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The State of Research in Twelve-Tone and Atonal Theory

Andrew Mead

The study of twelve-tone and atonal music is a young discipline, because its subject, as music history goes, is a very recent arrival upon the scene. We measure our tradition in decades, rather than centuries, and, various spurious obituary notices to the contrary, twelve-tone composition is still a vital, if not particularly audible, part of today's musical culture. Thus, our subject is not easily subjugated, and its constant expansion defies circumscription.

However, the very vitality of our subject has itself spawned a lively and diverse body of thought about twelve-tone and atonal music, in large part because so many of the participants wear two hats. We need only remember that two of the brightest lights of the twelve-tone theoretical firmament are Arnold Schoenberg and Milton Babbitt to remind us that many of the proponents of twelve-tone and atonal music are themselves practitioners. The result is a wealth of engaging musical thought that ranges from considerations of the most general issues to the equivalent of a proud parent exhibiting photographs of its most recent offspring.

In trying to offer an overview of the current state of research in twelve-tone and atonal theory I can only provide a personal perspective, colored by my affinities and preoccupations as a general proponent of this music, and admittedly infected by my own parental biases and enthusiasms. Nevertheless, I hope the

following notes will provide a scaffold from which to view the growing edifice, bearing in mind that scaffolds are built to be dismantled when they are no longer useful.

I find it useful to divide twelve-tone and atonal theory into four broad areas of concern. Most writings on twelve-tone and atonal music tend to concentrate on fewer than all of them, but in most cases tacit assumptions about the others may be inferred. These four areas will give us a way of viewing the wealth of articles that have appeared over the past several years, and will also allow me to highlight some of the issues addressed.

My first area of concern is the parsing of the musical surface, the basic process of grouping events as intelligible entities. As we shall observe later, this is by no means a simple problem, although it is possible to get a great deal of analytical mileage by using common sense. The critical importance of considering surface grouping structures is brought out in a number of writings in explicit ways. William Benjamin is assiduous in this regard in "Ideas of Order in Motivic Music," as is Stephen Peles in "Interpretations of Sets in Multiple Dimensions: Notes on the Second Movement of Arnold Schoenberg's String Quartet No. 3." Interpretation of the musical surface has been a central concern of Christopher Hasty, who most recently articulated it in his presentation at the 1986 SMT conference, "Material and Form in Webern's Twelve-Tone Music," but whose other writ-

ings also concern themselves with the issue. Martin Brody's paper, "Sensibility Defined: Set Projection in Stefan Wolpe's *FORM for Piano*," is also worth noting for its attention to surface articulation of musical materials.

Theories of musical contour have been developed in two articles, Michael Friedmann's "A Methodology for the Discussion of Contour: Its Application to Schoenberg's Music" and Elizabeth West Marvin and Paul Laprade's "Relating Musical Contours: Extensions of a Theory for Contour."

Two forthcoming works demonstrate the wealth of insight that may be derived from extremely close readings of the musical surface, combined with sophisticated syntactical understanding; they are Bruce Samet's book, *Hearing Aggregates*, and Joseph Dubiel's "Three Essays on Milton Babbitt."

Most of the articles listed in the bibliography, particularly those more analytically oriented articles discussed by Martha Hyde, display a concern that those entities identified for the purposes of analysis bear "believable" means of projection on the musical surface. But as we shall see, our notions of naive common-sensical groupings may have to be refined because of certain other factors found in the other areas of concern.

The most immediate question raised by the first area of concern is: What can be abstracted, particularly in the pitch domain, from those events grouped in the musical surface? This question leads to my second area of concern, the taxonomy of pitch class collections and twelve-tone rows. This, the naming and classifying of parts, underlies much of the writing in the field of twelve-tone and atonal theory, and is of crucial importance to its development. The seminal work in this area (but not limited to it) is, of course, Allen Forte's *The Structure of Atonal Music*, but this portion of our subject ranges as far back as Ernst Bacon's youthful book, *Our Musical Idiom*, and continues to raise interesting and provocative questions.

A central issue of taxonomy is the question of criteria used to categorize collections of pitch classes. Forte's work has established equivalence classes of pitch-class collections based on

transposition and inversion as the norm, but other writers have invoked additional criteria for equivalence relations, including Daniel Starr in "Sets, Invariance, and Partitions" and Robert Morris in "Set Groups, Complementation, and Mappings Among Pitch-Class Sets."

An integral part of taxonomy is the investigation of properties of collections, and a number of writings provide useful tools to this end. In addition to the works I have mentioned, these include Bo Alphonse's "The Invariance Matrix," John Clough's "Use of the Exclusion Relation to Profile Pitch-Class Sets," David Lewin's "Forte's Interval Vector, My Interval Function, and Regener's Common-Note Function," and John Rahn's book, *Basic Atonal Theory*.

Twelve-tone taxonomy includes the description of basic transformations and properties of twelve-tone rows. This is a part of most twelve-tone theoretical writing, and there are a number of articles describing ways of generating rows with interesting characteristics. They include Stefan Bauer-Mengelberg and Melvin Ferentz's "On Eleven-Interval Twelve-Tone Rows." Michael Stanfield's two-part "Some Exchange Operations in Twelve-Tone Theory," and Robert Morris's "Set-Type Saturation Among Twelve-Tone Rows" and "On the Generation of Multiple-Order-Function Twelve-Tone Rows." Milton Babbitt's seminal article, "Twelve-Tone Invariants as Compositional Determinants," while containing much else, is fundamental to the study of twelve-tone taxonomy. A crucial point of Babbitt's article is the recognition that twelve-tone rows array the twelve unordered pitch classes against twelve unpitched order numbers, both domains having identical abstract properties, so that virtually all of the taxonomic properties of unordered pitch-class collection theory are directly incorporated in twelve-tone taxonomy. Donald Martino's "The Source Set and its Aggregate Formations" not only outlines pitch-class collections and their relations but investigates the question of ways collections may be conjoined discretely to form aggregates, another dramatization of the deep

connection between atonal theory and twelve-tone theory.

Intimately related to questions of equivalence are questions of similarity, leading to a number of fascinating considerations of similarity among pitch-class collections of like and different classes. These include Christopher Lewis's "Tonal Focus in Atonal Music," as well as David Lewin's "Some New Constructs Involving Abstract PC Sets and Probabilistic Applications," Robert Morris's "A Similarity Index for Pitch Class Sets," and John Rahn's "Relating Sets." These last three originated in a session of papers at the first national conference of the Society for Music Theory. Richmond Browne has also recently presented a new model for similarity called distribution sets, and his work should appear shortly.

As Martha Hyde suggests, however, questions of similarity presuppose context and function. Different contextual criteria can lead to significantly different sorts of similarity relationships. Tonal music richly exploits the possibilities of dissimilar structures functioning similarly, or intervallically identical structures (to within enharmonic equivalence) functioning in markedly different ways. In such cases, we are able to invoke different sets of criteria to account for the similarities and differences, and tonal music makes much of our abilities to do so simultaneously.

In atonal and twelve-tone contexts we can also recognize a wealth of different criteria for creating sometimes contradictory similarity conditions, based on such things as combinational and aggregate-forming properties of collections, intervallic similarities, or similar distributions either of subsets within collections or of members of a collection class or classes within the aggregate.

Understanding the ways various contexts may operate in a composition comes within my third area of concern, the syntaxes of twelve-tone and atonal music. This is a broad area, covering both relations that create local connections, as well as those strategies that articulate large-scale form, both in twelve-tone music and in atonal music. The area is further subdivided

into those writings that seek to explicate particular compositions or groups of works and those writings that take a more speculative theoretical view. Martha Hyde discusses a number of the former; some examples of the latter include Milton Babbitt's "Set Structure as a Compositional Determinant" and "Twelve-Tone Rhythmic Structure and the Electronic Medium," Philip Batstone's "Multiple Order Functions in Twelve-Tone Music," Michael Kassler's "Toward a Theory that Is the Twelve-Note-Class System," Walter O'Connell's little-known but fascinating "Tone Spaces," which also contains some interesting and unusual taxonomic points, and Daniel Starr's "Derivation and Polyphony" and his noted collaboration with Robert Morris, "A General Theory of Combinatoriality and the Aggregate." A recent addition is David Kowalski's "The Construction and Use of Self-Deriving Arrays."

The works I have mentioned so far are all related to twelve-tone syntax, but there are a number of articles dealing with the thorny question of syntax in more contextually composed music. Martha Hyde mentions a number of analytically-oriented articles dealing with this question. More purely theoretically-oriented articles include Alan Chapman's "Some Intervallic Aspects of Pitch-Class Set Relations" and Robert Morris's "Combinatoriality without the Aggregate," which employs notions more usually associated with twelve-tone music to suggest possible syntaxes for contextual music that is not aggregate based. A recent addition to this area is John Roeder's "A Geometric Representation of Pitch-Class Series," which contains valuable insights into both taxonomy and syntax of contextual music.

Of critical importance in the area of atonal and twelve-tone syntax are two books: David Lewin's *Generalized Musical Intervals and Transformations* and Robert Morris's *Composition with Pitch-Class: A Theory of Compositional Design*. Both of these books employ group theory to articulate and illustrate a wide variety of musical syntactic concerns—in the case of

David Lewin's work ranging over a wide range of musical styles, not limited to the music of this century. Another useful and interesting book is the highly idiosyncratic *Words about Music*, a series of transcribed lectures and seminars of Milton Babbitt, edited by Stephen Dembski and Joseph Straus.

My fourth area of concern is the question of the fundamental interpretation of perceptual distinctions underlying twelve-tone and atonal syntaxes. For any syntax to be vivid, it must be based on believable perceptual criteria. We must be able to process the music in such a way that the degrees of differentiation controlled by the syntax are readily heard and understood. Understanding a syntax requires us to understand its perceptual presumptions, the various perceptual distinctions it employs to differentiate its grammatical entities. The association of perceptual distinction and grammatical function can vary wildly from syntax to syntax, and two syntaxes may assign contradictory functions to the same perceptual distinction. This area of concern is the least well represented in the literature, but I feel it is of crucial importance to the whole subject of twelve-tone and atonal theory.

What seems to be emerging, articulated variously in a number of forthcoming articles and adumbrated in virtually all of Milton Babbitt's writings, is a fundamental perceptual difference between music based on tonal analogues and metaphors and music based on relations among partitions of aggregates. Several presentations from previous SMT conferences illustrate successful modes of construal of certain atonal compositions based on extensions of tonal listening strategies, including William Benjamin's "Harmony in Radical European Music (1905–1920)" (Philadelphia, 1984) and Howard Cinnamon's "Tonal Elements and Unfolding Non-Triadic Sonorities in the Second of Schoenberg's *Drei Klavierstücke*, Op. 11" (Bloomington, 1986).

Aggregate-based music, on the other hand, seems to require very different interpretations of perceptual distinctions in or-

der to make its transformations vivid and open to a listener's understanding. The fundamental difference of construal is addressed in Milton Babbitt's "Since Schoenberg," and the issues it raises inform the analytical work of Dubiel, Peles, Samet, and Hyde, as well as Stephen Mackey's "The Thirteenth Note."

I feel that the question of twelve-tone listening strategies, related as it is to general questions of cognition and perception, will be the focus of stimulating debate in the future. Questions about the cognitive base of the twelve-tone system have already been raised by Fred Lerdahl in "Cognitive Constraints on Compositional Systems," and Carol Krumhansl, with Gregory Sandell and Desmond Sergeant, has undertaken to test for certain perceptual abilities, as described in "The Perception of Tone Hierarchies and Mirror Forms in Twelve-Tone Serial Music." Both of these articles, however, employ theories of twelve-tone syntax that are highly open to question, underscoring the continuing need to investigate the issue of twelve-tone perception.

Each of our four areas of concern affects the others, and any development in one area is bound to have implications extending through the whole edifice. The continued growth of twelve-tone and atonal theory depends on our sensitivity to such implications. For example, the perceptual bases of twelve-tone and atonal music cannot help but have a profound effect on our considerations of the surface parsing of the music, as the syntax itself imposes certain criteria for grouping on the musical surface. Our basic assumptions of how we take in the musical surface will be constantly refreshed by our ways of thinking about the implications of what we hear. Thus our fourth area of concern has brought us back to where we started, the heard surface of the music. But it is good to be reminded that this is first and last music to be heard, and to realize that the beginning and the end of the task for each of us who cares is to listen.

BIBLIOGRAPHY

Although some significant articles have had to be omitted due to the limitations of space, we have sought to compensate for this in a number of ways. Included below are a number of anthologies containing several important articles otherwise not listed. Both the Vander Weg bibliography and the bibliography in John Rahn's *Basic Atonal Theory* contain extensive lists of additional readings, as do the notes of many of the writings found below. In the case of those theorists whose later writings subsume or supersede their earlier work, we have cited only their most complete presentation. In general, we have avoided listing reviews, commentaries, or responses, despite the fact that they frequently contain significant contributions to the field.

- Alphonse, Bo Harry. "The Invariance Matrix." Ph.D. dissertation, Yale University, 1974.
- Antokoletz, Elliott. *The Music of Béla Bartók*. Berkeley and Los Angeles: University of California Press, 1984.
- Babbitt, Milton. "Set Structure as a Compositional Determinant." *Journal of Music Theory* 5 (1961):72–74. Reprinted in *Perspectives on Contemporary Music Theory*, edited by Benjamin Boretz and Edward T. Cone (New York: Norton, 1972), 129–174.
- . "Since Schoenberg." *Perspectives of New Music* 12/1–2 (1973–74):3–28.
- . "Twelve-Tone Invariants as Compositional Determinants." *Musical Quarterly* 46 (1960):246–259. Reprinted in *Problems of Modern Music*, edited by Paul Henry Lang (New York: Norton, 1962), 108–121.
- . "Twelve-Tone Rhythmic Structure and the Electronic Medium." *Perspectives of New Music* 1/1 (1962):49–79. Reprinted in *Perspectives on Contemporary Music Theory*, 148–179.

- . *Words about Music*. Edited by Stephen Dembski and Joseph N. Straus. Madison: University of Wisconsin Press, 1987.
- Bacon, Ernst Lecher. *Our Musical Idiom*. Chicago: Open Court, 1917.
- Baker, James M. "Coherence in Webern's Six Pieces for Orchestra, Op. 6." *Music Theory Spectrum* 4 (1982):1–27.
- . *The Music of Alexander Scriabin*. New Haven and London: Yale University Press, 1986.
- Batstone, Philip Norman. "Multiple Order Functions in Twelve-Tone Music." *Perspectives of New Music* 10/2 (1972):60–71; 11/1 (1972):92–111.
- Bauer-Mengelberg, Stefan, and Ferentz, Melvin. "On Eleven-Interval Twelve-Tone Rows." *Perspectives of New Music* 3/2 (1965):93–103.
- Beach, David W. "Pitch Structure and the Analytic Process in Atonal Music: An Interpretation of the Theory of Sets." *Music Theory Spectrum* 1 (1979):7–22.
- Benjamin, William E. "Ideas of Order in Motivic Music." *Music Theory Spectrum* 1 (1979):23–34.
- Bernard, Jonathan W. *The Music of Edgard Varèse*. New Haven and London: Yale University Press, 1987.
- . "Pitch/Register in the Music of Edgard Varèse." *Music Theory Spectrum* 3 (1981):1–25.
- . "Spatial Sets in Recent Music of Elliott Carter." *Music Analysis* 2 (1983):5–34.
- Berry, Wallace. "Symmetrical Interval Sets and Derivative Pitch Materials in Bartók's String Quartet No. 3." *Perspectives of New Music* 18/1–2 (1979–80):287–380.
- Boretz, Benjamin, and Cone, Edward T., eds. *Perspectives on Contemporary Music Theory*. New York: Norton, 1972.
- . *Perspectives on Schoenberg and Stravinsky*. New York: Norton, 1972.

- Brinkman, Alexander R. "A Binomial Representation of Pitch for Computer Processing of Musical Data." *Music Theory Spectrum* 8 (1986):44–57.
- Brody, Martin. "Sensibility Defined: Set Projection in Stefan Wolpe's *FORM for piano*." *Perspectives of New Music* 15/2 (1977):3–22.
- Chapman, Alan. "Some Intervallic Aspects of Pitch-Class Set Relations." *Journal of Music Theory* 25 (1981):275–290.
- Chrisman, Richard. "Anton Webern's *Six Bagatelles for String Quartet*, Op. 9: The Unfolding of Intervallic Successions." *Journal of Music Theory* 23 (1979):81–122.
- Clough, John. "Diatonic Interval Sets and Transformational Structures." *Perspectives of New Music* 18/1–2 (1979–80):461–482.
- . "Use of the Exclusion Relation to Profile Pitch-Class Sets." *Journal of Music Theory* 27 (1983):181–201.
- Clough, John, and Myerson, Gerald. "Variety and Multiplicity in Diatonic Systems." *Journal of Music Theory* 29 (1985):249–270.
- DeLio, Thomas. "Iannis Xenakis's *Nomos Alpha*: The Dialectics of Structure and Materials." *Journal of Music Theory* 24 (1980):63–96.
- Derby, Richard. "Carter's *Duo for Violin and Piano*." *Perspectives of New Music* 20/1–2 (1981–82):149–168.
- Forte, Allen. "Aspects of Rhythm in Webern's Atonal Music." *Music Theory Spectrum* 2 (1980):90–109.
- . "Tonality, Symbol, and Structural Levels in Berg's *Wozzeck*." *Musical Quarterly* 71 (1985):474–499.
- . *The Structure of Atonal Music*. New Haven and London: Yale University Press, 1973.
- Friedmann, Michael L. "A Methodology for the Discussion of Contour: Its Application to Schoenberg's Music." *Journal of Music Theory* 29 (1985):223–248.
- Gauldin, Robert. "Pitch Structure in the Second Movement of Webern's Concerto, Op. 24." *In Theory Only* 2/10 (1977):8–22.
- Gilbert, Steven E. "Gershwin's Art of Counterpoint." *Musical Quarterly* 70 (1984):423–456.
- Gingerich, Lora L. "A Technique for Melodic Motivic Analysis in the Music of Charles Ives." *Music Theory Spectrum* 8 (1986):75–93.
- Haimo, Ethan, and Johnson, Paul. "Isomorphic Partitioning and Schoenberg's Fourth String Quartet." *Journal of Music Theory* 28 (1984):47–72.
- Hall, Patricia. "The Progress of a Method: Berg's Tone Rows for *Lulu*." *Musical Quarterly* 71 (1985):500–519.
- Hasty, Christopher F. "On the Problem of Succession and Continuity in Twentieth-Century Music." *Music Theory Spectrum* 8 (1986):58–74.
- . "Phrase Formation in Post-Tonal Music." *Journal of Music Theory* 28 (1984):167–190.
- . "Segmentation and Process in Post-Tonal Music." *Music Theory Spectrum* 3 (1981):54–73.
- Howe, Hubert S. "Some Combinational Properties of Pitch Structures." *Perspectives of New Music* 4/1 (1965):45–61.
- Hush, David. "Asynordinate Twelve-Tone Structures: Milton Babbitt's *Composition for Twelve Instruments*." *Perspectives of New Music* 21/1–2 (1982–83):152–208; 22/1–2 (1983–84):103–116.
- Hyde, Martha M. "Musical Form and the Development of Schoenberg's Twelve-Tone Method." *Journal of Music Theory* 29 (1985):85–143.
- . "The Roots of Form in Schoenberg's Sketches." *Journal of Music Theory* 24 (1980):1–36.
- . *Schoenberg's Twelve-Tone Harmony: The Suite Op. 29 and the Compositional Sketches*. Ann Arbor: UMI Research Press, 1982.
- . "A Theory of Twelve-Tone Meter." *Music Theory Spectrum* 6 (1984):14–51.
- Joseph, Charles M. "Structural Coherence in Stravinsky's *Piano-Rag-Music*." *Music Theory Spectrum* 4 (1982):76–91.

- Kabbash, Paul. "Aggregate-Derived Symmetry in Webern's Early Works." *Journal of Music Theory* 28 (1984):225–250.
- Kassler, Michael. "Toward a Theory That is the Twelve-Note-Class System." *Perspectives of New Music* 5/2 (1967):1–80.
- Kohl, Jerome. "The Evolution of Macro- and Micro-Time Relations in Stockhausen's Recent Music." *Perspectives of New Music* 22/1–2 (1983–84):147–185.
- Kowalski, David. "The Construction and Use of Self-Deriving Arrays." *Perspectives of New Music* 25/1–2 (1987):286–361.
- Kramer, Jonathan D. "Moment Form in Twentieth-Century Music." *Musical Quarterly* 64 (1978):177–194.
- . *The Time of Music*. New York: Schirmer Books, 1988.
- Krumhansl, Carol L.; Sandell, Gregory J.; and Sergeant, Desmond C. "The Perception of Tone Hierarchies and Mirror Forms in Twelve-Tone Serial Music." *Music Perception* 5 (1987):31–77.
- Lang, Paul Henry, ed. *Problems of Modern Music*. New York: Norton, 1962.
- Lansky, Paul. "Pitch-Class Consciousness." *Perspectives of New Music* 13/2 (1975):30–56.
- Lerdahl, Fred. "Cognitive Constraints on Compositional Systems." In *Generative Processes in Music*, edited by John A. Sloboda (Oxford: Clarendon Press, 1988), 231–259.
- Lewin, David. "A Response to a Response: On PC Set Relatedness." *Perspectives of New Music* 18/1–2 (1979–80):498–502.
- . "Forte's Interval Vector, My Interval Function, and Regener's Common-Note Function." *Journal of Music Theory* 21 (1977):194–237.
- . *Generalized Musical Intervals and Transformations*. New Haven and London: Yale University Press, 1987.
- . "Some New Constructs Involving Abstract PC Sets, and Probabilistic Applications." *Perspectives of New Music* 18/1–2 (1979–80):433–444.
- . "Vocal Meter in Schoenberg's Atonal Music, With a Note on a Serial *Hauptstimme*." In *Theory Only* 6/4 (1982):12–36.
- Lewis, Christopher. "Tonal Focus in Atonal Music: Berg's Op. 5, No. 3." *Music Theory Spectrum* 3 (1981):84–97.
- Lord, Charles H. "Intervallc Similarity Relations in Atonal Set Analysis." *Journal of Music Theory* 25 (1981):91–111.
- Mackey, Stephen. "The Thirteenth Note." Ph.D. dissertation, Brandeis University, 1985.
- Mancini, David L. "Twelve-Tone Polarity in Late Works of Luigi Dallapiccola." *Journal of Music Theory* 30 (1986):203–224.
- Martino, Donald. "The Source Set and its Aggregate Formations." *Journal of Music Theory* 5 (1961):224–273.
- Marvin, Elizabeth West. "The Structural Role of Complementation in Webern's *Orchestra Pieces* (1913)." *Music Theory Spectrum* 5 (1983):76–88.
- Marvin, Elizabeth West, and Laprade, Paul A. "Relating Musical Contours: Extensions of a Theory for Contour." *Journal of Music Theory* 31 (1987):225–267.
- McNamee, Ann K. "Bitonality, Mode, and Interval in the Music of Karol Szymanowski." *Journal of Music Theory* 29 (1985):61–84.
- Mead, Andrew. "Detail and the Array in Milton Babbitt's *My Complements to Roger*." *Music Theory Spectrum* 5 (1983):89–109.
- . "Large-Scale Strategy in Arnold Schoenberg's Twelve-Tone Music." *Perspectives of New Music* 24/1 (1985):120–157.
- . "Some Implications of the Pitch Class/Order Number Isomorphism Inherent in the Twelve-Tone System: Part One." *Perspectives of New Music* 26/2 (1988):96–163.
- . "'Tonal' Forms in Arnold Schoenberg's Twelve-Tone Music." *Music Theory Spectrum* 9 (1987):67–92.
- Morris, Robert D. "Combinatoriality Without the Aggregate." *Perspectives of New Music* 21/1–2 (1982–83):432–486.
- . *Composition with Pitch-Classes: A Theory of Compositional Design*. New Haven and London: Yale University Press, 1987.

- . “On the Generation of Multiple-Order-Function Twelve-Tone Rows.” *Journal of Music Theory* 21 (1977):238–262.
- . “Set Groups, Complementation, and Mappings Among Pitch-Class Sets.” *Journal of Music Theory* 26 (1982):101–144.
- . “Set-Type Saturation Among Twelve-Tone Rows.” *Perspectives of New Music* 22/1–2 (1983–84):187–217.
- . “A Similarity Index for Pitch-Class Sets.” *Perspectives of New Music* 18/1–2 (1979–80):445–460.
- Nattiez, Jean-Jacques. “Varèse’s *Density 21.5*: A Study in Semiological Analysis.” Translated by Anna Barry. *Music Analysis* 1 (1982):243–340. Response by Jonathan W. Bernard, *Music Analysis* 5 (1986):207–231.
- Neumeyer, David. *The Music of Paul Hindemith*. New Haven and London: Yale University Press, 1986.
- O’Connell, Walter. “Tone Spaces.” *Die Reihe* 8 (English ed., 1968):35–67.
- Parks, Richard S. “Pitch Organization in Debussy: Unordered Sets in *Brouillards*.” *Music Theory Spectrum* 2 (1980):119–134.
- . “Tonal Analogues as Atonal Resources and Their Relation to Form in Debussy’s Chromatic Etude.” *Journal of Music Theory* 29 (1985):33–60.
- Peles, Stephen. “Interpretations of Sets in Multiple Dimensions: Notes on the Second Movement of Arnold Schoenberg’s *String Quartet #3*.” *Perspectives of New Music* 22/1–2 (1983–84):303–352.
- Perle, George. *Serial Composition and Atonality: An Introduction to the Music of Schoenberg, Berg, and Webern*. 5th ed., rev. Berkeley and Los Angeles: University of California Press, 1981.
- . *Twelve-Tone Tonality*. Berkeley and Los Angeles: University of California Press, 1977.
- Rahn, Jay. “Evaluating Metrical Interpretations.” *Perspectives of New Music* 16/2 (1978):35–49.
- Rahn, John. *Basic Atonal Theory*. New York and London: Longman, 1980. Review by Robert D. Morris, *Music Theory Spectrum* 4 (1982):138–154.
- . “Relating Sets.” *Perspectives of New Music* 18/1–2 (1979–80):483–498.
- Roeder, John. “A Geometric Representation of Pitch-Class Series.” *Perspectives of New Music* 25/1–2 (1987):362–409.
- Rothstein, William. “Linear Structure in the Twelve-Tone System: An Analysis of Donald Martino’s *Pianississimo*.” *Journal of Music Theory* 24 (1980):129–165.
- Samet, Bruce. *Hearing Aggregates*. University Park, Pa.: Pennsylvania State University Press, 1987.
- Schmalfeldt, Janet. *Berg’s “Wozzeck”: Harmonic Language and Dramatic Design*. New Haven and London: Yale University Press, 1983.
- Slawson, Wayne. “The Color of Sound: A Theoretical Study in Musical Timbre.” *Music Theory Spectrum* 3 (1981):132–141.
- Stanfield, Michael. “Some Exchange Operations in Twelve-Tone Theory.” *Perspectives of New Music* 23/1 (1984):258–277; 24/1 (1985):72–95.
- Starr, Daniel. “Derivation and Polyphony.” *Perspectives of New Music* 23/1 (1984):180–257.
- . “Sets, Invariance, and Partitions.” *Journal of Music Theory* 22 (1978):1–42.
- Starr, Daniel, and Morris, Robert. “A General Theory of Combinatoriality and the Aggregate.” *Perspectives of New Music* 16/1 (1977):3–35; 16/2 (1978):50–84.
- Straus, Joseph. “A Principle of Voice Leading in the Music of Stravinsky.” *Music Theory Spectrum* 4 (1982):106–124.
- . “Recompositions by Schoenberg, Stravinsky, and Webern.” *Musical Quarterly* 72 (1986):301–328.
- . “Stravinsky’s Tonal Axis.” *Journal of Music Theory* 26 (1982):261–290.
- Swift, Richard. “A Tonal Analog: The Tone-Centered Music of George Perle.” *Perspectives of New Music* 21/1–2 (1982–83):257–284.
- van den Toorn, Pieter C. *The Music of Igor Stravinsky*. New

- Haven and London: Yale University Press, 1983. Review by William W. Austin, *Music Theory Spectrum* 7 (1985):185–190.
- . *Stravinsky and "The Rite of Spring."* Berkeley and Los Angeles: University of California Press, 1987.
- Vander Weg, John D. "An Annotated Bibliography of Articles on Serialism, 1955–1980." *In Theory Only* 5/1 (1979):1–36.
- Whittall, Arnold. "Music Analysis as Human Science? *Le Sacre du Printemps* in Theory and Practice." *Music Analysis* 1 (1982):33–53.
- Wilson, Paul. "Concepts of Prolongation and Bartók's Op. 20." *Music Theory Spectrum* 6 (1984):79–89.