

## POST-WORLD WAR II CONTEXTS

Just as Boulez wrote of the general feeling after the war of “being faced with nothing,” so Cage compared the situation of contemporary composers to being in “a bombed-out city,” forced to build again from the ground up. Both rejected Neoclassicism, Schoenberg’s integration of twelve-tone music with eighteenth-century forms, and the interwar engagement with popular music, jazz, and folk traditions. Instead of relying on personal taste, expression, and emotion, they and many of their contemporaries were attracted to abstract systems that minimized the role of the composer’s individuality and subjectivity. Thus, while Cage and his circle were inspired by the ancient Chinese *I Ching*, Zen Buddhism, and new abstract styles of painting and dance, the Serialists turned to mathematics, psychoacoustics, and, as we will see in Chapter 11, new technologies.

This was the era of all-encompassing theories that sought to explain human actions in terms of systems. In a 1957 article entitled “Meaning in Music and Information Theory,” the music theorist Leonard B. Meyer argued that systems of probability, expectation, and entropy could model “the seemingly disparate worlds of physical phenomena, bio-social behavior, and humanistic creation.” As a result, he predicted that “the possibility of a statistical analysis of style” would soon lead to “the construction of devices for composing music on the basis of probabilities inherent in the style of western music.” (For one recent realization of this idea in the development of artificial intelligence systems for composition, see Chapter 15.)

As part of composers’ adoption of scientific models of experimentation, they felt compelled to explain what they were doing and why. Many connected their musical works to analytical and theoretical writings, publishing their explanations with the score or in specialized journals like *Die Reihe* (The Row, or The Series) in Austria or *Perspectives of New Music* in the United States. The notion of composition as research made it possible for a piece of music to have more impact through what was written about its compositional techniques than through actual performances. Reviving the model of the composer-theorist, mostly dormant since the eighteenth century, a number of composers established themselves as prominent music theorists, particularly in North American universities, which prized research and publication. In an essay that he called “The Composer as Specialist” (better known by the provocative title “Who Cares If You Listen?” under which it was published in the audiophile magazine *High Fidelity* in 1958), Milton Babbitt likened composition to scientific research, noting that “the time has passed when the normally well-educated man without special preparation could understand the most advanced work in, for example, mathematics, philosophy, and physics.” Just as a layman could not be expected to appreciate the finer points of a mathematics lecture on “Pointwise Periodic Homeomorphisms,” Babbitt argued that it was unrealistic to present highly specialized music in concerts aimed at the general public.

By embracing an experimental, scientific mindset, many composers distanced themselves from the interwar tendency to place music in the service of nationalism, propaganda, and mass culture. The German musicologist H. H. Stuckenschmidt, who had been forced from his journalistic position by the Nazis and then conscripted into the German Army as a translator, wrote in 1947: “For twelve years we have been raised to disrespect and reject the principles of *l’art pour l’art* [art for art’s sake] to the point where many believed that art had no rules of its own.” Babbitt, who taught at Princeton, described universities as “the mightiest of fortresses against the overwhelming, outnumbering forces, both within and without the university, of anti-intellectualism, cultural populism, and passing fashion.” Artists, too, rejected the notion that their work should serve social or political functions. Writing in 1952, the influential art critic Harold Rosenberg described the paintings of the American Abstract Expressionist Jackson Pollock as “a gesture of liberation from Value—political, esthetic, moral . . . *the lone artist did not want the world to be different, he wanted the canvas to be his world.*”

Yet the cultural arms race set off by the Cold War made it harder than ever for composers and artists to avoid politics. As avant-garde music and art came to symbolize the Western liberal values of freedom and individuality (see Chapter 9), significant funding for new music came directly or indirectly from governments in both Europe and the United States. Part of the postwar denazification and reeducation efforts in West Germany included support from the U.S. State Department and military for a wide range of musical activities; Stuckenschmidt himself was hired by the State Department as a cultural ambassador between the United States and West Germany. Perhaps the most striking example is the State Department’s support for the International Summer Courses for New Music that began in the West German town of Darmstadt in 1946, quickly having a substantial impact on musical developments. The State Department’s music officer in charge of the region reported approvingly in 1948 of the emphasis on avant-garde music and the exclusion of older composers associated with nationalism or the folk. “Contemporary music *only* is taught and performed—and then only the more advanced varieties. R. Strauss and J. Sibelius do *not* come into consideration.”

## TWELVE-TONE COMPOSITION AFTER WORLD WAR II

Prior to the war, interest in the twelve-tone method in Europe had been limited to Schoenberg, his pupils, and a few others (see Chapter 7). Although Schoenberg continued to compose twelve-tone works after immigrating to the United States in 1933, he also wrote a number of tonal works, either in response to commissions or in the hope of getting performances. With some exceptions,

including Wallingford Riegger and Ruth Crawford Seeger, few American composers were drawn to the method, in part because little information about it was available in English. This changed in the 1950s, when a number of prominent international figures as diverse as Babbitt, Boulez, Copland, Britten, and Shostakovich demonstrated that twelve-tone techniques could be used to very different stylistic ends than those represented by Schoenberg's music.

The most surprising case was Igor Stravinsky, who had come to be viewed as Schoenberg's antithesis in the interwar years. In a series of works written after Schoenberg's death, including *Canticum sacrum* (1955), the ballet *Agon* (1957), and *Movements* for piano and orchestra (1959), Stravinsky developed his own distinctive twelve-tone idiom. The pointillist texture and floating rhythms of *Movements* evoke Webern's aesthetic, which had a strong impact on many composers seeking alternatives to Schoenberg after the war. The second volume of *Die Reihe* in 1955, marking the tenth anniversary of Webern's accidental shooting death by an American soldier, was devoted to his music and included a foreword by Stravinsky. Illustrating the feeling many had of discovering a misunderstood genius—and thus downplaying the limited but still considerable recognition that Webern had received in the 1920s and 1930s—Stravinsky described him as “a real hero . . . doomed to a total failure in a deaf world of ignorance and indifference, he inexorably kept on cutting out his diamonds, his dazzling diamonds, the mines of which he had such a perfect knowledge.”

## INTEGRAL SERIALISM

Boulez took the lead in championing Webern over Schoenberg in a provocative essay titled “Schönberg est mort” (Schoenberg Is Dead, 1952), published a year after Schoenberg's death. Asserting that it was Webern rather than his teacher who had pointed the way to the future, he dismissed Schoenberg's attempt to combine twelve-tone technique with Neoclassical forms as so fundamentally wrong-headed “that it would be hard to find an equally mistaken perspective in the history of music.” Instead, Boulez praised Webern for having sought in works like his *Symphony, Op. 21* (see Chapter 7) to “derive the structure from the material” and for originating the idea of applying “the serial principle to the four sound-constituents: pitch, duration, intensity and attack, timbre.”

Boulez was one of several postwar composers who extended twelve-tone technique beyond melody and harmony to rhythm, dynamics, timbre, articulation, and texture. This effort, referred to variously as Integral Serialism, Total Serialism, and General Serialism, took different forms depending on the composers' backgrounds and interests. The many problems, the very significant perceptual difficulties, and the unintended consequences that Boulez and others encountered in the attempt vividly illustrate the idea of composition as an experimental process.

## MESSIAEN'S SYSTEMS, SPIRITUALITY, AND MAGIC

A major influence on Boulez, and on the development of Integral Serialism in general, was his teacher Olivier Messiaen (1908–1992). In contrast to those who grounded new compositional techniques in science and mathematics, Messiaen drew upon an extraordinary range of sources, including his fervent Catholicism, synesthesia, the music of India and Japan, and the sounds of birdsong. Messiaen's enormous musical talent gained him entrance to the Paris Conservatoire when he was only 11. Upon completing his studies at age 22, he became organist at La Trinité Church in Paris, a position he would hold for more than six decades. His output includes organ works on religious themes such as *La nativité du Seigneur* (The Nativity of the Lord, 1935), compositions for piano like the massive *Catalogue d'oiseaux* (Catalogue of Birds, 1958), and many orchestral works, in particular the exoticist *Turangalila-symphonie* (1948), which features the electronic Ondes Martenot (see Chapter 5).

Messiaen's most famous piece, *Quatuor pour la fin du temps* (Quartet for the End of Time), was written in 1940–41 in a German prison camp, where he had been sent upon being captured shortly after beginning his military service. Written for the instruments available—violin, clarinet, cello, and piano—the quartet was first performed in the camp for an audience of prisoners and guards. Like many of Messiaen's compositions, the eight-movement work is programmatic, drawing on the New Testament Book of Revelation. In the preface to the score, Messiaen describes the first movement, *Liturgie de cristal* (Liturgy of Crystal): “Between three and four in the morning, the song of the birds, a blackbird and nightingale improvise, a halo of trills high in the trees, they are transported to a religious plane: you hear the silence of the heavens.”

Messiaen nests the flamboyant violin and clarinet parts, each marked to sing “like a bird,” upon a mysteriously timeless accompaniment in the cello and piano. Building on the medieval technique of isorhythm, the cello part is based on a series of 5 pitches and a rhythmic pattern of 15 durations:

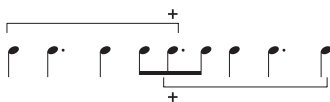
Cello pitch series (5 pitches)

*	*	*	*																
C	E	D	F $\sharp$	B $\flat$ /C	E	D	F $\sharp$	B $\flat$ /C	E	D	F $\sharp$	B $\flat$ /C	E	D	F $\sharp$	B $\flat$	etc.		
4	3	4	4	1	1	3	1	1	1	1	3	1	1	4 / 4	3	4	4	1	etc.
*																*			

Cello rhythm series (15 durations, given in eighth notes)

In the cello part, the pitches and rhythms realign after three statements of the 5-pitch series. The piano part, however, uses more-elaborate patterns, with a series of 29 chords combined with a rhythm that is 17 durations long; since these are prime numbers, the two series would realign only after 493 events.

**Example 10.1:** *Nonretrogradable rhythm from Olivier Messiaen's Quartet for the End of Time, preface, p. III*



That this eventual meeting takes place far beyond the bounds of the actual movement is typical of Messiaen's use of structural devices to symbolize mystical and spiritual realms. Another example of this metaphysical dimension is his interest in symmetrical collections like the whole-tone and octatonic scales, which he described as "modes of limited transposition," and in "non-retrogradable rhythms," or palindromic rhythms that read the same backward as forward (Ex. 10.1). He heard these structures, with their "mathematical impossibilities"—by which he meant, for example, that there was only a single transposition of the whole-tone scale—as possessing a "strength of bewitchment, a magic strength, a *charm*." For Messiaen, such musical devices ultimately symbolized the eternity and boundlessness of God.

The most direct influence on composers of the younger generation involved with the development of Integral Serialism was Messiaen's short piano piece *Mode de valeurs et d'intensités* (Mode of Values and Intensities), one of a set of four études on rhythm written at Darmstadt in 1949. As Messiaen explains in a preface to the score, the piece uses a "mode of pitches (36 notes), of note-values (24 durations), of touches (12 touches), and of dynamics (7 levels)." As shown in Example 10.2, Messiaen divides the material into three overlapping registral layers, or divisions. Each division contains 12 different pitches, and each pitch is assigned a dynamic value and articulation that it preserves throughout the piece.

Messiaen's attraction to systems can be seen in the way he constructs the rhythms of each division by adding rhythmic values (a thirty-second note in Division I, a sixteenth note in Division II, and a quarter note in Division III). He then generates the piece's scintillating traceries of notes from an arrangement of these precisely predetermined elements. While he uses all 12 pitches in each layer, he intentionally diverges from the central tenet of twelve-tone composition by constantly varying the order of each of the divisions, treating them instead as unordered modes, as suggested by the work's title. The new sound world that resulted from Messiaen's techniques, liberated from traditional notions of harmony, meter, and texture, was a revelation for composers like Boulez and Stockhausen.

#### BOULEZ FROM STRUCTURES TO MARTEAU

Ever since he burst onto the scene as an *enfant terrible* around 1950 with his inflammatory writings and astonishing works, Boulez has been a major figure in contemporary music as a composer, conductor, author, and long-time director of

**Example 10.2:** *Olivier Messiaen, Mode de valeurs et d'intensités, analysis by the composer*

I  
 (Division I is used in the upper piano staff.)

II  
 (Division II is used in the middle piano staff.)

III  
 (Division III is used in the lower piano staff.)

Modes intertwined

the musical research center IRCAM in Paris (see Chapter 11). Talented in mathematics and engineering as well as music, he studied harmony with Messiaen at the Paris Conservatoire, followed by private lessons on twelve-tone composition with Schoenberg's pupil René Leibowitz (Leibowitz's *Schoenberg and His School*, published in French in 1947 and in English two years later, was one of the first books to provide details on the twelve-tone method).

Boulez's Second Piano Sonata (1948) first brought him wide attention. Through what he described as an "anarchic" expansion of register, he challenged Neoclassical conceptions of melody, form, rhythm, and texture. His *Structures I* for two pianos (1952) was a milestone in the history of Integral Serialism. Boulez developed the basic twelve-tone row through the standard serial transformations of transposition, retrograde, inversion, and retrograde inversion, but he also constructed a series of 12 rhythmic values, based on the addition of thirty-second notes; a series of 12 dynamic values, from *pppp* to *ffff*; and 12 different types of articulation (Ex. 10.3). The connections to Messiaen's *Mode of Values and Intensities* are clear in his adoption of Messiaen's Division I (see Ex. 10.2) as the row for *Structures*. But whereas Messiaen treated the division as unordered mode, for Boulez the ordered "serial" treatment is fundamental.

Once these series were established, Boulez composed the piece by referring to two 12-by-12 matrices of order numbers. He selected pitches, rhythms, dynamics, and other parameters based on the various sequences of numbers, while making adjustments according to other, less formal criteria (Ex. 10.4). As we will see later, another inspiration for Boulez's use of these tables was his correspondence with John Cage, who precisely at this time was writing his *Music of*

**Example 10.3:** Pierre Boulez, *Structures I*, series of pitches, rhythms, articulations, and dynamics. As presented by Robert P. Morgan.

Order No.	1	2	3	4	5	6	7	8	9	10	11	12
Pitch	E $\flat$	D	A	A $\flat$	G	F $\sharp$	E	C $\sharp$	C	B $\flat$	F	B
Duration												
Attack	>	>	.	$\hat{sfz}$		$\hat{\cdot}$	v	$\hat{sfz}$	$\hat{\cdot}$	-	-	$\hat{\cdot}$
Dynamic	<i>pppp</i>	<i>ppp</i>	<i>pp</i>	<i>p</i>	<i>p</i> <sup>quasi</sup>	<i>mp</i>	<i>mf</i>	<i>f</i> <sup>quasi</sup>	<i>f</i>	<i>ff</i>	<i>fff</i>	<i>ffff</i>

(The absence of an attack at the fifth order number indicates "normal.")

*Changes*, similarly based on charts for the individual musical elements (though to very different ends).

In an analysis of *Structures I* published in *Die Reihe*, the Hungarian-born composer György Ligeti (discussed further in Chapter 12) pointed out the inconsistencies in Boulez's method, as well as the illogicality of "transposing" a series of durations or dynamics: "What is inorganic is this pointless transplantation of a system; note qualities labeled with numbers, the dematerialised numbers organised into tables, and the tables finally used like a fetish." In noting that it would be impossible to reconstruct the compositional process from the sound of the music, Ligeti also raised the question of how Boulez's compositional techniques relate to the listener's perception of the piece. Yet he concluded by marveling at the "beauty in the erection of pure structures" that Boulez had achieved, using language that anticipated the mass effects and textures he would explore in his own music. Ligeti compared the kaleidoscopically shifting surface of *Structures I* to the patterns created by flashing neon lights on a city street: "the individual lights are indeed exactly controlled by a mechanism, but as the separate lights flash on and off, they combine to form a statistical complex."

Boulez's lifelong habit of reworking his older pieces, and his willingness to set techniques aside after he learned what he could from them, exemplify the postwar experimental mindset. He quickly turned away from the procedures used in *Structures I* to a more flexible approach that still built upon elaborate serial techniques. As he was composing his next major work, *Le marteau sans maître* (The Hammer without a Master, 1955), he wrote of feeling the need to constrain the sense of possibility: "The network of possibilities the system offers is not something simply to be presented as sufficient in itself to satisfy the needs of the composition. . . . [W]e might instead regard a piece of music as a series of rejections among many probabilities."

Based on three poems by the French Surrealist poet René Char, *Le marteau sans maître* (see Anthology 17) is a song cycle for contralto and a small ensemble

**Example 10.4:** *Pierre Boulez, Structures I, Part 1c, mm. 1–3*

The image shows a musical score for Pierre Boulez's *Structures I, Part 1c*, measures 1-3. It consists of two systems of piano parts. The first system has a tempo marking "Assez rapide (♩ = 80)" and a dynamic of "ff". The second system also has "Assez rapide (♩ = 80)". The tempo changes to "précipité" in the second measure of both systems. Dynamics range from "pppp" to "quasi f". The notation includes various articulations and slurs.

of flute, xyloimba, vibraphone, percussion, guitar, and viola, which Boulez uses to create what Ligeti described with approval as a “sensual feline world.” The choice of timbres and the floating, static rhythmic quality, signal Boulez’s growing interest in the music of Asia and Asian conceptions of time as an alternative to the linearity of Western temporality: “we are always ready to go from A to B and when we get there through a straight line, we are always very happy because we think that is the best solution. But I like to stop and listen to the sound only, although with a sense for logic and development.”

In part an homage to Schoenberg’s *Pierrot lunaire*, *Le marteau sans maître* features a singer employing a range of vocal techniques from speaking to singing, including Sprechstimme. As in *Pierrot*, each movement calls for a different collection of instruments; Boulez brings in the full ensemble only at the end of the work. Yet, in the context of his essay “Schoenberg Is Dead,” it should come as no surprise that Boulez also intended *Le marteau* as a critique of Schoenberg. In his writings on the piece he contrasted the improvisatory freedom of Schoenberg’s compositional techniques at the time of *Pierrot lunaire* and the emancipation of the dissonance, with what he viewed as the rigidity of Schoenberg’s twelve-tone music. That Boulez was also in essence critiquing the rigidity and limitations of his own efforts to extend the twelve-tone method in *Structures I* is another manifestation of the idea of composition as a kind of research, with each experiment pointing the way to the next.



## BABBITT'S EXTENSIONS OF TWELVE-TONE TECHNIQUE

Among the composers in Europe and the United States who explored aspects of Integral Serialism, Milton Babbitt (1916–2011) has had the greatest impact through his works, writing, and teaching. Babbitt developed his approach to extending the twelve-tone method in tandem with his theoretical investigations of Schoenberg's music. Both his compositional methods and his theoretical writings were influenced by a background in mathematics that was strong enough to earn his first teaching post at Princeton in the Department of Mathematics. Starting with the *Three Compositions for Piano* (1947), which used a twelve-tone row and a series of rhythmic values, with specific dynamics and registers associated with each row form, Babbitt focused on developing "a completely autonomous conception of the twelve-tone system . . . in which all components, in all dimensions, would be determined by the relations and operations of the system."

In "The Composer as Specialist," Babbitt described how each pitch in a work becomes an "'atomic' event . . . located in a five-dimensional musical space determined by pitch-class, register, dynamic, duration, and timbre," the accurate differentiation of which was crucial for intelligible communication. As we will see in Chapter 11, the quest for precision led Babbitt, Boulez, and others to electronic music synthesizers, which offered more precise and quantifiable control over each of the musical parameters than was possible for human performers.

In a series of works composed over six decades, including *All Set* for jazz ensemble (1957), the *String Quartet No. 3* (1970), and *Danci* for solo guitar (1996), Babbitt explored ways of creating large-scale structure through arrays of simultaneously presented rows, and a technique for organizing rhythm using what he called a "time-point system," based on when events occur in a fixed metrical unit.

For some, Babbitt came to represent the epitome of the intellectual academic composer, but his music is often playful and mischievous, as suggested by the many irreverent puns in the titles he chose, such as *Whirled Series* for saxophone and piano (1987) and *The Joy of More Sextets* (1986) for piano and violin. In 2008, the jazz trio The Bad Plus recorded an arrangement of Babbitt's piano piece *Semi-Simple Variations* (1956) emphasizing elements of his style that allude to his background in jazz and musical theater. Indeed, among Babbitt's many students are the prominent jazz musician Stanley Jordan, as well as the noted stage composer and lyricist Stephen Sondheim.