistic objects. The recognition of a universal principle of structure is at best a first step in the process of analysis.

Many philosophers were relatively unconcerned with this failure to distinguish between existent particulars and logical universals.³¹ As we have seen, the very question of the existence of particulars is often bypassed in favour of abstract structural analysis. This raises another concern: namely, whether such a non-experiential foundation would be valuable to an enquiry that concerns itself almost exclusively with perceptible objects, namely art-works.³² To risk a truism: at some level analysis should be concerned with perception. The theorist may be concerned with the question of perception as a whole, including acoustical, physiological and psychological considerations, but the analyst is concerned with the perception of a single work. Ultimately it is the perceptual experience of a particular work that analysis seeks to describe, explain or augment in some way. But we are forced to conclude, given some of the foregoing quotations, that perception plays no role in formal logic. In the passage cited from *Logic and Knowledge*, Russell stated that "it is one of the tests of a logical proposition that you need not know anything whatsoever about the real world in order to understand it". Logical structures do not

31 "Logical formalism as advocated by Kant and Frege holds that one can separate the formal features of human thought from its specific contents and that logic (and mathematics) deals only with form". Sluga. 1980. p. 62; or. "Now a little reflection will lead us to the result that there is no fundamental difference between a universal sentence and a particular sentence with regard to verifiability but only a difference in degree". Rudolf Carnap. "Testability and Meaning" in *Classics of Analytic Philosophy*, ed. R. Ammerman (New York: McGraw-Hill. 1965). p. 134.

32 It may be, as Regner points out. that the system ends up feeding on itself: "One gets the impression, in a way, 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". Eric Regner. "On Allen Forte's Theory of Chords", *Perspectives of New Music*, 13/1 (1974), p. 211.

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need perception for their verification and lead most logical investigations to distance themselves from purely empirical matters. As Oswald Hanfling notes:

... Carnap had spoken ... of observation-statements as being about "experience or phenomena, i.e. the simplest states of which knowledge can be had". When we read his translation of this into the formal mode, we find a remarkable transformation. Gone are the references to experience and phenomena (these being items other than words). Instead of characterizing the basic statements in these terms, we are to say merely that they are "statements needing no justification and serving as the foundation for all the remaining statements of science" . . . Thus the crucial contact with experience is broken. The demands of empiricism are to be met by tracing logical relations between statements, and nothing more.³³

The question of whether such logical entities can be perceived is not even an issue at this point, for logical investigations are independent of perception. Consider a similar point:

The basic consideration which lay behind Russell's theory of descriptions and behind the atomism of the *Tractatus* is this. Whether a sentence has meaning or not is a matter of logic. Whether particular things exist or not is a matter of experience. But logic is prior to all experience. Therefore whether a sentence has meaning or not can never depend on whether particular things exist. The three premises of this argument are plausible, and were and are widely held.³⁴

Logic, then, is autonomous from and prior to experience or, in this case, to perception. This does not mean, however, that the laws of logic are the same as the laws of perception or even that there are characteristics shared by the two. Regardless of the cognitive processes that may accompany the aesthetic experience, music is first and foremost a matter of perception. It is in the very nature of a musical composition that it be heard; it would seem preferable, then, that music analysis aligns itself with a theoretical foundation in which perception played a more substantial role.³⁵ More generally, it is doubtful whether a pre-perceptual or non-perceptual system of truths would be of much benefit in understanding any aesthetic experience. At this point it is almost irrelevant whether there are any inconsistencies within the systems of atonal theory being investigated; they can be internally sound and logically defensible yet still be of limited value to the analyst because of the apparently tenuous link between the system employed and the object of analysis.³⁶

We now have before us the outlines of a philosophical system that would appear to be lacking in particulars, of dubious relation to empirical facts and independent of perception. As was noted above, the danger in 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

33 Oswald Hanfling, *Logical Positivism* (New York: Columbia University Press, 1981). pp- 78-79.

34 Anthony Kenny, *Wittgenstein* (Cambridge: Harvard University Press), p. 78. Currie notes that for Frege mathematical truths did not depend on empirical confirmation: on the contrary, mathematical truths must hold a priori for empirical confirmation to occur. Currie, 1982. pp. 147-8, 152.

35 As Adorno says: "Analysis is thus concerned with structure, with structural problems, and finally, with structural listening". Theodor W. Adorno, "On the Problem of Musical Analysis", *Musical Analysis*, 1/2 (1982), p. 173.

36 In a similar fashion Beach noted: "The potentialities of [the twelve-tone] system have been revealed to us largely through the efforts of Milton Babbitt. But Babbitt's definition of series procedures, unlike Schenker's theories of tonal structure, is, for the most part, abstract. His is a description of a system, not of musical structure". David Beach, "Pitch Structure and the Analytic Process in Atonal Music: An Interpretation of the Theory of Sets", *Music Theory Spectrum*, 1 (1979), p. 7.

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its universality, it will always find a structure. Unfortunately, it is likely that structures that are so general are of limited use in the realm of the particular. This difficulty is compounded when the theoretical system in question is treated as an all-inclusive process capable of explaining the structure of a work entirely.³⁷ The result for music analysis can be a system of relationships so vast as to make them potentially useless when we attempt to understand a single composition. Even worse, the application of a universalizing, non-perceptual method may end up associating perceptibly dissimilar events or, in our case, *musically* different events.

As Taruskin has said: For pc 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 musical entity with such a universe yields an inexhaustible quarry of "true facts" but no criterion of relevance.³⁸

It is clear now that philosophical analysis differs substantially from other types of analysis, especially aesthetic analysis. Philosophical analysis is not concerned with the explication of an object: it is a process of formal verification—more specifically, the evaluation of propositions to determine their meaningfulness and truth content.³⁹ For those philosophers who were seeking to "clean up" philosophy, to dispense with meaningless claims and futile pursuits, such an approach could be devastatingly effective. Does this mean, however, that such an approach is a likely model for music analysis? Only if one is willing to assume a new definition for music analysis, especially given the many ways in which logic seems to be an unsatisfactory basis for music analysis. The avoidance of particulars creates a system so abstract as to render it almost impotent when it comes to the investigation of individual cases; there is a tendency to rely too heavily on forms and structures derived from logic—a move that threatens to diminish any interest in specifically musical aspects; and the non-perceptual nature of logic distances such an approach from the very heart of the musical experience. It is this, the potentially non-musical nature of positivistic music theory, that is the most pressing concern. For these reasons many systems of atonal theory, by themselves, may provide unsatisfactory foundations for music analysis. It is quite likely that the discoveries that such theories provide may prove beneficial when combined with other analytic considerations. But, by themselves, these theories seem incapable of addressing the very issues that are the central concern of musicians.

37 "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". George Perle, *The Listening Composer* (Berkeley: University of California Press, 1990). p. 67. 38 Richard Taruskin. "Reply to van den Toorn". *In Theory Only*, 10/3 (1987). p. 57. He continues: "As long as no such criterion has been established, whether inferentially or historically the endless stream of ostensible relations stemming from the pc 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 (hence the universal 'compatibility'). Nor is it really so innocuous as I may be making it seem, since in its anodyne effect (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".

39 "In short, he [Russell] uses analysis as a method of justification". A. J. Ayer, *Bertrand Russell* (Chicago: University of Chicago Press, 1972), p. 35. Or, as Carnap says, "This formulation thereby helped, on the one hand, to analyze the factual content of scientific sentences, and, on the other hand, to show that the sentences of trans-empirical metaphysics have no cognitive meaning". Carnap, *Testability*, 1965. p. 131.