7 | Milton Babbitt and 'Total' Serialism

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Milton Babbitt has regularly been accepted as one of the earliest adopters of what has come to be known as integral, total, or, most often in its European flavour, multiple serialism. Many European composers of the mid-twentieth century, including Pierre Boulez, Karlheinz Stockhausen, Luigi Nono, and Jean Barraqué have been central to this movement, and painted with a broader brush, it would include contributions by the likes of Olivier Messiaen and Elizabeth Lutyens. What sets Babbitt apart from this group encompasses both his compositional techniques and his roots as an American musician. In the following, I will concentrate on the former, with at the very least an awareness of the latter.

Milton Babbitt grew up in the city of Jackson, Mississippi, but also spent a significant amount of time with a branch of his family in Philadelphia. He played the clarinet from an early age and was a member of a variety of ensembles during those years. His awareness of musical structure would seem to be precocious. He narrates becoming aware of local and long-range note relationships in a performance of Weber's *Oberon* overture and mentioned on several occasions receiving scores of modernist music, including some works of Arnold Schoenberg, from an uncle who regularly travelled in Europe. His study with Marion Bauer in New York City reinforced his interest in the most recent developments in music composition (Babbitt 1976).

While Babbitt wrote a handful of pieces employing more traditionally tonal techniques, some of the earliest fragments available show that he had absorbed the lessons of Arnold Schoenberg's method of composition employing twelve notes only related to each other from the very start (see Brody 1993). Owing to his activities during the Second World War, Babbitt did not start publishing music until 1947, the year of the *Three Compositions for Piano* and the *Composition for Four Instruments*. With these two works, Milton Babbitt set the stage for what was to become a career-long development of a remarkably fruitful and flexible compositional technique.

Babbitt's compositional interests grow from a close reading of both Arnold Schoenberg's and Anton Webern's twelve-tone techniques.

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However, while both Schoenberg and Webern saw their music as connecting with and furthering the traditions of European, in particular Germanic, composition, Babbitt was interested in exploring what he saw as the profound differences between the first principles of scale-based music and those of music based on successive orderings of the total chromatic. Both Schoenberg and Webern, each in his own way, sought to infuse such traditional formal practices as the sonata-allegro or theme and variations with the relational possibilities derivable from the use of twelve-tone rows. Babbitt, on the other hand, was interested in imagining a music whose every element of formal practice might derive *ab novo* from those same possibilities (Babbitt 1976).

This is not to say that Babbitt was totally disconnected from the musical past, especially his own musical past. But his position with regard to making music was inevitably different from that of his European predecessors. He was an American, and while he had a solid grounding in Old World musical traditions, he was also steeped in the rich variety of American music making as well. Nor was he intent on throwing over the received instrumental traditions of Europe. While he was a pioneer in electronically produced music, part of his adoption of the synthesizer can be attributed to his apparent frustration with many of his experiences with live performance (see Babbitt 1958, 1962, 1965, and 1970). But he remained until the very end of his life dedicated to music as something that was made by living players in real time. In fact, with the exception of three solo synthesized works, Babbitt's use of pre-recorded taped music was generally coordinated with one or more live performers, and those compositions that use synthesis are a relatively small corner of his work as a whole. Babbitt's writing for traditional instruments might be, or might have been at one time, found extremely demanding and well outside of what would have been considered idiomatic, but his actual use of traditional instruments was largely conservative in nature, drawing on well-established playing techniques and frequently recognising the different capabilities of instruments as a factor in how his musical imagination could be brought to sounding life through them.

A fundamental factor of twelve-tone composition as Babbitt understood Schoenberg's compositional practice derives from the profound difference between what a note, or pitch, or pitch class, might mean in a tonal context as opposed to the context of the twelve-note aggregate. In traditional tonal music, a sounding pitch takes on meaning from its context within a given diatonic collection. The pitch class C, for instance, is without meaning until it is heard as embodying a scale degree. Scale degrees in tonal music are

therefore the smallest unit of structural, or grammatical, meaning, with pitch being the articulator thereof. In music based on a sequence of aggregates – complete or for all intents and purposes complete presentations of the twelve pitch classes – *aggregates* are the smallest unit of structural meaning, taking on their individuality from the ways their constituent elements, the twelve pitch classes, are distributed within them. Aggregates compose the heard surface of the music; twelve-tone rows, deployed in a variety of ways, therefore can become a way of controlling how aggregates are structured and how they can then be deployed in chains of associational relationships (Babbitt 1976).

I have gone into this in some detail in order to make a fundamental point that Babbitt was to take on in a variety of ramifications: an aggregate represents a total compendium of possibilities (the twelve equal-tempered pitch classes), which adopts a recognisable profile by the ways those pitch classes and the intervallic relations amongst them are distributed within it. It is possible to generalise this into a wide variety of musical situations and give it a name: the idea of maximal diversity. This became a kind of guiding principle, which saturates Babbitt's technical developments throughout his creative life. Such a principle can be read as being completionist, but it need not be so. One could imagine a list of possibilities that itself was not complete, but which contained no repetitions, such as all of the trios and duos of a group of six different instruments. Such lists occur in a variety of instances throughout Babbitt's life, but they exist alongside lists that are in fact complete; their shared characteristic is a lack of repetition (Bernstein 2016).

Babbitt recognised that this principle could be articulated in a variety of ways in multiple musical dimensions, not just in pitch. But he also recognised that each of these dimensions was limited and determined by the different ways whereby listeners could perceive relationships within them. The linear nature of pitch in register is made cyclical by the ability to perceive octaves, and thus pitch class. Time is also linear, but not inherently cyclical, although cyclicity can be made manifest through compositional means. Dynamics are linear, but absolute intensity is not how people tend to hear. In fact, intensity can be a factor not only of some absolute decibel measure; it is also readily mediated through the means by which a sound is produced. Babbitt's music reflects a keen awareness of the difference amongst instruments, for example, not so much by changing its qualities based on how a given instrument is played, but by taking advantage of the ways different instruments (or voices) can traverse similar pitch and intervallic landscapes. Thus, for Babbitt, the idea of total serialism was

not an arbitrary application of abstract ideas to perceptually or structurally incommensurate musical dimensions. Rather, it involved a subtle awareness of both the similarities and dissimilarities of how we perceive the various dimensions conjoined in a musical utterance. In order to impart a greater understanding of his practice, I will deal with each musical dimension individually in a process of limning a sketch of Babbitt's compositional technique.

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As mentioned above (p. 108), Babbitt derived a great deal of his manner of treating pitch from both Schoenberg and Webern. From Schoenberg, he adopted the technique of combining more than one member of a row class to form an aggregate. Schoenberg's primary way of doing so has become known, largely from Babbitt's own writings, as inversional hexachordal combinatoriality, in which two rows are combined so that the first six elements and the last six elements of each form aggregates. From Webern, Babbitt adopted the technique of deriving a row from a single ordered trichord, representing the four traditional twelve-tone transformations within the body of the row itself (see Babbitt 2003).

These two techniques combined yielded the trichordal array, a structure that in various guises underlies much of the music of Babbitt's first compositional period and persists in one form or another throughout his career. Figure 7.1 shows the trichordal array found at the outset of his *Composition for Four Instruments*. This example additionally shows how the trichords are deployed at the opening of that work, but one may read the example simply as a presentation of a trichordal array.

As one may observe, each line (or 'lyne', the term coined to described individual strings of pitch classes in a musically uninterpreted array) forms an aggregate based on the four transformations of a trichord type, in the same way as the four quadrants of the array (arising from the hexachordal combinatoriality of the two distinct pairs of lynes) and its four columns (Kassler 1967). This has the effect of spreading the influence of any given trichord out over three different aggregate interpretations. Should one interpret such an array as projected by two pairs of similar instruments, then one can readily track how a given trichord could be heard as part of a lyne articulated by, say, a flute playing in counterpoint with the other three instruments; as contributing to an aggregate formed by a pair of like instruments, for example a flute and a clarinet; or as contributing to a combined texture of flute, clarinet, plus a pair of stringed instruments.

Figure 7.1 Trichordal array composed into fifteen subsets of four elements

Trichordal arrays provide opportunities for flexibility in a variety of ways. First, as may be seen in Figure 7.1, individual lynes do not necessarily have to be made from members of the same row class; indeed, in most cases they cannot be and still yield the same range of trichordal transformations in every position. Second, in creating such structures out of individual trichords, it is possible to use different orderings of constituent trichords, or even to vary the number of trichord types being used in their realisation. In the *Composition for Four Instruments*, Babbitt used two different orderings of two different trichord types over the span of the work, combined in a carefully controlled variety of ways. While indeed one may construct a row class in which the elements are made from one each of these four possible orderings, no actual member of this row class appears at the surface of the music. While a row is a particular ordering of the twelve

pitch classes, a row class is the collection of all those rows that may be related by a set of operations. Thus, the classical forty-eight-member row class would include all those rows related by transposition, inversion, and retrograde in all possible combinations. Several of Babbitt's works from the late 1940s and 1950s explore the range of possibilities inherent in the construction of trichordal arrays.

A second opportunity for compositional flexibility afforded by trichordal arrays entails the ways aggregates may be realised on a musical surface. I suggested that lynes might be articulated by individual instruments, but register or playing manner within a given instrument may be used as well. In his compositions using trichordal arrays, as well as those using different kinds of array structure, Babbitt explored a wide variety of ways of projecting his musical elements.

In any array with multiple lynes, pitch or pitch-class order is only specified within lynes but remains undetermined between lynes. This affords many opportunities for compositional interpretation and the creation of surface details that can be used to coordinate with details projected in different passages of the piece. A particular basic pattern that Babbitt regularly used with trichordal arrays may be found in the ways trichords are displayed in Figure 7.1.

In this example, each aggregate divides its trichords into either a grouping of one trichord and three trichords, or two pairs of trichords, or all four trichords at once. Since there are four possibilities for doing the first, three for the second, and one for the last, such a pattern will require two iterations of a trichordal array to be complete. These two iterations are normally related to each other using some basic twelve-tone transformation. We can think of this kind of pattern both as a series of partitions of four elements or as a particular ordering of the fifteen non-zero subsets of four elements, in this case trichords. As can be noted in the current example, the disposition of a single ordering of a single trichord type has enabled the array to be disposed to present all possible transformations of the ordered trichord in all possible combinations and locations. This, of course, is another manifestation of what I have suggested is a guiding principle of maximal diversity in Babbitt's work.

Such a disposition of trichords still does not determine completely the composition of any given aggregate in an array, but it does limit the possibilities in intriguing ways. Tracking all the possibilities Babbitt used for working within these constraints is beyond the scope of this essay, but doing so allows one to realise the balance between the self-imposed rules of

play and the inventive response to opportunities thus provided that is always a lively presence in Babbitt's music.

The pattern found in Figure 7.2 with trichords is something Babbitt employed with other musical dimensions as well. In the case of the *Composition for Four Instruments*, Babbitt used an analogous pattern applied to the ensemble as a whole to determine the piece's fifteen sections. It also informs the number and variety of combinations of his four different ordered trichords over the span of the piece. This means that the last section of the work, analogous to the combination of all four lynes in the array of Figure 7.1, is the only passage in which all four instruments participate, with all four ordered trichords. As the pattern appears in reverse order at this point in the work, it is only the opening aggregate of the final section in which all four ordered trichords and all four instruments are sounded together. This is illustrated in Table 7.1 and Figure 7.2.

Much of Babbitt's music of the late 1950s and early 1960s shows his interest in extending his compositional practice. Works such as *All Set* (1957), the *Composition for Tenor and Six Instruments* (1960), *Post-Partitions* (1966), and *Philomel* (1964) each take new steps in creating an unfolding counterpoint of lynes derived in whole or in part from a work's row class. From this developed a practice that underlies much of his later music, the use of all-partition arrays. Like a trichordal array, an all-partition array is comprised of lynes unfolding simultaneously, but unlike the earlier practice, all-partition arrays feature a unique disposition of lyne segments for each aggregate. Babbitt devised several all-partition arrays based on four, six, or twelve lynes (there is one example of an eight-part array, employed in his Third String Quartet (1970)). In general, Babbitt's all-partition arrays are built from hexachordally combinatorial lyne pairs, the number of which are determined (usually) by the number of distinct pairs of complementary hexachords found in a work's row class. Thus, for example, an all-partition array whose underlying row class is built using the hexachord type 014589 would only contain two hexachordally combinatorial lyne pairs, given that there are only two distinct pairs of such

Table 7.1 Instrumental disposition
in *Composition for Four Instruments*

Flute	X| X|X |X ||X | X|X |X ||
Clarinet	X |X |X | X||X | X| X|X ||
Violin	X| X|X | X||X |X | X|X ||
Cello	X|X | X|X || X|X | X|X ||

Figure 7.2 Trichordal disposition in the last section of *Composition for Four Instruments*

hexachords. On the other hand, an all-partition array built with 012678 would have three lyne pairs, while ones built using 012345, 023457, or 024579 would contain six lyne pairs, owing to the number of distinct pairs of hexachords available in each type.

Each such all-partition array contains all the possible combinations of lyne segment lengths to form its aggregates. Table 7.2 is a chart of the seventy-seven possible ways of partitioning twelve parts into lyne segments of various lengths, while Figure 7.3 is a short segment of a four-part array composed of the thirty-four ways of combining lyne segments of various lengths derived from at most four parts.

Since the construction of such arrays by hand is fairly difficult, and because they are easily adaptable for multiple interpretations, Babbitt tended to reuse the same relatively small number of arrays in several pieces. These pieces remain distinct from each other due to the individuality of both lyne projection and aggregate composition, but listeners can often infer 'family resemblances' amongst pieces sharing arrays. All-partition arrays also impose a kind of rhythmic flux on a composition, owing to their constantly changing aggregate shapes. An aggregate containing ten

Table 7.2 The seventy-seven possible ways of partitioning twelve parts into lyne segments of various lengths

Number of parts:											
1	2	3	4	5	6	7	8	9	10	11	12

Segment length:

Segment length	1	2	3	4	5	6	7	8	9	10	11	12
1												1^{12}
2						2^6	$2^5 1^2$	$2^4 1^4$	$2^3 1^6$	$2^2 1^8$	21^{10}	
3				3^4 $3^3 21$	$3^2 2^3$ $3^2 2^2 1^2$	$32^4 1$ $3^2 21^4$ $3^3 1^3$	$32^3 1^3$ $3^2 1^6$	$32^2 1^5$	321^7	31^9		
4			4^3	$43^2 2$ $4^2 2^2$ $4^2 31$	42^4 $432^2 1$ $43^2 1^2$ $4^2 21^2$	$42^2 1^2$ 4321^3 $4^2 1^4$	$42^2 1^4$ 431^5	421^6	41^8			
5			$5^2 2$ 543	$5^2 1^2$ 5421 $53^2 1$ 532^2	541^3 5321^2 $52^3 1$	$52^2 1^3$ 531^4	521^5	51^7				
6		6^2	651 642 63^2	641^2 6321 62^3	631^3 $62^2 1^2$	621^4	61^6					
7		75	741	731^2	721^3	71^5						
8		84	831 82^2	821^2	81^4							
9		93	921	91^3								
10		$10\ 2$	$10\ 1^2$									
11		$11\ 1$										
12	12											

elements in one lyne and two in another will, depending on how lynes are being projected, sound quite different from an aggregate using four trichords, or three tetrachords, or six dyads. The greatest potential difference between two aggregates in a twelve-lyne all-partition array will of course be between the aggregate that is made of a single row in one lyne and that which is made from one element each in all twelve lynes. This difference should also imply the range of possible aggregate composition, from the totally restricted (a single row in one lyne) to the totally free (each lyne having a single element). A couple of vivid musical examples arise in the piano work *Post-Partitions*, where the registral sweep of the opening bars is contrasted in the middle of the piece where an aggregate is projected in the middle octave of the piano; one may also point to a passage heard not long after the opening of *Relata I* (1965), where, after a lot of activity

Figure 7.3 The opening block of a four-part all-partition array

throughout the orchestra, one can hear a trombone slowly and solemnly uttering a long string of notes against a held sonority. Both of these passages absolutely depend on the varying shapes of the aggregates within their arrays.

One additional concept that emerges in this period of Babbitt's music derives from his techniques for transforming an array. It is easy to see how one might perform the familiar twelve-tone transformations of transposition, inversion, and retrogression on an array as a whole, but to this Babbitt added the circle-of-fifths transformation (or multiplication by 5 (or 7), mod 12), and a technique of inverting each distinct lyne pair by the index number (a representation of the inversional axis) that would preserve its hexachordal content. In the former case, the result is an array that preserves all of the distributional aspects of the original, while shifting intervals in predictable ways. This technique is not usually found within a composition but can be seen to relate arrays of two different pieces. The latter case, however, occurs frequently within a given work and can have a dramatic effect on the musical surface.

Inverting an array around a single axis will preserve columnar aggregates but will map the hexachordal contents of lyne pairs onto each other in predictable ways. Inverting each lyne pair by its own axis preserves the hexachordal content of each lyne pair but plays havoc with the columnar aggregates of the array. The result has been called 'weighted aggregates', in that under this kind of transformation what had been an aggregate in the original array can appear with multiples of a given element, and with the loss of other elements. Overall, the content of the array will still contain an even distribution of all twelve elements, but locally the flow of pitch classes will be varied. One of the consequences of this transformation can manifest itself in the sudden appearance of element duplication in the musical surface, articulated as unisons or octaves between those means by which Babbitt is projecting the array lines. A vivid moment of this latter operation may be heard at the midpoint of the Fourth String Quartet (1970), in which a unison A blossoms out in octave doublings in the passages that follow.

Having established a practice based on all-partition arrays, Babbitt moved on to seeing how these themselves could be combined in ever more complex networks of polyphony, referred to as super-arrays. In the orchestra piece *Ars Combinatoria* (1981), Babbitt unfolds four transformations of the work's array simultaneously, articulating once again a version of the list of the fifteen subsets of four, in this case not just of trichords, or individual instruments, but of complete twelve-part all-partition arrays, each presented by its own ensemble drawn from the orchestra as a whole.

Much of the music that occupied him to the end of his career engaged with such counterpoints of counterpoint, at times piling up a dizzying number of simultaneously unfolding strands of music, as in, for instance, his Sixth String Quartet (1993).

Yet, ideas and preferences found in his earliest work may still be perceived in the later music. *The Head of the Bed* (1982) returns to the ensemble of the *Composition for Four Instruments*, used here to accompany a soprano. The ensemble unfolds a super-array based on a frequently reused four-part all-partition array, while the voice part is composed using trichordal arrays disposed as they had been in the earlier work. The super-array is divisible into the fifteen subsets of four elements, here represented by how many of its constituent arrays are present and yielding the same collection of instrumental subgroups found in the earlier work, albeit in a different order.

With relatively few exceptions, Babbitt's catalogue of music displays an ever more complex exploration of the implications of some of his earliest decisions about how to treat pitch within the context of relations amongst aggregates. Register and instrumentation in various combinations form the basis for creating means of distinguishing amongst simultaneously unfolding strands of pitches, be they individual orderings of trichords, hexachords, or the total chromatic, or combinatorial pairs of rows, or complete arrays, or polyphonies of arrays.

Babbitt's treatment of rhythm, however, is a more varied affair. For Schoenberg, traditional ways of thinking about rhythm and metre can be quite easily derived from his roots in earlier practice. Recognisable dance rhythms, waltzes, and marches proliferate throughout his twelve-tone compositions, bringing with them their attendant associations both of affect and of accentuation within the bar. Babbitt, on the other hand, was not so much interested in re-enlivening traditional practice as he was committed to exploring the possibilities inherent in the radically different ways of construing relationships afforded by aggregate composition.

His initial excursions into interpreting these new pitch relationships into the temporal domain dealt with issues of absolute duration, susceptible to the kinds of transformations he was using with pitch. The *Composition for Four Instruments* offers a good example of this, although he had worked with a similar structure in the second of the earlier *Three Compositions for Piano*. Figure 7.4 illustrates the durational pattern composed out in the ensemble work.

While the *Composition for Four Instruments* employed a duration string of only four elements, subsequent works used duration strings derived

Figure 7.4 Duration patterns in *Composition for Four Instruments*

from their underlying twelve-tone rows. The Second String Quartet (1954) is one of the more consequential pieces using this approach. But as may readily be imagined, this kind of translation of pitch to duration is not only a perceptual challenge but is non-commensurate with regard to things like interval preservation under various kinds of transformation. This caused

Babbitt to seek another way of handling issues of time, one that would better afford parallelisms with his pitch procedures.

Babbitt's solution has been called the time-point system (see Babbitt 1962). At its heart is the use of metre to create a cyclical division of time. Just as the perception of octave equivalence allows a cyclical division of register, so in the time-point system the perception of a regular metre creates a series of ever-repeating cycles. If a bar, representing a single module, is divided into twelve attack points, one can construct a temporal analogy for the twelve-note equally tempered realm of pitch. Obviously, there are considerable differences, both abstract and perceptual, between the pitch and time domain, but by using time points as described here, Babbitt was able to make far closer analogies between pitch and rhythm than in his earlier practice (Mead 1987). Figure 7.5 illustrates some of the issues addressed above.

One of the consequences of this approach is the restoration of a more traditional interpretation of rhythm and metre. While in some music of the twentieth century bar lines are reduced to serving as placeholders to help read a score or part, in many time-point compositions it is useful to be able
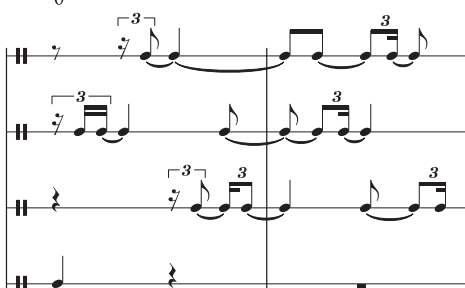

Figure 7.5 Time-point rows and an aggregate realisation

to recognise downbeats, pick-ups, subdivisions of various kinds, and so on. This is not to say that metrical interpretation is not active in earlier Babbitt; in fact, one of the interesting things about the *Composition for Four Instruments* is how tempo and the maintenance of the work's absolute duration scheme interact to offer reinterpretations of large-scale repetitions of patterns. But with the advent of time-point composition, Babbitt's music affords a whole range of engaging metrical interpretation.

One example will serve to illustrate this. The Third and Fourth String Quartets were written within a year of each other but use complementary ways of altering tempo. In the case of the earlier work, a basic pulse present throughout the composition is frequently reinterpreted so that modular length can change from section to section. Some sections are notated in $\frac{3}{8}$, others in $\frac{3}{4}$ or $\frac{6}{4}$, with the underlying eighth-note pulse always constant. Bar length, and thus modular length, changes, and with it the sense of rate of turnover. In the case of the later quartet, the bar length is a constant throughout, but the notated tempo changes. The differences of temporal change between these two works is striking and is due to our way of hearing the modulus in each case.

The use of the time-point system allowed Babbitt to create arrays of time-point rows, usually employing the same array structure found in the pitch domain. And just as the lynes of his pitch arrays are often distinguished by register, so Babbitt turned to dynamics to provide an analogue for projecting time points. Sometimes, this would lead him to use twelve different dynamic levels, but frequently he would use a single dynamic level to project a combinatorial pair of time-point rows, just as a single register might be used to unfold the analogous combinatorial pair of pitch-class rows in his arrays.

This might at first seem to be a kind of false equivalency, but Babbitt was well aware of the inexactness of fit between structures in pitch and structures in time. This led him to adopt a greater degree of freedom in his exploration of the temporal domain over his career. Unlike the pitch domain, the temporal domain in Babbitt's music demonstrates a number of different interpretations. Babbitt devised several different ways of treating time spans and added to these basic techniques a further way of subdividing the spans he created. In many works, a given timespan created by some means or other would be subdivided by some even number of attacks, not all of which would be sounded. The clue to these additional attacks may be heard in how they are realised as pitches. As mentioned above, pitch-class arrays are susceptible to interpretations based on the partial orderings determined by the lyne segments found in any given aggregate. Frequently, Babbitt would use this flexibility to create whole or

partial cross-references to segments present elsewhere in the array. This was by no means his only approach to composing out the aggregates of his arrays, but it was one that appears frequently.

The foregoing is at best an overview of Milton Babbitt's developing approach to composing in the total chromatic and his use of various kinds of analogues to his thinking in pitch in his approach to handling rhythm. Much is left out; there are a number of pieces in which he moves in directions that he does not bring in to his central set of techniques. The underlying approach to constructing both rows and arrays in *Philomel* is never quite followed up in later work, and certain pieces such as *The Crowded Air* (1988) depart quite substantially from the technique of the music that surrounds it. Nor have I touched in any kind of comprehensive way on the variety of strategies Babbitt used to compose out the details of his arrays' constituent aggregates. There is a danger of imagining that Babbitt's composing was in some way algorithmic, that once an array had been selected for pitches and rhythms, and once the parameters for instrumental and registral projection had been determined, then the rest would follow trivially. But this could not be further from the case (see Mailman 2019). Babbitt's compositional technique sets limits on the choices he could make in the process of writing, but it did not make those choices automatically. He once remarked that one the hardest things for him to do in starting a new piece was getting the previous piece out of his mind (personal conversation with the author).

A more fruitful way of thinking about Babbitt's compositional technique is to see it as the creation of a musical space within which he could be creative: the establishment of a set of constraints that allow any given compositional action to have consequences, to create contingencies, to induce echoes of itself that can spread through a work. Just as Schoenberg yearned for a compositional technique that would allow him to navigate the total chromatic in ways that could replicate the structural depth he perceived in the music of Haydn, Mozart, and Brahms, so Babbitt sought ways to explore the implications of Schoenberg's insight into a fundamentally new way of construing notes, not as representations of scale degrees, but as means to individuate aggregates. Furthermore, while Babbitt's compositional techniques grew over his career, their evolution was accretive in that ideas and approaches evident in his earliest published works persisted amidst all of his developments right up to his final compositions. And despite his work with the RCA Mark ɪɪ synthesizer, Babbitt's conceptions of instruments and the voice had strong roots in

traditional performance practice as a way of inflecting the idiosyncrasies of his musical imagination.

In its own way, Babbitt's musical practice echoes the balance between tradition and the avant-garde one finds in Schoenberg's and Webern's music. The difference, of course, lies not merely with the issue of compositional technique, but in what tradition each composer found himself. For Schoenberg and Webern, it was the legacy of nineteenth- and eighteenth-century European practice. For Babbitt, it included a strong European heritage, but one heard from the vantage point of the New World, and it also included a very strong legacy of those Americanisms found in jazz and popular song (Maggart 2020; Brody 1993). Babbitt had an encyclopaedic knowledge of the American Songbook, with firm grounding in Jerome Kern and George Gershwin, and his youthful musical experience growing up in Jackson included not only playing clarinet in the local orchestra but playing in a variety of informal pick-up bands as well. Scholars have likened his approach to his own arrays as having an affinity to the revisiting of lead sheets in jazz as much as they are a new development from the first principles of twelve-tone composition (Mailman 2019). And while Babbitt's music might seem a radical departure from earlier compositional practice, it is by many measures another instance of the American tendency to put together unexpected combinations of influences, just to see what happens.