Meantone Temperaments on Lutes and Viols. By David Dolata. Bloomington: Indiana University Press, 2016. [xx, 280 pp. ISBN 978-0-2530-2123-6.]

Volume 24 (2018) No. 1

By Herbert W. Myers*

1. Layout of the Argument

1.1 It is common knowledge among historians of performance practice that the use of equal temperament was normal on fretted instruments in the sixteenth to eighteenth centuries, in contrast with the standard use of unequal forms of temperament on keyboard instruments during the same period. And the complaints of early writers concerning the difficulties of intonation caused by these divergent practices are also well known. But much less well known is the fact that some players of lutes and viols did go to the trouble of adjusting their frets to ameliorate at least some of the defects of equal temperament, despite the difficulties this entails. A number of the best modern players have chosen to follow their practices in the interest of greater consonance; Dolata's book is designed to encourage other players to emulate them, providing both theoretical and practical information to aid in this quest.

1.2 The book is divided into three parts, each designed to be read

independently: “Precedence,” “Theory,” and “Practice.” This organization means the discussion of the historical use of different intonation systems precedes the detailed explication of those systems, as found in the second major section; for this reason the author suggests the reader who is unfamiliar with tuning theory read the second section first. While this organizational approach may have its advantages for some readers, it does engender a considerable amount of otherwise unnecessary repetition.

1.3 In his opening chapter (the first of three under “Precedence”), Dolata examines the written record concerning the historical use of alternatives to equal temperament on fretted instruments. Despite the comparative paucity of solid evidence, he clearly establishes that such alternatives were in common use among some players, but he is less successful, I believe, in making his case that equal temperament was generally associated with amateurs and unequal systems with professionals. (Such a position is hard to justify when, for instance, one of the chief proponents of equal temperament was none other than Galileo’s father, Vincenzo Galilei, whose attainments as both a lutenist and theoretician were unassailable.) Unfortunately, his inclusion of some faith-based reasoning (“surely they must have …”), opinion (“most … solo repertoire [for lutes] sounds better … in meantone”), and excuses for the paucity of historical evidence has the effect of weakening rather than strengthening his arguments. Further weakening his scholarly credibility—at least for some readers—is his decision not to include the original text of quotations of historical sources in foreign languages; these are presented only in English translation.

1.4 In Chapter 2 Dolata reports on the physical evidence as embodied in surviving fixed-fret instruments, which consist of numerous citterns, but only a couple of the orpharion/bandora family (the latter being the most relevant to the lute). These wire-strung instruments exhibit different unequal temperaments, with varying tendencies towards meantone. In Chapter 3 he takes up the thorny issue of iconographic evidence—thorny because the evidence itself is so unreliable: it is rare to find an artwork whose creator took

the pains to reproduce faithfully the details of fret placement, even when the artist has bothered to render most other instrumental characteristics fairly accurately. Nevertheless, there are a few examples that exhibit such care, and, as Dolata points out, one can sometimes glean useful information even from flawed pictorial representations (although conclusions drawn from these will necessarily remain controversial).

1.5 Dolata's section on theory consists of two chapters, "Inside the Numbers: How Tuning Systems Work and Why We Need Them" and "Tour through Tuning Systems." The first of these, as the title suggests, details the problems inherent in combining just intervals, the solutions available through small adjustments to the purity of these intervals (temperament), and the construction of tables of intervals expressed in terms of cents (hundredths of a semitone)—the language of smartphone tuning apps. The second treats of the various systems of tuning and temperament employed historically.

1.6 In the third section Dolata deals with the practical issues involved in applying the theory learned in the previous section. Turning first to "Physical and Environmental Factors" affecting tuning, he discusses stringing options in terms of materials and methods of attachment and stresses the role of fresh strings and frets in promoting good intonation. In "The Zen of Tuning" he takes on the challenges of choosing and applying unequal temperaments to fretted instruments. The crux of the problem is this: in order to provide the standard choice of accidentals, some frets would have to run "zigzag"—clearly impossible with tied-on frets. There are a number of solutions (or partial solutions) available to the player: slanted, double, or split frets; "tastini" (small partial frets, taped on or otherwise attached in addition to the tied-on frets); and "pushing" or "pulling." ("Pushing" involves dragging the string at its point of contact with the fingerboard towards the bridge in order to lower the pitch; "pulling" means dragging it towards the nut in order to raise the pitch. These latter techniques allow adjustments to intonation "on the fly.") None of these solutions is quite perfect, and they require some planning and calculation for optimal effect, particularly when the lutenist wishes to match

one of the irregular temperaments favored by many keyboardists.

1.7 Dolata's penultimate chapter treats of the strategies for good intonation available to the continuo player (particularly the player of archlute or theorbo), whose options are greater than those of performers of set pieces, since in playing continuo one has the freedom to choose where on the fingerboard to place chords and how to configure them. His final chapter examines issues specific to viols, whose players have much greater "real time" control of pitch than do those of plucked instruments; in order to exploit this flexibility to the fullest, gambists must continually analyze the musical function of the notes they are playing and make appropriate adjustments to their pitch. Following this are two appendices detailing how to program the tuning app Cleartune, in case the reader should feel the need to create a custom temperament.

2. General Observations

2.1 Dolata writes in a congenial and engaging style, using current idioms and clever wordplays to enliven the treatment of what can be a rather dry subject; this attractive style is marred only by a tendency towards repetitiousness, only part of which can be ascribed to his decision (mentioned above) to make the major sections of the book capable of being read independently. Complementing his visual illustrations (figures, diagrams, photographs, musical examples) are a number of aural examples in the form of audio files, accessible via the web; these range from simple intervals to complete pieces, demonstrating the effect of using different tunings and temperaments.

2.2 While Dolata's information and explanations are for the most part accurate, he does make a few dubious assertions. From even a cursory examination of a working instrument with frets, we see clearly the diminishing distance between them as they progress towards the bridge; this diminishment (regular with equal temperament; irregular with unequal systems) is, of course, the result of their following a geometric progression. But Dolata twice (p. 52 and again on p. 58) ascribes the decrease in distance

to the effect of "sharpening"—the phenomenon whereby the actual pitch produced at a fret is higher than the calculated pitch because of the stretching of the string as it is depressed towards the fingerboard. "Sharpening" (as thus defined) is certainly a real factor in placing frets for the best intonation, but it is not the cause of the general diminution in spacing, which is both theoretical and actual. Oddly enough, this apparent misunderstanding does not affect the outcome of Dolata's calculations, since these are not made in terms of fret positions *per se* but rather in terms of setting temperaments on an electronic device; one is expected to "please the meter" with one's fret positions rather than calculating those positions physically.

2.3 Dolata promotes another misconception with his praise of quarter-comma meantone for its "clearly etched key colors" (p. 110); in fact, as long as one stays within the bounds of "good" keys for meantone, there is no difference in color among them. This is true as well for the less extreme versions of meantone (fifth-, sixth-, and eighth-comma) promoted by Dolata, who misleadingly calls them "extended meantone temperaments." While it is true that these are more easily "extensible" (since, as the size of the portion of the comma extracted from the fifths decreases, so does the distance between enharmonic pairs, making it easier to bridge the gap), to call them "extended" implies—incorrectly—that they inherently contain more "good" keys. One still needs to work to extend them; it's just that the goal is more easily attainable.

2.4 Dolata seems confused regarding the stringing of viols; he claims in one place (p. 133) that the choice "is among gut, its variants, and metal strings," contradicting himself later (p. 208) in stating that the choice is "between or a combination of some variety of plain or modified gut and overspun strings." His misleading reference to "metal strings" would not be worth mentioning but for the fact that it perpetuates a myth among many modern players, who refer casually to any strings overspun with metal as "metal strings," regardless of the material of their cores. Metal-core strings are in any case rarely used on gambas.

2.5 Dolata's acoustical explanations are generally clear and correct, although a physicist might object to his occasional misuse of certain technical terms. (And his statement [p. 134] that gut "is a complicated but pure sound [*sic*] that resonates better with the wood than do synthetic strings" is certainly one more typical of a musician than a scientist!) However, he is mistaken in his claims (pp. 79–81) that the overtones of a plucked string represent "pure" (that is, exactly harmonic) intervals above the fundamental. Only with an "ideal" string—one having no stiffness—would the upper partials be truly harmonic; real strings always possess some stiffness, which shifts the overtones upwards from their theoretical frequencies (the amount of shift being dependent upon the material and construction of the particular strings).

2.6 All considered, these errors are comparatively minor. While Dolata's book is aimed primarily at lutenists and gambists, the wealth of information he provides is of potential value to performers and scholars outside this limited circle. In particular, those who perform with—or conduct—lutenists and gambists can profit from learning what is involved in setting up fretted instruments in unequal systems. And Dolata's chapters explaining why temperaments are necessary, how they work, and how they were used historically are among the most reader friendly available; they can serve as a useful resource for keyboardists and others wishing to understand and manipulate temperaments. That his approach is directed towards the use of electronic tuning apps makes them particularly relevant to current tuning practice.

*__Herbert W. Myers__ (hwm@stanford.edu) is Lecturer in Early Winds at Stanford University, from which he holds BA, MA, and DMA degrees; he is also curator of Stanford's collections of musical instruments. As a member of the Concert Ensemble of the New York Pro Musica from 1970 to 1973, he toured extensively throughout North and South America, performing on a variety of early winds and strings; currently he performs with The Whole Noyse and Jubilate. He has contributed articles and reviews to numerous

journals, as well as chapters to Early Music America's *Performer's Guide*s to early music. For the academic year 1967–1968 he was awarded a DAAD grant to measure instruments in German museums. His designs for reproductions of Renaissance winds have been used by Günther Körber and Charles Collier.