Tatlow’s latest book examines proportions as an integral part of Bach’s compositional process and the reasons behind his commitment to achieving those proportions.

Mathematical principles have been applied to music since the teachings of Pythagoras. Music theorists, musicologists and musicians regularly use mathematical tools in tuning systems, meter, periodicity and the analysis of musical forms. The full appreciation of the compositional outputs of Debussy, Bartók or the Second Viennese School is hardly conceivable without a thorough understanding of their underlying mathematical principles, be it a Reihe or a set of Fibonacci numbers. It is thus not surprising that the significance of numbers and proportions in Johann Sebastian Bach’s oeuvre has also attracted scholarly attention.

Bach’s first biographer, Johann Nikolaus Forkel, wrote with perhaps slightly exaggerated enthusiasm that his era ‘was a period … when one believed that all expression and all beauty in art depended solely on the mathematical proportions of tones’ (1788). Interest in the mathematical nature of Bach’s compositional technique flared up in the twentieth century, in particular from 1947 onwards, with Friedrich Smend’s highly influential number alphabet theory.

Ruth Tatlow has devoted her academic career to researching numeric relationships within Bach’s works. Her doctoral dissertation, revised and published as Bach and the Riddle of the Number Alphabet (CUP, 1991), revisited and critiqued the numerological speculations of Smend and others, and challenged the notion that numerology or cabbalistic techniques play a
major role in Bach’s works. She has argued that it is the *proportions* between sections, movements, whole works and even complete cycles—rather than specific and often symbolic *numbers*—that Bach, in his search for divine harmony, considered essential. Tatlow’s latest book, which summarises her research of the last twenty years or so, examines proportions (expressed in numbers of bars) as an integral part of Bach’s compositional process as well as the reasons behind his commitment to achieving those proportions.

The first part of the book offers a comprehensive survey of eighteenth-century writings on music theory and theology, as well as biographical sources that discuss musical proportions, symbolic numbers and symmetry. This provides a useful summary of the historical background. While familiarising the reader with the potential intellectual influences on Bach’s musical development, Tatlow introduces the concept of ‘proportional parallelism’, the investigation of which propels Part Two from the analysis of one composition to the next. The author’s claim that ‘all the collections and multi-movement works that Bach published or left in fair copy demonstrate the characteristics of proportional parallelism’ (p. 367) is nothing short of daring. She identifies three such characteristics:

1) The bar counts in Bach’s printed works or fair copies are multiples of 10, 100 or 1000.
2) The letters of the composer’s name as a quasi-signature, whereby each letter is assigned a numerical value according to its place in the alphabet (A=1, B=2, C=3, etc.), are alluded to in the total number of bars in each work or can be traced in the overall key pattern within a complete cycle.
3) Most significantly, the total number of bars within a larger compositional structure can regularly be divided into multiple layers of 1:1, 1:2 and occasionally other proportions.

Of the three characteristics, the first and third can be consistently detected. With respect to the second, the B-A-C-H signature does appear with some frequency, but by no means in all the finished works. For example, it simply cannot be found in the Cello Suites (BWV 1007–1012) or the Harpsichord Concertos (BWV 1052–1058). Potentially problematic are also instances where only three of the four letters are represented: for one thing, they plainly spell B-A-C and not B-A-C-H. Moreover, the key signatures of B, A and C (major or minor) are not particularly extraordinary, and a claim for special significance is thus more difficult to sustain.

One of the most important conclusions of Part One is that for Bach it was important to create proportions close to unity (1:1). This would contribute to God’s universal harmony and ensure that the finished compositions ‘would last not only for posterity, but for eternity’ (p. 98). While the author considers the historical background and its agreement with her analytical results indispensable (p. 33), this may not necessarily be the case; her scholarly proposition is so bold that it can be judged on the dependability of her statistical research data alone.

The second half of the book is devoted to hands-on ‘Demonstrations’ of the hypothesis that Bach consistently strived to achieve numerical perfection through bar numbers in his finished compositions, fully aware that such perfection could never be heard in real time due to the changes in time signature and tempi of individual movements. This theory is tested on some twenty or so collections from the Violin Sonatas and Partitas (BWV 1001–1006), the Cello Suites and the four volumes of the Clavier-Übung to the great oratorios—a large enough cross-section to assess the reliability of such a striking thesis. Whether proportional parallelism ever became ‘a self-evident practice to any composer living in Bach’s time and locality’ (p. 6) is debatable; however, as far as Bach’s output is concerned, this book certainly produces noteworthy conclusions.
At its best, Ruth Tatlow’s painstaking investigation presents an astonishing trove of new information. Her analysis of proportional relationships between the Ascension and Easter Oratorios (BWV 11 and 249), with their self-referential bar number total of 1400 and several internal 1:1 or 2:1 proportions, is utterly convincing. Similarly, it is hard to doubt compositorial premeditation behind the identical totals of 2400 bars and several matching proportions of the Violin Sonatas and Partitas and the Six Violin Sonatas (BWV 1014–1019), despite the fact that in the former these numbers work without, while in the latter with repeats only. This is not a shortcoming of the investigation as it was the composer’s choice, and with this proviso the round numbers and proportions are worth taking into account. The author’s well-documented reconstructive work shows that in the Six Brandenburg Concertos (BWV 1046–1051) an already working set of parallel proportions was destroyed by a copying error, before the set was enlarged (mostly through the creation of the mighty cadenza in BWV 1050) and revised with a completely new set of round numbers and parallel proportions into its form known to us today.

Tatlow’s remarkable results are, however, occasionally hindered by slight inconsistencies, some of which could have been caught by a more thorough editing process. Most of these errors are inconsequential, but some—for example, when numbers in a table slip into the wrong column and fail to add up (the end columns on pp. 188 and 244)—do cause confusion. Of greater concern are the few instances when the internal structure of a composition appears to be misrepresented for the sake of demonstrating an appealing set of proportions. A clear example is the case of ‘the ten chorales’ (according to the table caption on p. 311) of the St John Passion (BWV 245), which can be beautifully paired from the opposite ends (No. 1 with 10, 2 with 9, 3 with 8 and so on), with each pair adding up to 28 bars and the five pairs totalling the self-referential number 140. Yet this compelling outcome is somewhat spoiled by the fact that there are not ten but eleven chorales in the St John Passion. The last chorale is almost, but not completely, left out of the calculations, as it is added, without a convincing explanation, to the column ‘Recitatives’, thereby assisting them to add up to the important (and otherwise unachievable) total of 670 bars (p. 312). Certain terms such as *lusus ingenii* or *progressio arithmetica* are frequently used as if they were generally known expressions, which makes fluent reading and understanding of the book, particularly Part One, difficult. Similarly, the reading flow is often impeded by footnotes omitting page numbers when referencing tables or the Appendix.

These problems notwithstanding, the core of Tatlow’s theory is sound, resoundingly presented and offers a thought-provoking contribution to Bach scholarship; its conclusions can be considered on their own and lend themselves to practical use when a choice has to be made from several alternative versions (for example, in the case of the French Suites or the St John Passion). The author’s apparent attempt to claim universal validity of the theory for all of Bach’s works may strike readers as over-ambitious, but Bach’s interest in achieving proportional parallelism is evidenced on plenty of occasions. When that is only partially true, it is not necessarily a reason for concern. The internal proportions in only four of the harpsichord concertos (BWV 1052–1055) can be called perfect without hesitation (p. 364). Does it matter that ‘perfection’ does not apply to the full cycle, or that there is no numerical reference to Bach’s name? To most of us, it does not.

In a book that covers so many years of research and includes well over a hundred tables featuring complex calculations and proportions, it is perhaps unfortunate but understandable if a few errors slip in. They can and surely will be rectified in a second or paperback edition, which will make this book an organic part of modern Bach scholarship.

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