

reviews

Andrew Mead. *An Introduction to the Music of Milton Babbitt*. Princeton: Princeton University Press, 1994. 321pp.

Reviewed by Jason Eckardt

Milton Babbitt's compositions and writings stand as some of the most dazzling and provocative contributions to post-World War II music and scholarship. His music is among the most individual and vital of our time, and his articles and teaching have played an important role in the establishment of composition and contemporary music theory as viable academic pursuits. Babbitt was also one of the pioneers of electronic music composition, and several of his works in this medium are considered seminal. It therefore seems appropriate that his work be given the treatment it deserves in an extended volume.

Much of the writing on Babbitt's music has concerned his compositional methods. *An Introduction to the Music of Milton Babbitt* continues this tradition, and Andrew Mead writes on his subject with authority, lucidity, and enthusiasm. The author's analysis and discussion of Babbitt's compositional practices are consistently decisive and articulate and will reward careful study. The bibliography is extensive, and the discography and list of compositions are thorough and helpful. Mead's discussions of the compositional factors and designs in Babbitt's music are excellent. His writing is generally clearheaded and straightforward. Several works are considered, and many musical examples are provided. Mead has wisely chosen to analyze, for the most part, works that have been recorded, so that the reader may listen to works discussed in the text. For anyone interested in the way Babbitt makes his music, this volume is a valuable resource.

My primary criticism of the book is that Mead's analyses, as fine as they are in detailing Babbitt's compositional techniques, often do not serve the author's stated intention to "elucidate ways of hearing that will lead the listener to a greater appreciation of a rich and rewarding musical world" (4). Mead proclaims that "the best introduction to Babbitt's music is to listen" (9), and he justifies his analyses, stating, "Our appreciation of . . . Babbitt's music . . . depends on our ability to perceive the underlying structure behind the local details, to follow events below the surface" (5). Given that Mead's analyses illustrate the methods employed by Babbitt in the composition of both the background and surface of his music, I

assume that the “underlying structure” to which he refers in the previous statement is Babbitt’s compositional design for a given work.¹ Underlying structure is probably inferred by assembling details of the musical surface into meaningful patterns. But following those details may lead the listener to infer different structures, ones that may have little or no relation to Babbitt’s compositional designs. Mead believes that “unless we attempt to hear the ways [Babbitt’s musical surfaces] reveal the underlying long-range motion . . . that forms the lasting emotional drama of his compositions,” the listener will only receive “incidental gratification” (4). Although Mead and I are in agreement that “[o]ne of the rewards of listening to and thinking about Milton Babbitt’s music is that it constantly offers up new interpretations” (202–03), the only “informed hearing[s]” (3) that his analyses suggest are ones reliant on the perception of Babbitt’s compositional designs. I believe that an attentive listener can have a rich and satisfying hearing of Babbitt’s music that yields both fascinating structures and strong emotional responses without any knowledge of the background structures employed by the composer. My assertion assumes that the definition of an informed hearing of Babbitt’s music is open to debate; for Mead, it appears to be a closed issue.

Although he believes that a listener must engage in “a radical reinterpretation of the significance of virtually all our basic musical perceptions” (11) to properly hear twelve-tone music, Mead spends frustratingly little time discussing strategies for hearing structural aspects of this repertoire. To comprehend twelve-tone music more clearly, Mead reasons, the listener must perceive pitch-class aggregates (the twelve pitch classes of the chromatic scale) as they pass across the musical surface. He writes:

[G]iven a collection with a large number of different pitch classes, each represented once, we *can* recognize . . . whether or not any additional note represents a new pitch class. By interpreting the recurrence of a pitch class as a signal that we have crossed a boundary, we can parse a highly chromatic undifferentiated musical surface into a discrete series of large bundles of pitch classes that we might call *perceptual aggregates*. (12)

Key to Mead’s position on hearing twelve-tone music is the perception of repetition. By recognizing pitch-class repetition, the listener infers structural boundaries that segment the musical surface. Despite Babbitt’s and Schoenberg’s predilection for pitch-class repetition within aggregates, Mead maintains that this is a cornerstone of the perception of twelve-tone music.²

I question this assumption. As much recent writing on music cognition suggests, pitch is only one parameter used by listeners to parse the surface

of an atonal work.³ While pitch certainly plays a role in the listener's organizational strategies, factors such as timbre, dynamics, rhythm, register, articulation, temporal adjacency, and textural density are likely to be important, perhaps dominant, factors in perceptual segmentation. Since Babbitt makes use of non-pitch parameters to articulate various pitch-class aggregate structures, it seems odd that the author does not acknowledge the importance of these parameters. Furthermore, some pitches "present" on the musical surface can sometimes elude a listener because of the acoustic effect of "masking," whereby, due to the varying degrees of amplitude of simultaneous sounds, lower-amplitude sounds become difficult or impossible to hear.⁴ If certain pitches are unintelligible during audition, the listener's ability to hear aggregates, following Mead's strategy, would be seriously impaired.

Any decent musical analysis will provide for the reader new ways of thinking about the piece it analyzes and, therefore, influence the way in which the reader hears that piece. Several of Mead's observations undoubtedly provide interesting things to listen for in Babbitt's compositions. Nevertheless, even the most careful and experienced listeners will need to bend their ears to hear all the underlying structural detail described in Mead's extended analyses.

Chapter 1 offers a brief discussion of tonal and atonal music, followed by a fifty-page primer on "Milton Babbitt's Compositional World." For the reader with a moderate-to-thorough knowledge of these materials, this chapter will serve as a reminder of the wide range of Babbitt's compositional technique and clarify the terminology that appears in the following chapters. However, for those unfamiliar with twelve-tone theory, this is hardly an introduction.⁵ Complex and abstract compositional procedures are presented with few musical examples and are often explained hastily.

The second chapter, "Mapping Trichordal Pathways (1947-1960)," looks at Babbitt's earliest mature works. Particular attention is paid to *Composition for Four Instruments* (1948), *Composition for Viola and Piano* (1950), the *Woodwind Quartet* (1953), and *String Quartet No. 2* (1954). In this chapter, we are finally shown the depth of Babbitt's compositional technique, as exemplified in his works. Certain invariants in Babbitt's methods are discussed. Most important of these is the principle of maximal diversity (i.e., the systematic exhaustion of all possibilities in some fixed domain).⁶ Serialism could be seen as possessing this property, since the entire chromatic is cycled through before the repetition of a pitch class. Babbitt extends this principle to domains other than pitch, such as combinations of instruments, structures of the twelve-tone rows, and distributions of rows in individual compositions.

Mead's analysis of *Composition for Four Instruments*, for flute, clarinet, violin, and 'cello, provides a breathtaking example of Babbitt's compositional

craft and invention. Although informed by the serial techniques of Schoenberg and Webern, *Composition for Four Instruments* exploits serial principles in a highly idiosyncratic way.⁷ Perhaps most striking is Babbitt's construction and subsequent musical realization of a trichordal array.

As Mead shows in example 1, a trichordal array comprises four ordered twelve-tone rows, each of which is partitioned into four groups of trichords; they are then superimposed on one another, so that each horizontal row of the array (or "lyne") and each vertical column forms an aggregate.

Each trichord of *Composition for Four Instruments's* array features an intervallic structure with a rising or falling interval of either three or four semitones. Read horizontally, the top lyne of the array, shown in example 1, forms intervals within trichords of $+3/-4$, $-4/+3$, $-3/+4$, and $+4/-3$: all the possible combinations of these interval pairs. Similarly, each columnar (vertical) aggregate is formed by four trichords, each of which represents one of the four intervallic ordering pairs. (The first column, from top to bottom, reads $+3/-4$, $-3/+4$, $-4/+3$, and $+4/-3$.) The interval pairs, because of these interval orderings, collectively present the four "classical" transformations of the twelve-tone system: prime, inversion, retrograde, and retrograde inversion.

These trichords are registrally stratified in the opening clarinet solo of *Composition for Four Instruments* (ex. 2), with the top two lynes of the array in the high register and the bottom two lynes in the low register. Mead explains that Babbitt's array lyne-pairing choices are not arbitrary. Each hexachord of a lyne may be combined with the hexachord of the other lyne of the pair to create the aggregate. In this instance, if we combine the first trichords of the lyne pairs, both result in the hexachord type $[0\ 1\ 4\ 5\ 8\ 9]$.⁸ This is a harmonic contrast to the $[0\ 1\ 2\ 3\ 4\ 5]$ hexachord type found in the lyne aggregates (ex. 1). Most often, the trichords are not presented in their entirety but rather with some interpolation of pitch classes from some other trichord from a different lyne. By the end of the first aggregate of *Composition for Four Instruments* (mm. 1-6, ending on F), we have heard the completion of the first columnar aggregate, while each of the lyne aggregates, remaining stratified in their own registers, is not completed until the fourth and final columnar aggregate is (mm. 13-16).

In Babbitt's compositions, abstract structures are realized on the musical surface and simultaneously embedded at deeper levels. As Mead observes, the conjoining of array lyne trichords, rather than their solo presentation, characterizes the opening of *Composition for Four Instruments*. Example 3a illustrates the distinction between trichords that are intertwined and those presented alone, with regard to their register, temporal placement, and their transformation type (which is derived from each trichord's ordered interval pair, where the prime form is $+4/-3$). If we

Example 1 (from Mead, p. 60): Trichordal array, *Composition for Four Instruments* (excerpt).

The image shows a musical score for four staves. The first two staves are enclosed in a box labeled "LYNE PAIR AGGREGATE". Above the first staff is the label "P" and a trichordal array [0,1,2,3,4,5]. Above the second staff is the label "I7P". Above the third staff is the label "Q" and a trichordal array [0,1,4,5,8,9]. Above the fourth staff is the label "I7Q". The music consists of eighth-note patterns across four measures.

P = prime, I7P = inverted prime at a transposition level of 7 semitones, Q = prime with trichord orderings reversed for each hexachord, I7Q = inverted prime at a transposition level of 7 semitones with trichord orderings reversed for each hexachord.

compare this chart to the distribution of instruments throughout the eight sections of the piece (ex. 3b), it becomes clear that Babbitt is interpreting the same abstract pattern in two musical dimensions.

Mead discusses these points, and many others about *Composition for Four Instruments*, with clarity. However, if his intention is to show us how "this piece . . . illuminates a wide variety of Babbitt's compositional practices and dramatically demonstrates their effect on our hearing of twelve-tone music" (55–57), he neglects important issues. The above analysis is focused on the domain of pitch, exploring how pitch classes are stratified in various registers and form trichordal interval patterns. Mead writes very little about other parameters, many of which have a strong influence on my hearing of *Composition for Four Instruments*. For example, Mead is concerned with the perception of pitch-class repetition in the determination of "perceptual aggregates." It seems that the beginning of the third aggregate of the clarinet solo should have particular salience for the listener. In m. 9, the clarinet completes its second aggregate on G-natural. The clarinet's third aggregate begins with B₃ on the last eighth note of m. 9, with a dynamic marking of *mezzo piano*. As the third aggregate begins with the same register, dynamic, and pitch class as the first sound in the piece, I suggest that this is a clear indication of a structural boundary. This boundary is powerfully reinforced by the two eighth-note rests that

Example 2: Opening measures, *Composition for Four Instruments*.

Clarinet in C

$\text{♩} = 120$

The musical score for Clarinet in C consists of five staves. The first staff begins with a tempo marking of quarter note = 120. The music is written in treble clef and includes various time signatures: 2/4, 4/4, 3/4, 5/4, 3/4, and 2/4. Dynamics range from *mp* to *ff*. The score includes slurs, accents, and dynamic hairpins.

Example 3a (from Mead, p. 61): Distribution of trichords, *Composition for Four Instruments*.

Partition: 1 + 3 2 + 2 3 + 1 2 + 2 3 + 1 2 + 2 1 + 3 4 + 0

High	{ R	{ 1	{ RI	{ P	{ T6RI	{ T6P	{ T6R	{ T6I
	{ RI	{ P	{ R	{ I	{ T6R	{ T6I	{ T6RI	{ T6P
Low	{ I	{ R	{ P	{ RI	{ T6P	{ T6RI	{ T6I	{ T6R
	{ P	{ RI	{ I	{ R	{ T6I	{ T6R	{ T6P	{ T6RI

$P = +4/-3$

Example 3b (from Mead, p. 58): Distribution of instruments, *Composition for Four Instruments*.

Partition:	1 + 3	2 + 2	3 + 1	2 + 2	3 + 1	2 + 2	1 + 3	4 + 0
VIOLIN	X	X	X	X	X	X	X	X
CELO	X	X	X	X	X	X	X	X
FLUTE	X	X	X	X	X	X	X	X
CLARINET	X	X	X	X	X	X	X	X

precede the B-natural, providing the longest silence heard thus far. Mead does not acknowledge these factors.

The boundary between the first and second aggregates (mm. 6–7) is articulated in a different way. The first aggregate ends on F-natural (m. 6), followed by a rest. On the next downbeat (m. 7), the C-sharp begins the second aggregate. The dynamic of the previous three and a half measures has been *mezzo piano*. With the beginning of the second aggregate, the dynamic environment changes. The C-sharp is sounded *mezzo forte*, and then there is a sudden shift to *piano* on the B-natural, followed by a *fortissimo* B-flat on the second half of the third beat (m. 7). This sudden flux of dynamic levels offers a sharp contrast and seems to me an even stronger indication of a boundary than the pitch-class repetition beginning in m. 7. Furthermore, Babbitt writes a slur over the first six measures, and the articulation distinguishes the opening aggregate from those that follow. Again, the boundary between aggregates is marked with a silence (an eighth-note rest, m. 6). While an attentive listener might hear a boundary between the D-natural and the F-natural in m. 6, since it represents the longest rest heard thus far in the piece, the combination of a rest with the following shift in dynamic and articulation beginning with C-sharp strongly suggests a more significant boundary.

I have chosen to focus on only one of the works considered in chapter 2, which adequately demonstrates the rigor of Mead's analyses. Other analyses in the chapter maintain a similar set of concerns, with particular attention paid to the ways in which Babbitt creates new works through the reinterpretation of the array structure used in *Composition for Four Instruments*. These analyses are very detailed and the pace of presentation is rapid; even a passing point will sometimes require close examination of the examples and musical excerpts. One gets the impression that Mead cannot write enough about Babbitt's music, and the author frequently laments the lack of space available to expound on issues he raises.

The author's concern is more pronounced in chapter 3, "Expansion and Consolidation (1961–1980)." Rather than attend to a few representative compositions, as he does in chapter 2, Mead discusses excerpts of several works to illustrate Babbitt's development of new compositional techniques. Because Babbitt's use of these new compositional tools becomes even more particular to individual works, Mead does not want to short-change the breadth of Babbitt's ideas in the interest of more extended analyses of single pieces.

According to Mead, the "structural hallmark of Babbitt's compositional practice in his second period is the all-partition array" (125). An all-partition array, like its trichordal counterpart, is a two-dimensional concatenation of lynes partitioned so that their individual segments, when superimposed on other segments from different lynes of the array, create

aggregates that are formed vertically, in columns. An array in which lynes are partitioned in all possible ways, with respect to the number of pitch classes in each partition, is an all-partition array (ex. 4). These lynes are paired together in the array, and also become connected in particular ways in Babbitt's music, as they were in *Composition for Four Instruments*.

Mead also discusses a major change in Babbitt's compositional technique: the development of the time-point system, a method of interpreting arrays in the rhythmic domain. While Babbitt had been using various techniques to derive his rhythms from serial structures, the time-point system carried heavier implications for rhythmic formation in his work.⁹ In the time-point system, Babbitt interprets the integers of the array as attack points in a finite temporal span, or modulus, which is divided into twelve equal parts. For example, a simple modulus is a measure of $\frac{3}{4}$, in which each sixteenth note in the measure represents one of twelve time points. If 0 is considered the first sixteenth note, then 5 falls on the sixth time point. That time point in a modulus of $\frac{3}{4}$ occurs on the sixth sixteenth note of the measure, the second sixteenth note of the second beat. (The time-point system only prescribes the placement of attacks, not duration.) In Babbitt's works, these time points are coordinated in various ways with pitch-class interpretations of the same array, or some transformation of it.

The time-point system provides Babbitt with a new and powerful way of structuring surface rhythmic formation. However, Babbitt's treatment of the dimensions of pitch and rhythm raises certain issues for Mead. Most problematic is the reconciliation of the time-point modulus with octave equivalence. By dividing the time-point modulus into twelve parts, with each consecutive set of twelve time points beginning a new modulus, Babbitt makes an analogy to pitch-class octave equivalence. Clearly, however, these are two domains so different that they hardly seem complementary. Babbitt himself is quick to point out that the number twelve has absolutely no inherent significance in the temporal domain (Babbitt 1962:71-72).¹⁰ It is worth noting, as Mead does, that a pitch-class interpretation of the array in Babbitt's music is most often dependent on register or timbre for the stratification of lyne pairs on the musical surface. Babbitt turns to other parameters, usually dynamic, to connect time points in individual lynes and to distinguish lynes or lyne pairs from one another. It is through these techniques of distribution of time points and pitch classes, Mead argues, that Babbitt is able to realize rhythmic structures with the same subtlety that he does his harmonic structures.

While critics have tried to reduce Babbitt's array composition to the obligatory fulfillment of a series of *a priori* decisions, Mead's sections "Composition of Details" and "A Brief Venture into Comparative Anatomy" convincingly present arguments to the contrary. Mead writes that "arrays contain certain structural potentials that can be realized in a

Example 4 (from Mead, p. 274): All-partition array, *Post-Partitions* (excerpt).

T-P Mod.	P-C Reg.														
8	high	5 t	2 31			67	79 0	4 8e		03 7245		3 59	e	t8 6	81
3		1 6	8 9		te 954	3 2	0 2	4976 7	6 e	2		01	5	3	t
7		7 3	4 t0			89e 5	e6 5	6 2	0532			2t 8e764	1		9
4		0 8	5 e		32 76	t 4	t1 4				74 3t		489		e6
6		e 2	6 7	89 54		1 0		1t 3							304572
5	low	4 9		732 6te	0 18			8	5 81		t19	986		e	
														t6 0237	74 9

T-P Mod. = Time-Point Modulus

P-C Reg. = Pitch-Class Register

number of different strategic solutions" (128) and illustrates this point by showing us the ways in which Babbitt "composes out" his array structures. Mead demonstrates how, by stratifying their materials in particular musical dimensions, Babbitt takes the same abstract array structures and uses them to create remarkably different pieces.

Chapter 3 ends with two extended analyses, the first of which discusses *Post-Partitions* (1966), one of Babbitt's most well-known compositions for the piano. The opening of this work reveals much about Babbitt's middle-period compositional practice. *Post-Partitions* begins with an outburst of dyads, which exhaust the entire registral range and dynamic capacity of the piano. The pitch and rhythmic material of the first measure is represented in the first column of *Post-Partitions*'s array (ex. 4). In the pitch domain, Babbitt has stratified each lyne pair in register from high to low, and the dyads that appear in the opening are composed of these array lyne pitch classes. Each lyne in each pair is distinguished by articulation: the top lyne of each pair (but not necessarily the highest in register) is presented staccato, while the lower lyne is sustained. In the rhythmic domain, Babbitt casts each lyne pair in a different time-point modulus, from thirty-second-note subdivisions to triplet eighth-note subdivisions. Each time-point integer is distinguished by one of twelve dynamic levels from *ffff* to *ppppp*¹¹ (ex. 5).^{12, 13} Example 6 reproduces the first measure of *Post-Partitions*, with time-point integers enclosed in circles.¹⁴ Although this example is brief, it nevertheless brings to light the vigor of Babbitt's compositional techniques as described by Mead.

Example 5 (from Mead, p. 175): Time-point moduli, *Post-Partitions*.

Time points: 0 1 2 3 4 5 6 7 8 9 t e
 Dynamics: *ffff* *ppppp* *pppp* *ppp* *pp* *p* *mp* *mf* *f* *ff* *fff* *ffff*

Again, Mead provides much valuable information too detailed to mention in this context. In his pursuit of deeply embedded structural connections, however, he sometimes loses sight of his intention to provide information that might contribute to a clearer hearing of Babbitt's music. For example, his analysis of *Post-Partitions* ends with a discussion of the last attack of the piece and the events that lead up to it. The final measure of *Post-Partitions* (ex. 7) features a *ffff* attack on F-sharp, C-sharp, and F, over an A-flat sustained from the previous measure. Mead connects these pitch classes to the E found in the highest register of the penultimate measure and to the E-flat that precedes it, also in this measure. Mead's goal is to extract the [0 2 3 4 5 7] hexachord type from the texture, since this hexachord underlies the formation of array lynes and surfaces throughout the piece. Mead points out that all the pitches of this hexachord are marked with loud dynamics, and the E-flat and E appear in the higher registers of the penultimate measure. However, the E-flat and E appear simultaneously with their dyadic counterparts of G and B, respectively.

Example 6: First aggregate, *Post-Partitions*, m. 1, with time-point annotations.

♩ = 90
sempre 8 higher

mf ff fffff

ppppp p fffff

ppppp ppp pp fffff

mp f fffff

sempre 8 lower

Example 7: Last two measures, *Post-Partitions*.

8 --

ppppp ff p f fffff

ppppp ff mp mf p f fffff

pp pppp pppp fffff

ppppp p

8 --

Furthermore, the B of the {E B} dyad is higher in register than the E-flat. The dynamic level of the first {E B} dyad attack is *ppppp*, a distinctly lower dynamic than the dynamics ranging from *f* to *ffff* associated with other members of this hexachord type. Essentially, Mead expects the listener to ignore the lower-register pitch classes of the {E♭ G} and {E B} dyads, to disregard the *ppppp* dynamic level of the first attack of the {E B} dyad, and then to connect the E-flat and E to the {F# C# A♭ F} appearing in a different register in the last measure. Since the [0 2 3 4 5 7] hexachord type is an important structural element in the piece, Mead may claim that the hearing he proposes has been "prepared." Nonetheless, on a surface as dense and restless as that of *Post-Partitions*, a hearing this specific to hexachordal associations may prove inaccessible for even the most careful listener.

Over the past forty years, Babbitt's structural concerns have grown more vast and elaborate, and his compositional techniques have developed accordingly. The fourth and final chapter, "The Grand Synthesis (1981-)," focuses on Babbitt's present compositional procedures, which have produced perhaps the most complex and individual works of his career; they have also supported works of the greatest scope with regard to their variety of surface figurations and details, underlying structural formations, duration, and instrumental forces.

Central to the composition of Babbitt's recent music is the superarray, a structure created by layering arrays on top of one another. The superarray provides Babbitt with an even denser contrapuntal framework within which to compositionally maneuver. Babbitt maintains careful control of the superarray's presentation, using parametric definition (in the domains of register, dynamic, timbre, and articulation) to distinguish the constituent arrays of the superarray, much in the way he distinguished lynes and lyne pairs in his earlier compositions. Implicit in the superarray is the duplication of pitch classes during the simultaneous presentation of multiple columnar aggregates.¹⁵ Babbitt's composing-out of the superarray in various works both highlights and obscures this property.

In example 8a Mead provides the superarray whose first composite column is realized in the opening of *Mehr "Du"* (1991), for soprano, viola, and piano (ex. 8b). The two simultaneous aggregates of the first three measures are assembled from lynes that are stratified in the lowest register of the viola in the top array, and in the low voice, mid-high and mid-low registers of the piano in the bottom array. Here, Babbitt avoids setting the same pitch classes in rhythmic unison or in temporally adjacent positions.

The synthesis to which Mead refers in the title of his last chapter is the fusion of two major concerns in Babbitt's previous periods: trichordal and all-partition arrays. While some of his superarrays utilize a single array

Example 8a (from Mead, p. 254): Superarray, *Mehr "Du"* (excerpt).

Top Array	sul pont.		23e10t							
	pizz.		34021	976				6845		
	high Va.		5786t		1(e)			9		
	med				754623		980te1	3		
	low	e98t67		8	8		562	7e	e9t0	
	low	023154		5					2431	
Bottom Array	Voice (high)		9e	4	0	437	0t21	7568		
	Voice (low)	20e1					7	784653		
	high			et2	201	3		9t		
	↑ Pno.			467	598		8			
	↓ low	5	786		34	402	1e		t9	
			9	980		7	54(6)23		1	
	79t8						0	0e		
	643		351					2		
		te		e7	986					
		104(2)35			5					

Example 8b: Opening measures, *Mehr "Du."*

The musical score shows three staves: Soprano (Sop.), Viola (Va.), and Piano (Pno.). The Soprano part begins with a rest, followed by the lyrics "Du sträubst und wehrst!". The Viola and Piano parts feature complex rhythmic patterns with triplets and accents. The score includes dynamic markings such as *ff* and *f*. The time signature changes from 2/4 to 3/4 and then to 3/8.

transformed through twelve-tone operations to produce derived arrays that are then superimposed, others utilize non-derived constituent arrays, often combining trichordal arrays common to the first period with all-partition arrays of the second. Trichordal formation, crucial to earlier pieces, continues to occupy Babbitt in the form of the all-trichord row, a twelve-tone row whose ordering contains overlapping partitions of nearly all of the trichord types.¹⁶ Babbitt further integrates his former practices by sometimes using these all-trichord rows as the lynes in all-partition arrays. These arrays are then themselves combined with other arrays to form superarrays.

Perhaps because there is no "typical" Babbitt superarray composition, Mead shies away from extended analyses, opting mostly for ones that last no more than a few pages. Presumably, Mead is attempting to illustrate the various ways in which Babbitt has reinterpreted a central structural idea in his music. Yet, with ideas as complex as those presented here, it would have been more rewarding to be guided through a significant portion of a superarray composition. Noticeably absent is any extensive discussion of Babbitt's recent time-point techniques, leaving the reader to wonder how Babbitt has integrated new developments such as the superarray into the rhythmic domain.

In the brief analyses Mead does offer us, he details the structural richness and surface variety in Babbitt's recent music. Again, I am disappointed that Mead is so determined to offer us analyses outlining Babbitt's compositional designs that many striking features of the music are slighted or ignored. For example, in his discussion of *Whirled Series* (1987), for saxophone and piano, Mead describes the end of the piece as a "ferocious conclusion [where] the final composite aggregate [is] composed out over an extraordinary twenty-four bars" (226). The ending to this piece is so unique that Mead obviously felt it was worth mentioning. But in light of Mead's attempt to offer information that will aid in our hearing of Babbitt's music, I am surprised that he does not discuss in greater depth the sense of finality that is achieved by the suspension of the last composite aggregate. A cadence is generally thought of as a harmonic resolution to a stable point of rest. While all of the music that precedes the conclusion of *Whirled Series* is characterized by a much faster aggregate turnover rate, the ending obsessively reiterates the final composite pitch-class aggregates of the superarray over a considerable period. It thus sounds comparatively stable, setting the piece's harmonic motion at rest by settling on a "cadential" aggregate group (ex. 9).

An Introduction to the Music of Milton Babbitt provides a meticulous and comprehensive study of Babbitt's compositional techniques. As an introduction to Babbitt's music, this book will be a challenge for anyone not

Example 9: Final measures, *Whirled Series*.

The musical score consists of two systems. The first system (measures 424-426) features the Alto Sax (in E) on a single staff and the Piano on two staves. The Alto Sax part includes dynamic markings of *pp*, *f*, *ff*, and *p*, along with articulation marks for slurs and accents. The Piano part includes *pp*, *f*, *ff*, and *p* dynamics. The second system (measures 427-429) continues the same instrumentation. The Alto Sax part features *ff*, *pp*, *p*, and *f* dynamics, with a *pp* dynamic in the final measure. The Piano part includes *ff*, *pp*, and *f* dynamics. Both systems include various rhythmic markings such as slurs, accents, and dynamic hairpins.

possessing a strong background in twelve-tone theory and not somewhat familiar with Babbitt's compositional techniques. As a guide to hearing Babbitt's music, *An Introduction* frequently relies too heavily on the relationships and features found in the composer's structural designs. Mead often disregards the more obvious surface characteristics that may lead a listener to some of Babbitt's structural underpinnings, and he never examines ways structure might be aurally perceived outside of Babbitt's compositional designs.

To be fair, Mead remarks that his analyses only "scratch the surface" (76, 202) or "pass over much of the richness of the composition's details" (115). Because Mead believes that Babbitt's underlying compositional designs are "the source that animates the farthest reaches and ramifications of the sounding surface" (5), perhaps he would argue that we are always in some sense "hearing" Babbitt's designs since surface details are local manifestations of deeper levels of large-scale structure. Nevertheless, the

Example 9 (cont.)

The musical score consists of two systems, each with a vocal line (treble clef) and a piano accompaniment (grand staff).
 System 1 (measures 429-436):
 - Measure 429: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *ff*.
 - Measure 430: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *pp*.
 - Measure 431: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *mp*.
 - Measure 432: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *ff*.
 - Measure 433: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *p*.
 - Measure 434: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *ff*.
 - Measure 435: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *p*.
 - Measure 436: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *ff*.
 System 2 (measures 437-444):
 - Measure 437: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *ff*.
 - Measure 438: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *p*.
 - Measure 439: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *f*.
 - Measure 440: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *pp*.
 - Measure 441: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *ff*.
 - Measure 442: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *p*.
 - Measure 443: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *f*.
 - Measure 444: Vocal line starts with a half note G4, followed by quarter notes A4, Bb4, C5, Bb4, A4. Dynamics: *pp*.
 The piano accompaniment features a complex rhythmic pattern with many sixteenth and thirty-second notes. Dynamics in the piano part also vary, including *ff*, *p*, *f*, and *pp*. There are also some dynamic markings like *ff* and *p* in the bass line.

translation from background compositional structure to musical surface realization may be too complex for the listener to explicitly infer an intricate compositional design such as an array in the degree of detail that Mead describes in his analyses. What this book does show us is how Milton Babbitt composes.

Notes

1. "Composition" here refers to the structural planning that produces a set of constraints before the "composing" begins, as well as to the production of the musical score.

2. Mead acknowledges that "[i]n most twelve-tone music there are extensive examples of pitch-class repetition within aggregates" (13), but he never makes clear how the listener might distinguish internal pitch-class repetition within, as opposed to between, aggregates.

3. Non-pitch parameters and their role in the perception of atonal music have been explored by Deliège (1989), Krumhansl (1991), Clarke and Krumhansl (1990), Tenney and Polansky (1980), and Nonken (1999), among others.

4. See Morris (1987:295); Bregman (1990:320–23, 392).

5. Excellent resources for the terms discussed and notation used in Mead's book may be found in Forte (1973), Rahrú (1980), Morris (1987), and Straus (1990).

6. For a detailed discussion of maximal diversity in selected compositions by Babbitt, see Dubiel (1992).

7. Babbitt discusses the influence of Webern's *Concerto for Nine Instruments* on the structure of the opening aggregate of *Composition for Four Instruments* in Dembski and Straus (1987:24–28).

8. Pitch classes are notated in integers where C=0, C-sharp=1, D=2, etc. To avoid confusion, the pitch-class integers 10 and 11 are notated as "t" and "e," respectively. Collection classes (i.e., pitch-class set types that are equivalent under transposition and inversion) are notated in square brackets; curly braces denote unordered collections that are not equivalent under transposition and inversion.

9. Babbitt's most notable earlier rhythmic practice was the use of duration rows. Duration rows are built on orderings of durational values from 1 to 12 that increase incrementally in size. For example, if the durational value of 1 is a sixteenth note, 2 would equal an eighth note, 3 would equal a dotted eighth note, and so forth. Typically, duration rows are numerical translations of ordered pitch-class integers found in pitch-class rows.

10. It should further be stated that the number twelve has no inherent significance in any musical domain. While the octave in Western art music is divided into twelve equidistant parts, this is still not an inherent quality of pitch.

11. Mead offers insightful comments with regard to Babbitt's dynamic markings, noting that the extremes of dynamic do not represent absolute levels of amplitude but rather "indicate inflections within a normal range of dynamics [so that] we can hear in his music a series of contours of intensity that maintain their identity under various sorts of transformations. . . . These notated contours reflect the flexibility available with the dynamic range, a quality found in performances of, if not precisely notated in, the more familiar repertoire" (176–77). However, for a listener to be able to aurally distinguish, for example, time-point lines by hearing the incremental differences in the dynamics that stratify these lines, the listener must make distinctions between absolute dynamic levels. Mead fails to address this contradiction.

12. Babbitt sometimes repeats a time point within a measure if the modulus is shorter in duration than the measure, and the position of the time point within the repeated modulus in the measure allows space for reiteration of the time point. In m. 1 of *Post-Partitions*, time point 0 is repeated (as the *ffff* [A E] dyad attack on the downbeat of beat four) as well as time point 2 (the *pppp* [Bb F] dyad attack on the second triplet eighth note of beat three).

13. The dynamic stratification of individual time points coupled with the use of different, simultaneous moduli in *Post-Partitions* is somewhat unusual in Babbitt's

oeuvre. More often, time-point array lynes are cast in the same modulus, with each lyne or lyne pair stratified by different dynamic levels.

14. In some cases, such as with time points 1 and 2, and 6 and 8, in m. 1 of *Post-Partitions*, certain attacks, although from different moduli, occur simultaneously. Babbitt specifies different dynamic levels for the upper and lower pitch classes of the dyads that fall on simultaneous time points to distinguish the time-point lynes from one another.

15. Pitch-class duplication within array columns also occurs in earlier works, in which Babbitt has transformed the array in such a way that the lyne aggregates are preserved but the array columns contain pitch-class duplications. These columnar collections that contain pitch-class duplications, and are therefore less than twelve pitch-class types, are referred to as weighted aggregates.

16. Mead suggests that Babbitt has omitted the [0,4,8] and [0,3,6] trichord types because “[t]he former cannot be ordered to represent the four classical transformations [prime, inversion, retrograde, and retrograde inversion] unambiguously, and the latter is the single trichord type that cannot generate an aggregate” (156).

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