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## "How Equal Temperament Ruined Harmony (and Why You Should Care)" by Ross Duffin

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**Duffin, Ross W. *How Equal Temperament Ruined Harmony (and Why You Should Care)*. New York: W.W. Norton & Company, 2007. ISBN 978-0-393-06227-4.**

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When I first read the title of the book under review here, my reaction was that I (and I assume, others) had never known that Harmony Was Ruined, let alone by Equal Temperament (ET). I expected that Duffin's book would explain How ET Ruined Harmony, preferably after an exposition proving (or at least either demonstrating or suggesting) that Harmony Was Ruined in general, and by ET in particular. It will not come as a surprise that such a discussion is missing. In fact, I believe that such a discussion is impossible, simply because both Harmony and Ruin are such flexible, undefined, imprecise, and vague concepts that one can prove anything, which is of course equivalent to proving nothing. One could even say that Duffin's book shows that Harmony was not ruined at all by ET, since there still happen to exist true connoisseurs who know that ET is not the system that dictates musical intonation today, and that it has never dictated it. According to the book's index, there is only one page that deals with the relation between ET and Harmony: p. 18, the half-page that concludes the book's Prelude. There it is stated that "harmony has been compromised by the exclusive use of ET in performance"—but this statement is contradicted by the rest of the book.

In fact, this book has a different subject. Duffin does not like ET and the book was written to justify this opinion. I might respond by saying, "then just do not use it yourself, and ignore the undiscerning majority that is obviously happy with it." The author, however, sees it as his duty to inform that majority that they are on the wrong path. Duffin accomplishes this task in ten chapters of approximately ten to fifteen pages each, following a rough historical order. After two chapters that provide a brief outline of the theory and problems of tuning and intonation, eight chapters follow that deal with specific aspects of those subjects, always associated with a number of authorities. Chapter Three, for example, discusses ideas promoted by Peter Preleur, Pier Francesco Tosi, Leopold Mozart, and Johann Joachim Quantz concerning large and small semitones used in non-keyboard tuning. Chapter Eight discusses violin intonation that deviates from ET with reference to statements by Joseph Joachim, Pablo de Sarasate, and Alphonse Blondel.

All of the chapters have a common message: that there are countless, alternative options to ET as far as tuning, temperament, or intonation are concerned. I couldn't agree more. And it is certainly true, too, that when tuners or musicians say they are applying ET, the result probably is

at least a little imperfect, if not only because of the inherent inaccuracy of the tuning process or of the conditions in which the instruments are used. There is no string quartet that performs all of its music in strict ET. In general, I do not believe that music produced on instruments without fixed tuning (including the wind instruments) can follow ET or any other prescribed system--a belief universally confirmed by empirical intonation studies. It is fortunate that such is the case, because the notes are produced for our ears, not for measurement equipment. Viewed from this point of view, ET cannot have Ruined Harmony, by the simple fact that it does not exist in musical practice. Any prescriptive theorizing in this field is hampered by the fact that there is no just or standard intonation for the most often used melodic intervals, the major and minor seconds. Practical intonation is always the result of compromise between melodic and harmonic requirements, which themselves involve compromise.

Duffin's book seems to be based on two mutually exclusive points of departure. On the one hand, he maintains that several, if not most, great composers of the past (including at least Bach, Mozart, Beethoven, and Brahms) favored tunings other than ET. In accordance with this, he quotes a continuous stream of references to non-ET intonation throughout the history of music, from the eighteenth century to the present day. On the other hand, Duffin maintains that ET is used universally and that we should drop it in favor of other, flexible systems. It seems to me that both positions cannot be true at the same time.

There are more problems. A tuning system is not normally a specified aspect of a musical composition; there are very few works that describe the tuning to be used in performance. I believe, therefore, that in performance the tuning system used must not be the focus of attention or be perceived as an entity unto itself. The music should simply sound in tune, whatever tuning has been applied. That is all. If one can 'hear' the tuning, something is wrong. If the tuning is unequal, it will make some chords and tonalities sound different from others. Some will sound better than average, others less so. Does the music justify that? And will the public know (and accept) that parts of the performance sound less in tune than others, or at least different? In performance, a tuning system must, I believe, be a 'hidden' factor. Musicians should tune their music according to its own requirements.

A problem with Duffin's book is that it alleges there to be an opposition between ET and non-ET that I believe is unjustifiable. One cannot divide the world in two halves, half with ET and half without. Given the incompatible goals of simultaneously tuning well intervals with a factor 3 in their basic ratios (the fifth, etc.) and those with a factor 5 (the major third, etc.), there is a myriad of possibilities for a satisfactory tuning system. ET is one possibility, and through its particular properties it has become (and rightly so) what one might call a reference system, a model. As even Duffin is willing to concede, ET is a system that places all conceivable notes in a very simple grid. Teaching basic musical skills on the basis of a non-ET tuning would be a very complicated matter. In addition, ET is the only way in which one can (in theory) perform all intervals, chords, and tonalities in such a way that no particular coloring occurs at any given point. Whether one likes that or not, it is undeniable. So tuners and performers will, in many

cases, take ET as a point of departure, and I cannot see what is wrong with that. If they do not like the result, they will certainly use something that differs from ET.

Although it has some scholarly characteristics and pretensions, Duffin's book certainly cannot be considered a treatise. It is written in a light, personal style, including a lot of anecdotal details and informal reasoning. Some key concepts are discussed in separate 'boxes' (separated from the main text by horizontal lines), and most of the authorities quoted receive a short biography in similar boxes. Cartoons have been added to emphasize the lightness of tone. But footnotes and literature references have been provided in an absolutely satisfactory way. There is a very good index at the end of the book. The typography is admirable and sophisticated.

Even if one disagrees with the general tenor of the book, one must acknowledge that Duffin knows his subject matter. It is a pity, therefore, that he perpetuates Murray Barbour's false conception of the mean tone as a major second that is half the size of a major third.<sup>1</sup> Little thinking is required to see the absurdity of this statement: if it were true, ET and Pythagorean tuning would also be mean-tone tunings. In fact, a mean tone is simply a mean tone, the geometric mean between the major whole tone (frequency ratio 8:9) and the minor whole tone (9:10), or  $\sqrt{(9/8)(10/9)} = \sqrt{5/4} = \frac{1}{2}\sqrt{5}$ . This is the major second of what is often called "quarter-comma mean-tone" temperament, but this temperament is in fact the only one that has such a mean tone. Mean-tone tuning is a single tuning system, not a class of systems. Tunings characterized by temperings of the fifth by other amounts than one-quarter of the syntonic comma are not mean-tone temperaments. The correct use of the term "mean tone" as given above was introduced in the history of tuning and temperament by Robert Smith in his book *Harmonics, or The Philosophy of Musical Sounds*<sup>2</sup> (Duffin's first authority, incidentally).<sup>3</sup> It is equally regrettable that Duffin adheres to Bradley Lehman's totally speculative "Bach tuning."<sup>4</sup> (I cannot see why a composer would choose to design a sophisticated tuning system, then tell it to no one--so that his music would never be played in the intended tuning--but merely encode it in a monogram, risking the possibility that no one ever would decipher it.)

It is difficult to say whether I would recommend this book or not. It contains valuable insights, but perhaps musicians should simply figure out what tuning to use themselves rather than be told to adhere to a particular system, or to avoid another one.

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<sup>1</sup> Ross W. Duffin, *How Equal Temperament Ruined Harmony (and Why You Should Care)* (New York: W.W. Norton, 2006), 34.

<sup>2</sup> Robert Smith, *Harmonics, or The Philosophy of Musical Sounds* (London, 1759), 48-9.

<sup>3</sup> Duffin, *How Equal Temperament*, 42-3.

<sup>4</sup> *Ibid.*, 148.