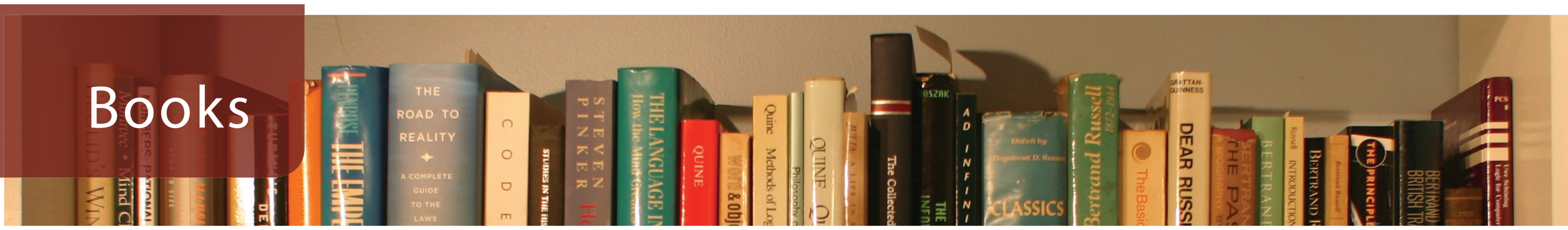


OTHER HARMONY: BEYOND TONAL and ATONAL

by TOM JOHNSON

(Publisher: Editions 73 Two–Eighteen Press; Second Printing edition (Nov 18, 2014))

by MARK ZUCKERMAN

While it may be tempting to sample composers' published recipes for their source material, these may not be good fare for those on low–salt diets. Such is the case with Tom Johnson's *Other Harmony*, though the amount of salt needed may depend on your background and outlook.

The book's subtitle, *beyond tonal and atonal*, is an intriguing promise. There are few musical issues more intensely examined than "tonality" and "atonality." Among the myriad approaches, perhaps the most interesting regards each as a framework to apprehend a piece of music rather than an inherent property of the music itself. From this perspective, as eloquently articulated by John Rahn in his classic *Basic Atonal Theory*, tonality and atonality are filters employed by a listener who experiences a piece of music as "tonal" or "atonal" depending on the filter. How satisfactory the experience turns out depends on how well the filter integrates what's being heard and how well the listener uses it.

The fundamental objective of listening is achieving coherence, from which all other experiential aspects–visceral, emotional, and intellectual–flow. Music emerges through coherence; incoherence is noise. Music theories set forth principles of coherence used in constructing conceptual models for music, either descriptive (i.e., analysis as listening aid–Rahn's "filter") or prescriptive (compositional aid). Musicology provides another approach to illuminating coherence, regarding aspects of tonality and atonality–and their differences–as matters of style based on a wide and deep knowledge of relevant musical literature.

Johnson's approach is entirely different. He introduces the book by describing a debate he observed raging in the late 1960s between two opposing camps of composers: tonalists (as represented by Ned Rorem) and atonalists (e.g., Charles Wuorinen). So what matters is not so much what tonality *and* atonality have to offer as the conflict between them: tonality *vs.* atonality. In other words, the subject isn't experiential, theoretical, or musicological, but political–and in the fashion of current politics, Johnson casts a plague on both their houses:

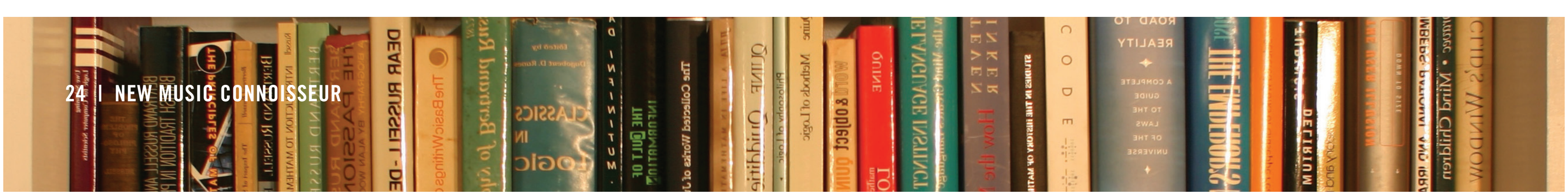
> …Nobody seemed to really notice that all this time Bartok and others were writing fine music without taking a position on one side or the other. I think we finally need a new harmony book that goes beyond tonal and atonal and considers all the Other Harmony that has dominated and continues to dominate music.

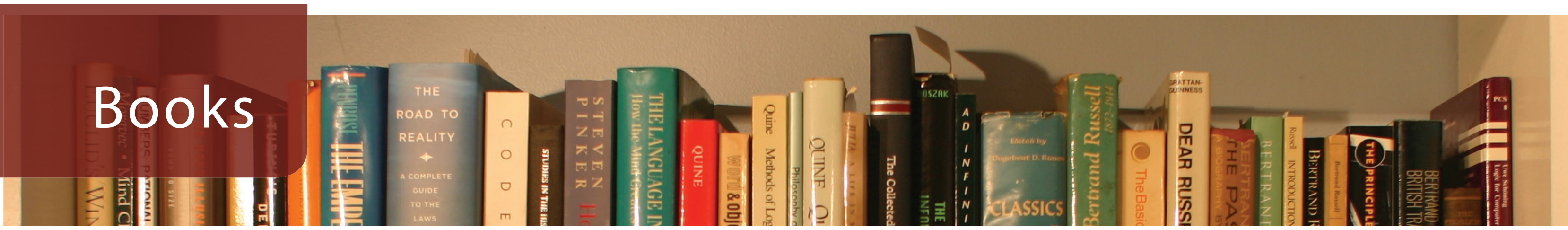
Never mind that Bartók died a good 20 years before this debate purportedly took place and that nowhere does *Other Harmony* attempt to explain Bartók's harmonic practice. Bartók and unnamed others are for Johnson kindred spirits whose compositional process is unencumbered by parochialism–exemplified by tonality and atonality, whatever they may be.

This is an age–old problem typical of the scientific community's attempts to explain musical phenomena, many of which may be based on scientific truths but musical fallacies.

The bulk of the book presents pitch materials generated by a number of different means drawn from Johnson's personal experience as a composer supplemented by his research at the French National Library. The latter he admits was somewhat cursory–reluctant as he was to "become a musicologist" at his stage of life–largely just refreshing his acquaintance with books he had encountered in the past, most of which, unsurprisingly, are unconventional and obscure.

There are chapters on the work of musicians: Josef Matthias Hauer, a contemporary of Schoenberg's who wrote music using tropes, an adaptation of medieval practice. There are several Russians: Nicolas Slonimsky, best known as a musical lexicographer, a supporter of avant–garde music, and a humorist, who theorized about pentatonic collections; Nicolas Obuhow, a composer of the first half of the 20th Century who worked with chords containing the entire chromatic; and Joseph Schillinger, creator of the "Schillinger System" of composition whose best known acolyte was George Gershwin. Schillinger, like Hauer, developed an updated version of a medieval





practice (isorhythm) as well as a catalogue of chords constructed systematically by combining intervals without regard to a tonal reference. (with the emphasis given to Russians, it's curious that Alexander Scriabin isn't included, considering the comparative value of his music and his wider influence.) The best known composer in this collection is Olivier Messiaen, who developed a system of extracting chords from modes whose intervallic construction is such that their content is preserved when transposed. Examples of these are the "whole–tone scale" (Messiaen's Mode 1) and "octatonic scale" (Messiaen's Mode 2); transposing the former by any even chromatic interval and the latter by any multiple of 3 semitones retains the original content. Although Johnson uses Messiaen as an example of Other, this property of his modes is basic atonal theory.

Before we get to these musicians, however, we hear about a mathematician. The 18th Century pioneer Leonhard Euler is known for many wide–ranging contributions, including the invention of mathematical notational conventions and ground–breaking work in number theory, graph theory, logic, physics, astronomy, and applied mathematics. Most of these are still considered fundamental (some even bear his name). His application of mathematics to music theory–creating chords consisting of overtones generated by combining prime numbers–is not one of these. We might well ask why Bach, Handel, Haydn, or Mozart (to name a few contemporaneous composers) did not become Eulerites, but their failure to do so apparently didn't impede the quality of their output nor earn them the reputation for being stodgy.

There are some who speculate that the reason Euler's theory of harmony didn't gain traction was because it was "too mathematical" for musicians and "too musical" for mathematicians, a too generous assessment in keeping with Johnson's that Euler was a pioneer of Other harmony too radical for his time because he threatened "sacred rules." There are two problems with this view: the first is that Euler's harmonics have to be detuned to fit on the equal–tempered chromatic scale that was coming into vogue at the time and is still in use today. This detuning compromises the neat ratios that purportedly generate the notes and are put forth as the basis for the theory's musical rationale. More important, Euler relies on an abstraction of music that fails as a model of musical coherence. This is an age–old problem typical of the scientific community's attempts to explain musical phenomena, many of which may be based on scientific truths but musical fallacies. J.K. Randall's paper *Three Lectures to Scientists* presents cogent analyses of this issue.

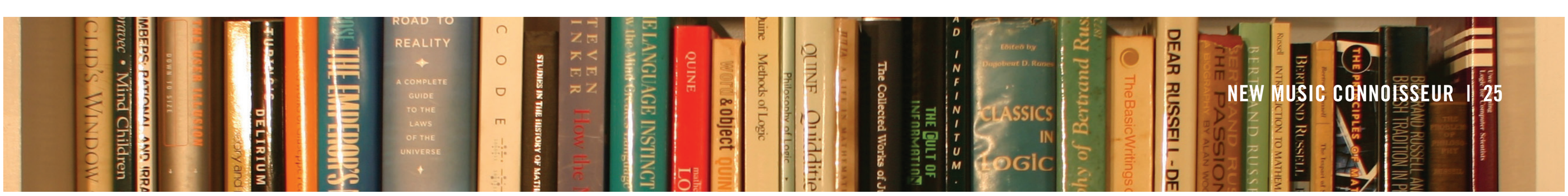
Unfortunately, this problem is the predominant flavor of *Other Harmony*, which holds mathematics in high regard but low insight. The brief chapter on tonality makes passing references to the seminal music theorists Jean–Philippe Rameau and Heinrich Schenker before leaving them far behind, instead extolling the virtues of modern graphical "visualizations" of the tonal system that "give us a much clearer view of what Bach and Beethoven and Brahms were really doing…"–although there are no examples offered to demonstrate the legitimacy of this rather remarkable claim. Graphs play an outsized role in the balance of the book, which demonstrates a variety of methods to generate notes, some algorithmic and others using mathematics largely as gimmickry. The graphs mostly display networks of common tone relationships, some of which are the product of the generating methodology but many are merely a way of organizing the material after the fact.

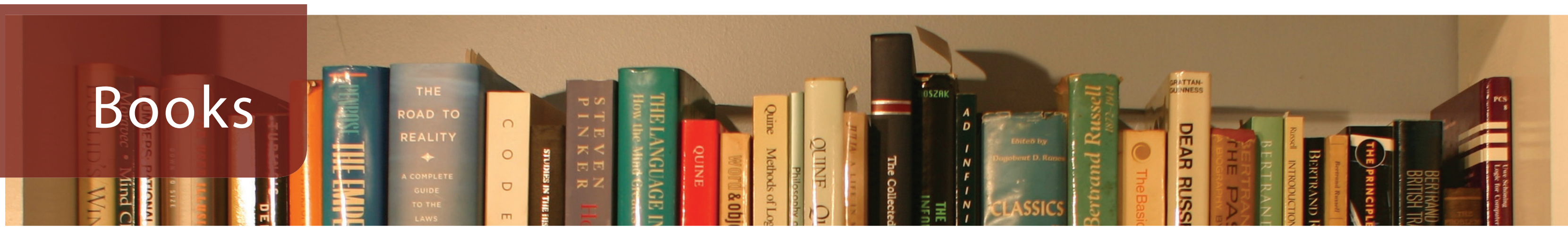
This is not to deny that mathematics can have valuable applications in music theory, especially in creating models for musical dimensions like pitch and making their properties apparent. Milton Babbitt's fundamental articles on 12–tone music (*Some Aspects of Twelve–Tone Composition*, *Twelve–Tone Invariants and Compositional Determinants*, and *Set Structure as a Compositional Determinant*) demonstrate this. Mathematics can also be used to inspire the structuring of musical materials, such as using Fibonacci series to control rhythmic or temporal dimensions.

These are both a far cry from the kind of numerology behind Johnson's chapter Heights and Sums, where we are asked to add the pitch class numbers (not the intervals) of the members of a chord to determine its "height" and to construct collections of chords with the same height. The collection with a "C–major triad" (0,4,7 = 11) would also contain C#–D#–G (1,3,7 = 11), C–F–F# (0,5,6 = 11) and so on. This is certainly "other" harmony (i.e., not tonal and not commonly atonal), but without superimposing another means of organization, how does this means of generating chords relate them musically and suggest a model for musical coherence?

A passage from the beginning of the chapter Sums Modulo N illustrates in a nutshell many of the ingredients of *Other Harmony* that are hard to swallow. Johnson introduces the application of modular arithmetic by partitioning the intervals in the chromatic collection modulo 2: five "even" intervals (0 mod 2) and six "odd" intervals (1 mod 2) and observes:

> At least since Fux, music theorists have tried to agree on how to divide the intervals into a consonant half and a dissonant half, and they never really agree, because it's all a matter of





> opinion, but we can divide the intervals in a completely rational way by simply separating the even from the odd…and this separation is easily found in musical practice…The odd intervals are not always dissonant, but somehow we hear that the two notes do not belong to the same whole tone scale. They are not coming from one world, but are somehow juxtapositions of two worlds. There is something rather rigid and logical and structured about the odd intervals and something softer, smoother, and more mellifluous about the sound of the even intervals, those that come from the whole tone scale.

Once again we are expected to conflate science and music

Although eschewing research required to "become a musicologist," Johnson, here as elsewhere in the book, shows no compunction about making sweeping statements with seeming (but undeserved) musicological authority. That aside, once again music theory is cast as a matter of politics, based on "opinion" rather than a coherent framework. Once again we are expected to conflate science and music: assessing the "consonance" or "dissonance" of an interval in isolation is an acoustic judgment, not a musical one, which depends on context. In classic tonal terms, for example, the interval of 3 semitones can be "consonant" (minor third) or "dissonant" (augmented second); they "sound" the same in isolation but function differently in context. Function is the crucial difference between the musical and acoustic notions of these overloaded terms; in music, consonance and dissonance function in schemes of musical propulsion when they have any meaning at all. Even in theories of what might be called "quasi–tonal" music, as presented in Vincent Persichetti's *Twentieth–Century Harmony: Creative Aspects and Practice*, "dissonance" and "consonance" are subsidiary to patterns of "tension" and "relaxation"–in other words, musical context.

Using modular arithmetic to partition the chromatic is simply a roundabout way of identifying cycles produced by intervals that are integral divisors of 12 (the size of the chromatic collection). The cycle of 2 semitones ("mod 2") is the "whole tone scale"; the chromatic contains 2 of these, each with 6 notes. Likewise, the cycle of 3 semitones ("mod 3") is the "diminished seventh chord", 3 instances of 4 notes each; 4 semitones ("mod 4"), the "augmented triad" (4 instances of 3 notes); 6 semitones ("mod 6"), the "tritone" (6 instances of 2 notes). The cycles of the remaining intervals (1, 5, 7, and 11) reproduce the entire chromatic, since they are not integral divisors of 12; their cycles are, respectively, the transformations of identity, "cycle of fourths," "cycle of fifths", and inversion. All this is fundamental to atonal theory and to 12–tone theory in particular. It provides perhaps a more "rational" way to divide the intervals than merely "separating the even from the odd" and it doesn't rely on vague evasions like "somehow" or "something."

What should we expect of a theory of harmony ("other" or otherwise)? We can start with classic models. Walter Piston's *Harmony*, first published in 1941, is an excellent example, as is the Persichetti, published 20 years later. Both are concerned with how harmony is realized in musical passages. Both develop notions of harmonic function and progression. In other words, both are concerned with matters of musical coherence.

In *Other Harmony*, we are asked to accept a much lower standard for music theory–succession as opposed to progression, no notion of function, coherence seemingly taken for granted–represented as progress. Admittedly, as Persichetti writes, "Only when theory and technique are combined with imagination and talent do works of importance result." But what are the relative contributions of theory, technique, imagination, and talent? Thinking of their work as recipes: for Piston and Persichetti, harmony theory is a source of nourishment, whereas for Johnson, harmony, apparently, is spice. Without some main ingredient, this produces a pretty thin stew, however flavorful (if you can tolerate the salt).

In memory of Steven R. Gerber, composer and friend.