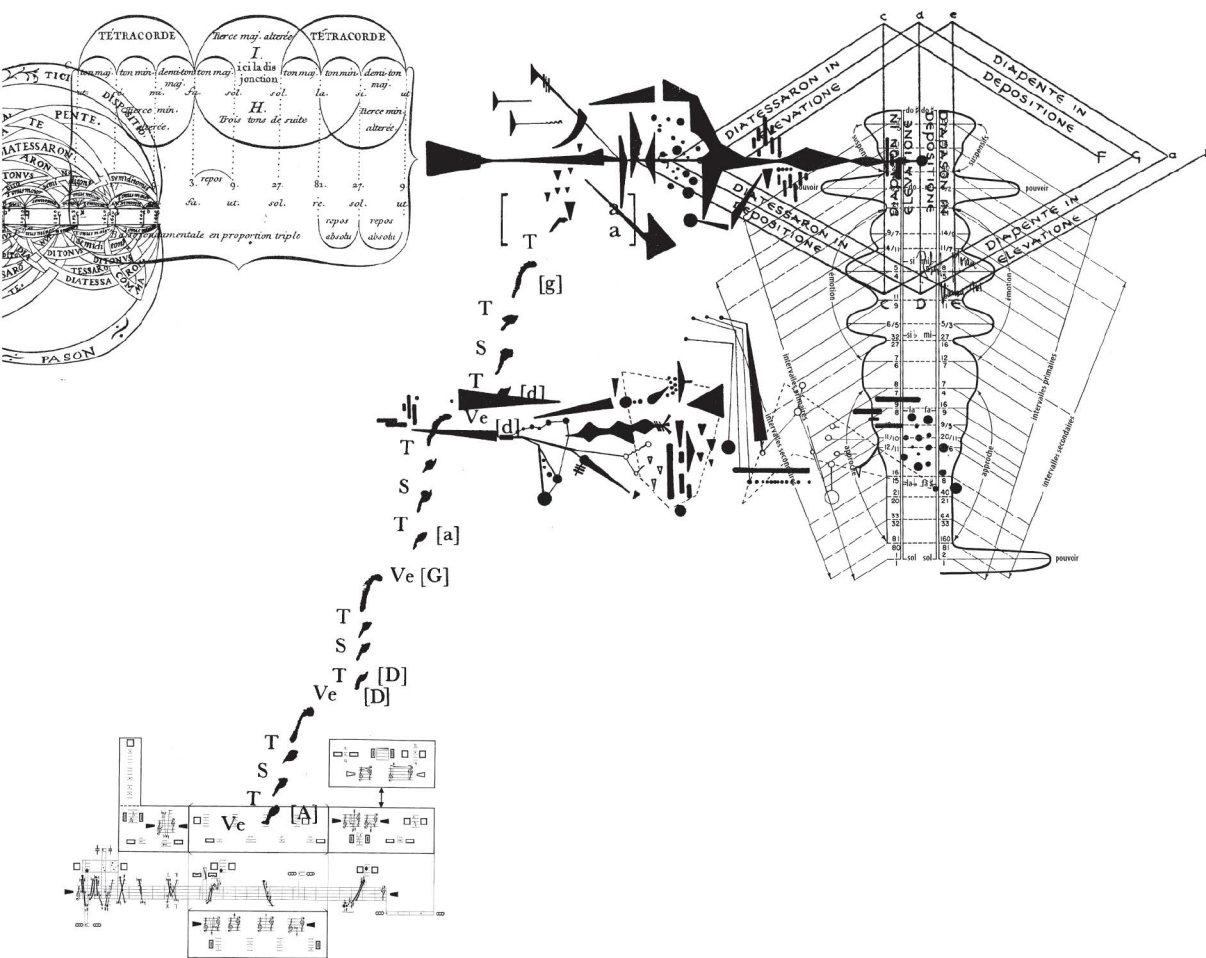


# Experimental Affinities in Music



Paulo de Assis (ed.)

# Experimental Affinities in Music

Edited by Paulo de Assis

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# “Viertönigkeit” instead of Microtonality

## The Theory and Practice of Sixteenth- and Seventeenth-Century “Microtonal” Music

Martin Kirnbauer  
University of Basel

Preliminary remark: this text stems from a lecture given in June 2011 at the conference *Mikrotonalität—Praxis & Utopie* (Microtonality—Praxis and Utopia), which took place at the Staatliche Hochschule für Musik und Darstellende Kunst in Stuttgart; this, in turn, was based upon my contribution to the 2011 International Orpheus Academy, “Viertönige Musik’—Performance Practice of Chromatic and Enharmonic Music in the 16th and 17th Centuries.” Both events featured performances of a number of the music examples by Johannes Keller on a “cimbalo cromatico”—that is, a harpsichord with twenty-four keys to the octave—accompanied by the soprano Gunhild Lang-Alsvik and the violinist Eva Saladin.<sup>1</sup>

“Microtones” and “microtonality”—both the words themselves and the concepts behind them—are a phenomenon of recent music history, as a brief glance in a music dictionary demonstrates: the 1967 *Riemann Musik-Lexikon* does not recognise the term, for example, and “Mikrotöne” only appears in the first edition of Bärenreiter’s *Musik in Geschichte und Gegenwart* as a translation of the English term “microtones” (in reference to the works of Edgard Varèse, among others). In contrast, the *New Grove* (2001) has a whole article on the term; although this includes a pragmatic definition (“Any musical interval or difference of pitch distinctly smaller than a semitone”), it also suggests that the use of microtones in Western art music is above all a phenomenon of the twentieth century (with reference to composers such as Julián Carrillo, Alois Hába, and Charles Ives) (Griffiths, Lindley, and Zannos 2001, 16:624–25). There is further material under the headword “quartertone,” a comparatively restricted form of microtonality, and one that Klaus Huber describes as simply an extended or

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<sup>1</sup> These important live recordings can be heard online at <http://www.orpheusinstituut.be/en/experimental-affinities-in-music-repository>

compounded version of the semitonal “panchromaticism” that he criticises;<sup>2</sup> but here, too, the evidence only begins at the end of the eighteenth century.

The view that microtonality is a modern phenomenon is primarily conceptually motivated. The terminology itself already implies that the idea is based around a constitutive “whole tone” (from the Greek τόνος), which is then made smaller (Greek κρῶς, “small” or “narrow”). The basic major scale of Western music already contains not only “whole tones” such as major seconds (C–D, D–E, F–G, G–A, and A–B) but also minor seconds (E–F and B–C), which are referred to as semitones. If these semitonal steps—which are inherent in the system, and thus “natural”—are carried over to the remaining degrees of the basic scale, the result is a scale that is already potentially “microtonal,” since it is indeed made up of “smaller whole tones,” in this case *semitones*. That might seem pedantic, but in fact it has great practical relevance. This is evident from a glance at the keyboard of a modern grand piano, a structure that still exerts a decisive influence upon the way we imagine music. Here, the “natural” basic scale is provided by the seven (white) lower keys, while the five (black) upper keys represent the “artificial” semitones.<sup>3</sup> Although the black and white keywork separates the two in both position and colour, it nonetheless shows a division of the scale into equal semitones; but this can only be achieved within an equal-tempered tuning system, in which all intervals of a tone are defined to be exactly the same size. Quarter- and third-tone scales also presuppose equal-tempered tuning; although this concept is present in sixteenth-century music theory, it was only in the nineteenth and early twentieth centuries that it gradually established itself in practice.<sup>4</sup>

As soon as we leave behind the beautifully ordered but monochrome world of the keyboard, with its seven white and five black keys and its equal temperament, and change the size of one of these intervals—perhaps when a semitone is stretched to be a leading note, or when a pure and untempered interval is needed—then we are immediately left with a “microtone” that cannot be represented on this keyboard. The seven degrees of the scale (C, D, E . . .), along with the sharpened and flattened forms (C#, D#, E# . . . and Cb, Db, Eb . . . , as well as double-sharps and double-flats) allowed by notation, are mapped onto only twelve keys, and thus only twelve degrees that can actually be heard. Originally, however, the manifold possibilities for chromatic alteration offered by notation were not just quirks of musical orthography; rather, each corresponded to a different pitch.

Thus, although before the end of the nineteenth century there was no microtonality in the sense of artificial divisions of the whole tone, used freely like blocks in a construction set, it was taken for granted that there were distinc-

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2 See Huber (1999), especially “Nähe und Distanz: Zum Streichtrio ‘Des Dichters Pflug’” (224–34) and “Für einen lebendigeren Orgelklang: Stimmungssysteme, Temperatur, Mikrotonalität” (83–88).

3 As an aside, it should be noted that this historically justified keyboard layout, which dates back to the late fourteenth century, is actually not very well suited to the music of later centuries; hence the appearance of proposed reforms such as the “Jankó keyboard,” none of which, interestingly, have ever caught on. But that is another topic.

4 As well as the more well-known titles that are relevant to this topic, reference should be made here to Di Veroli (2008) and to two further original contributions: Duffin (2007) and Eck (2010).

tions to be made between the small and large semitones produced automatically by certain temperaments, and between those and even smaller intervals (those referred to as *dieses*, for example), all of which were called for in a wide variety of contexts. To capture this phenomenon, which is above all a practical one, I use the term “vieltönig” (which perhaps can be translated as “multitonal” in the literal sense of using many pitches).<sup>5</sup> This is used to refer to any pitch system with more than twelve real notes or pitches to the octave, regardless of its theoretical motivation. Although it does not correspond to any historical terminology any more than “microtonal” does, “vieltönig” vividly captures the practical consequences of these systems—demonstrated, for example, by historical keyboard instruments with divided black keys (so-called split sharps), or with expanded keywork (see figure 1).<sup>6</sup> This Italian harpsichord from 1606 has thirty-one keys to the octave; an inscription on the name-board states the possibilities that this opens up: “Clavemusicvm Omnitonvm / Modvlis Diatonicis, Cromaticis, et Enarmonicis / a docta manv tactvm.” This can be translated as “A musical instrument with keys for all notes that can ‘modulate’ in the diatonic, the chromatic and the enharmonic, if it is played by a skilful hand” (the *claves* in “Clavemusicum” are at the same time verbatim the keys that unlock this kind of music).



Fig 1.

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- 5 See Kirnbauer (2013), which also provides more detailed discussion of a number of the examples given below.
- 6 Museo internazionale e biblioteca della musica Bologna, inventory no. 1766.

With the keywords *omnisonum* and *modulis* on the one hand, and the concepts of the diatonic, the chromatic, and the enharmonic on the other, we already have two of the essential ingredients of historical “Viertönigkeit.” The first is concerned with the very practice-oriented field of tunings and temperaments and hence with the precise allocation of notes and scales to fixed pitches; transposition and modulation also play a part, as does an interest in just intonation—the use of mostly untempered pure intervals. While this area has certainly been the subject of extensive theoretical reflection, it is first a practically relevant element of musical performance, one that can also have implications for composition. The second ingredient of Viertönigkeit is the interest in ancient (above all Greek) music and music theory, with its so-called genera of the chromatic and the enharmonic, among others. This is structural in its effect, with immediate consequences for musical composition.

SONARE FUOR DI STRADA—SPLIT SHARPS AND VIERTÖNIGE  
KEYBOARDS

Historically speaking, the first reason to increase the number of notes per octave was required both for purposes of tuning (on the basis of non-equal temperaments) and to transpose a piece of music into a different pitch. Music of the fifteenth and early sixteenth centuries generally stayed in one key, with little or no use of accidentals. However, when a vocal ensemble was accompanied by an organ, problems could easily result, depending on the pitch that the singers wanted to start from and the transposition that would thus be needed, or on the presence of more extended modulations in the music—a problem which Girolamo Diruta (1609, 4:6) described very neatly as “sonare fuor di strada,” or “playing off the track.”

It is well known that the impossibility of reconciling pure intervals (particularly the fifth and the major and minor third, central to European music) with the purity of octaves, which could not be destabilised, necessitated the practical solution known as temperaments. In the sixteenth and seventeenth centuries, the period under discussion here, a very common and widely circulated temperament was so-called mean-tone, in which thirds were kept as pure as possible and fifths were made correspondingly smaller.<sup>7</sup> Regardless of the various possibilities and practical techniques that it generated, one aspect of this tuning system is central here: in mean-tone temperament, there is an emphatic difference between the two versions of the same pitch reached by sharpening and flattening, respectively. So, for example, a G<sup>#</sup> (as a major third above E) is different in pitch from an A<sup>b</sup> (as a minor third above F), as a comparison of their cent equivalents illustrates (figure 2).

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7 The literature on this subject is plentiful; the reader is referred here only to Lindley (1987).

	Mean-tone	Equal	Just
C	0	0	0
C#	76	100	71
D <sup>b</sup>	117	100	112
D	193	200	204
D#	269	300	275
E <sup>b</sup>	310	300	316
E	386	400	386
E#	462	500	
F <sup>b</sup>	427	400	
F	503.5	500	498
F#	580	600	590
G <sup>b</sup>	620.5	600	610
G	696.5	700	702
G#	772.5	800	773
A <sup>b</sup>	814	800	814
A	889.5	900	884
A#	966	1000	977
B <sup>b</sup>	1007	1000	1018
B	1083	1100	1088
B#	1159	1200	
C <sup>b</sup>	1124	1100	
C	1200	1200	1200

Fig. 2.

Here a kind of *Vieltönigkeit* is revealed that is all but inherent in the system. It can be realised on keyboard instruments through the use of additional “split” keys; on other instruments, which do not rely on fixed scales, the intonation can be adjusted accordingly using changes of fingering or embouchure. Evidence for expanded keyboards—and thus for the real-world availability of *vieltönige* tunings based on more than twelve keys per octave—is found from around 1450 onwards, and particularly after 1550; it is most clearly documented up to around 1650, but examples continue in the 1700s and even as far as 1850.<sup>8</sup> At that point, however, the musical world seems largely to have resigned itself to the limitations of the twelve-key (and hence twelve-pitch) system—a situation that also highlights the triumph of the pianoforte, whose capabilities in this respect are severely constrained.

<sup>8</sup> These run from the keyed monochord of Conrad von Zabern in the 1400s to “enharmonic organs” such as that described by Thomas Perronet Thompson or the “enharmonic piano” built in 1864 for Prince Vladimir Fyodorovich Odoyevsky; for an overview—by no means exhaustive—see Wraight and Stembridge (1994); Ortgies (2003); Barbieri (2008).

Evidence is found comparatively frequently for keyboards with fourteen keys—the two additional keys usually being assigned to G<sup>#</sup>/A<sup>b</sup> and D<sup>#</sup>/E<sup>b</sup>—as well as for those with sixteen, nineteen, twenty-four, and even thirty-one keys. The nineteen-pitch instrument depicted in Gioseffo Zarlino’s *Le istituzioni harmoniche* (1558) is today called a “cimbalo cromatico” (figure 3); it offers a complete set of split sharps, as well as additional keys between the semitones of the white keys E–F (for E<sup>#</sup> or F<sup>b</sup>) and B–C (for B<sup>#</sup> or C<sup>b</sup>).<sup>9</sup> The name of the “cimbalo cromatico” already implies the second aspect of *Viertönigkeit* mentioned earlier—its tendency to refer back to the music of antiquity.

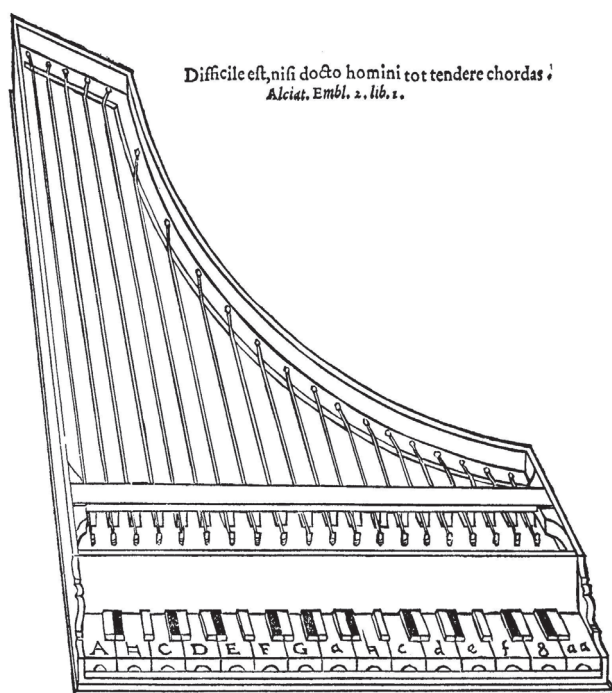


Fig. 3.

*L'ANTICA MUSICA RIDOTTA ALLA MODERNA PRATTICA—  
NICOLA VICENTINO AND VIERTÖNIGKEIT*

While certain aspects of ancient Greek music theory remained influential throughout the Middle Ages, passed on through treatises, from the fifteenth century onwards a growing interest in this body of knowledge can be observed, provoked (among other things) by the rediscovery of manuscripts that had formerly been lost (see Palisca 1985). As part of this process of looking back, which today tends to be associated loosely with humanism or the Renaissance, there

<sup>9</sup> For a proposed systematic terminology, see Rasch (2002, 21–33); for other similar instruments, see Wraight (2002, 105–36).

were also practical attempts to revive certain elements of ancient music (as far as it was understood at the time). The background for this revival was formed (in part) by reports passed on from antiquity, telling of music’s legendary powers—powers that were quite obviously lacking in the music of the time.

The elements of ancient (i.e., Greek) music that thereby came under scrutiny included the so-called diatonic, chromatic, and enharmonic genera. In very rough terms, these describe the arrangement of pitches within the interval of a fourth, in the so-called tetrachord (see figure 4). The diatonic genus (from the Greek *διάτονος*, moving “by tones”) is made solely of “natural” steps in the sequence semitone–tone–tone (for example, E–F–G–A). The chromatic genus (from the Greek *χρωμα*, “colour”) was seen as the “coloured” genus, with the sequence semitone–semitone–minor third (for example, E–F–F#–A). The enharmonic genus (from the Greek *ἐναρμόνιος*, set in the “harmonia”) fills in the tetrachord with two microintervals called the *pyknon* (meaning “dense”) and a major third (for example, E–Ex–F–A).<sup>10</sup> The ancient Greek theory of the genera is fairly complex (and the details of its practical usage are not wholly clear), but that is irrelevant for what follows; here what is important is the way that composers of the sixteenth century dealt with it.

One of the most influential figures in the attempted rehabilitation of the genera was Nicola Vicentino (1511–1576/77), whose text *L’antica musica ridotta alla moderna prattica* was published in 1555 in Rome.<sup>11</sup> The practical orientation of this text is evident even in its title: in full, it is “Ancient music restored to modern practice, with an explanation and examples of the three genera and their nature, and the invention of a new instrument, in which is contained the most perfect music, with many musical secrets.”<sup>12</sup> The text also contains the few surviving compositions in this style by Vicentino, which show how his approach might be emulated; almost all his remaining works, including a series of published madrigal collections, have been lost or survive only fragmentarily.

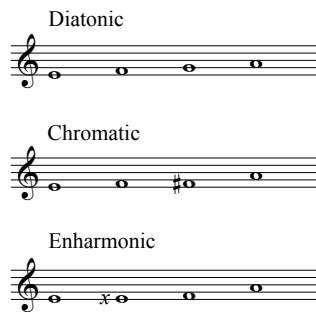


Fig. 4.

<sup>10</sup> In this article, “x” is used to denote the enharmonic *diesis*; this should not be confused with the modern usage of the symbol “x” for a double sharp.

<sup>11</sup> See the excellent English translation and introduction by Maria Rika Maniates (Vicentino 1996), as well as Cordes (2007).

<sup>12</sup> *L’antica musica ridotta alla moderna prattica, con la dichiarazione, et con gli esempi de i tre generi, con le loro spetie. Et con l’inventione di uno nuovo stromento, nelquale si contiene tutta la perfetta musica, con molti segreti musicali.*

One example of his style is the four-part madrigal “Musica priscat caput,”<sup>13</sup> a succinctly programmatic composition, which eulogises the dedicatee of the book, Vicentino’s patron Cardinal Ippolito (II) d’Este, while also demonstrating the possibilities of the three genera.

Musica prisca caput tenebris modo sustulit altis  
Dulcibus ut numeris priscis certantia factis  
Facta tua, Hyppolite, excelsum super aethera mittat. (Vicentino 1555, fol. 69v–70v)

Ancient music of late has raised her head out of the darkness,  
So that, with antique and sweet numbers, to compete with ancient deeds,  
Your great deeds, Hyppolitus, she might send high above the heavens. (Vicentino  
1996, 218n86)

Although the first section uses only “diatonic” intervals, in the second section (from bar 16) the intervals of the chromatic genus come into play; it is no coincidence that this accompanies the word *dulcibus*, conjuring up the particularly “sweet” tonal qualities of “ancient music”—which, for Vicentino, means ancient Greek music. The last section (from bar 31, see figure 5) opens with a prominent textual nod to Cardinal Ippolito, whose glorious deeds happened to include his energetic support of Vicentino’s ancient music revival. It ends by presenting enharmonic and chromatic elements such that the melodic progressions in each voice, which (with their abrupt “microtonal” shifts) might sound bizarre by themselves, nonetheless combine to create harmonically pure sounds.

This kind of music was highly sought after as a sort of musical avant-garde in learned Italian circles, but also north of the Alps (certainly in France and Germany, as demonstrated by the Académie de Poésie et de Musique founded by Jean-Antoine de Baïf in Paris, or the court of Albrecht V, Duke of Bavaria, where Orlando di Lasso was writing similar music). It was music for a select few, and it is no coincidence that Vicentino was one of the first to use the term “musica reservata” to describe chromatic and enharmonic music “used to praise great personages and heroes for the benefit of refined ears amid the private diversions of lords and princes” (Vicentino 1555, fol. 10v; 1996, 33; *frali priuati sollazzi de Signori e Principi, ad uso delle purgate orecchie in lode di gran personaggi et Heroi s’adoperauno*). As well as its status as something intended exclusively for an educated and powerful elite, interest in this music also stemmed from its reputed ability to stir listeners’ emotions. One important demonstration of this is the 1565 Council of Trent’s decision, during discussions about the reformation of church music, to ask Vicentino to write a mass in the chromatic style (Lockwood 1957, 348–50).

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13 For the lecture-recital, the madrigal “Madonna il poco dolce” was chosen—“a confused mixture,” as Vicentino puts it, “of three types of genera in accordance with the words . . . as an experiment in mixed genera” (1555, fol. 68r, my translation; *misto delle spetie di tre Generi confusi, & misti, in proposito delle parole . . . per far esperienza della Musica mista*). The enharmonic elements of “Musica prisca caput” can be heard in an audio extract in Wild (2014); they remain exhilarating even for jaded twenty-first-century ears.

Martin Kirnbauer

26

pri - scis cer - tan - ti - a fac - - tis fac - ta tu - a

pri - scis cer - tan - ti - a fac - tis fac - ta tu - a Hyp -

pri - scis cer - tan - ti - a fac - - tis fac - ta tu - a

pri - scis cer - tan - ti - a fac - tis fac - ta tu - a

31

Hyp - po - li - te fac - ta tu - a Hyp - po - li - te ex -

po - li - te fac - ta tu - a Hyp - po - li - te ex -

Hyp - po - li - te fac - ta tu - a Hyp - po - li - te ex -

Hyp - po - li - te fac - ta tu - a Hyp - po - li - te ex -

37

cel - sum su - per ae - the - ra mit - tat fac - ta tu - a

cel - sum su - per ae - the - ra mit - tat fac - ta tu - a Hyp -

cel - sum su - per ae - the - ra mit - tat fac - ta tu - a Hyp - po -

cel - sum su - per ae - the - ra mit - tat fac - ta tu - a Hyp - po -

43

Hyp - po - li - te ex - cel - sum su - per ae - the - ra mit - tat.

po - li - te ex - cel - sum su - per ae - the - ra mit - - tat.

li - te ex - cel - sum su - per ae - the - ra mit - tat.

- li - te ex - cel - sum su - per ae - the - ra mit - - tat.

Fig. 5.

Figure 5. Nicola Vicentino, *Musica priscat caput* in *L'antica mvsica ridotta alla moderna prattica* (Vicentino 1555, fol. 69v–70v).

The significance and influence of Vicentino’s ideas should not be underestimated, even though he himself was ultimately unsuccessful, his music has largely been lost, and only a few musicians have composed anything that follows his system strictly. He opened the door to an entirely new musical world, and this door, once opened, has left behind audible, viertönige traces. For Vicentino’s concrete application of ancient music to modern practice could actually be described as revolutionary, in that it dramatically expanded the gamut of pitches available to music. Before this point, accidentals were customary only in the context of “musica ficta,” which allowed certain diatonic pitches to be raised or lowered from time to time; after Vicentino, any tone could be altered, even by microintervals, as demonstrated by a “musical hand” with solmisation steps in Vicentino’s text (figure 6) (Vicentino 1555, fol. 12v). This “mano della diuisione del tono in quattro Diesis Enarmonici” is viertönig in a very literal sense: it results in many different pitches. All these pitches could be used by a musician or composer—an important step away from musical tradition and from the vocabulary that was normally available to a musician.



Fig. 6.

The second important aspect arises directly from this: Vicentino also put his novel musical ideas into practice, arranging for the construction of instruments that could realise them (and adding blueprints for some of them to his treatise): an “archicembalo” and “arciorgano,” each with thirty-one pitches to the octave (figure 7).<sup>14</sup> These instruments took the reservoir of viertönige pitches seen in the “musical hand” and spread it out vividly in front of the musician, making it concrete, tangible, playable, and audible. But Vicentino and others

<sup>14</sup> Reverse of a medallion of Vicentino, attributed to Alessandro Vittoria; this specimen from the Gabinetto Numismatico e Medagliere delle Raccolte artistiche, Milan, inventory no. 1093.

also spoke about conventional instruments—alongside appropriately trained voices—that could portray this *Vieltönigkeit* equally well. Alongside violins and trombones, particular mention was made of violas da gamba, because they likewise could make the expanded gamut of pitches easily playable through the addition of extra frets (see Kirnbauer, forthcoming). In each case, the use of specially constructed instruments, or appropriate playing techniques, allowed notated and audible pitch to match each other—the *Vieltönigkeit* apparent in the notation could actually be heard.



Fig 7.

*PER IL CURIOSO MUSICO*—VIELTÖNIGE MUSIC, ASCANIO MAYONE, FABIO COLONNA, AND DOMENICO MAZZOCCHI

The following section presents a few examples of the wide variety of ways in which composers handled the possibilities of *Vieltönigkeit*, and their increasing presence in apparently conventionally composed and performed music.

Vicentino’s expansion of the pitch space available to musicians, which also overlaps to some extent with the “systemic *Vieltönigkeit*” of mean-tone temperament, was subsequently taken up and explored further. Thus in the second half of the sixteenth century we find music that draws upon Vicentino in a variety of different ways, continuing his line of thought but without any reference to him, and treading this newly expanded tonal space in at least a rudimentary way.<sup>15</sup> Prime examples of this are the “*Madrigali cromatici*” (explicitly named as such) printed from 1554 onwards, written by Cesare Tudino, Giulio Fiesco, Lodovico Agostini, and Gioseppe Caimo. Some of these treat the chromatic tetrachord as a *soggetto*, while others make freer use of the chromatic pitches

<sup>15</sup> See James Haar’s still seminal contribution “False Relations and Chromaticism in Sixteenth-Century Music” (1977).

that were now available. In particular, though, it is the madrigal composers of the last third of the sixteenth century who progressively expanded the available pitch space; these included (to name only the most famous) Cipriano de Rore, Luca Marenzio, and Carlo Gesualdo. They used every imaginable alteration of pitch as the occasion dictated, with an enormous influence on the development of our tonal language.

While “chromatic” elements, in the literal sense of the Greek genera, eventually found their way into the common musical language (as is well known), that language remained very limited in its integration of genuinely “enharmonic” elements. This is in part due to the oft-expressed difficulties involved in taking out of their “natural context” the microintervals that are partially present in mean-tone temperament and using them as melodic elements in a polyphonic texture. Here dissonances can only be avoided by abrupt pitch shifts in every part at the same time<sup>16</sup> or by ensuring that microintervals are only used as melodic decoration in a single voice. In addition, such practices need the support of an instrument that can play all the required pitches—not to mention a musician with the necessary training. For enharmonic music, that means an instrument with thirty-one pitches to the octave, a very expensive purchase even at that time. In reality, however, an instrument of this kind also opened up wholly new musical possibilities and inspired composers to write previously “unheard-of” music.

An interesting example of this is provided by the short pieces commissioned from the Neapolitan composer Ascanio Mayone (c.1565–1627) by the scholar Fabio Colonna (c.1567–1640) and published in the latter’s treatise *La Sambuca Lincea* (1618, 92).<sup>17</sup> In the text Colonna presents, among other things, his design for a keyboard instrument with thirty-one pitches to the octave, using Mayone’s pieces as examples of the musical possibilities of the instrument and of the revived Greek tetrachord, “to make by emulation not only other examples, but with more affect and with more beauty” (Colonna 1618, 92, my translation; ad emulatione affatigarsi non solo à farne de gli altri regolati, ma più affettuosi, & belli) (see figure 8 a–d).

The pieces approach these possibilities in a variety of ways, sometimes taking a more free and economical approach (“Compositione confusa nelli tre gen[er]i” [ibid., 98]), and sometimes adhering carefully to the structure of the chromatic and enharmonic tetrachords (as in the two examples marked *intenso* [ibid., 94–95]).<sup>18</sup> It is notable that in each piece at least one voice has a textual underlay, taken from Kyrie eleison or Stabat Mater; although they are meant primarily as examples, they nonetheless make reference to a real musical situation in which they might be used. Finally, one particular characteristic of this process is visible in a short example given to demonstrate an effect described in the text as *strisciate* (verbatim “to drag”), whereby a voice slides up or down

16 One well-known example of this is found in the chanson “Je suis tellement amoureux” by Antoine de Bertrand (1578, fol. 8).

17 See Barbieri (2008, 393–440).

18 *Intenso* and *molle* relate to the different sizes of the microintervals, probably in the sense of strings that have been stretched more tightly (*intenso*, “tight”) or less so (*molle*, “soft”).



Fig. 8a



Fig. 8b

Figure 8. Musical examples by Ascanio Mayone in Fabio Colonna, *La Sambuca Lincea* (Colonna 1618): (a) *Stabat mater*—"Compositione confusa nelli tre gen[er]i" (98); (b) *Kyrie eleison*—"Esempio dell'Enarmonico intenso con 4. Parti" (94); (c) *Kyrie eleison*—"Esempio del Cromatico Intenso nel Soprano conforme l'ottocordo" (95); (d) unnamed piece, illustrating the effect described by the text as "una strisciata di voce inalzata" (102).

**98 Della Sambuca**  
Del Diatonico non se ne pone essemplio per esser cosa volgare, & facile come habbiamo detto di sopra, ma differente dalla vsuale diatonica. che tiene Chromatico misto nelli tasti neri.  
Compositiōe confusa nelli tre geni.

Stabat mater dolorosa iuxta crucem lacrimosa  
dum pendebat hinc illius Al-

This musical score is for a piece titled 'Della Sambuca' (Fig. 8c), numbered 98. It features a complex system of notation on a five-line staff, where notes are represented by diamond-shaped symbols. Some symbols are solid black, while others are hollow or have an 'x' inside. The notation is organized into measures by vertical bar lines. Below the staff, there are several lines of text in Italian, which appear to be lyrics or descriptive text for the piece. The text includes 'Stabat mater dolorosa iuxta crucem lacrimosa' and 'dum pendebat hinc illius Al-'. The overall appearance is that of a historical manuscript page.

Fig. 8c

**102 Della Sambuca**

This musical score is for a piece titled 'Della Sambuca' (Fig. 8d), numbered 102. It uses the same diamond-shaped notation system as Fig. 8c. The notation is organized into measures by vertical bar lines. The piece appears to be a single melodic line. The overall appearance is that of a historical manuscript page.

Fig. 8d

in minute steps; Colonna characterises this as “not dissonant but pleasurable” (ibid., 101–2, my translation; non dissonante anzi diletteuole). The effect could have emerged directly from playing around with the multitonal keyboard; in this context Colonna calls upon “the curious musician” (il curioso musico) to experiment further on his “Istromento perfetto” for the sake of musical enrichment (ibid., 101).<sup>19</sup> Colonna himself provides an example of this in the form of an “example of the circulation of the enharmonic, chromatic, major semitone, and tone degrees” (ibid., 103, my translation; Esempio della circolazione delli gradi Enarmonici, & Chromatici, Semituoni maggiori, & Tuoni)—a fully notated cyclic composition, which modulates through all thirty-one pitches before returning to its starting point (ibid., 103–10).<sup>20</sup>

*Strisciare di voce* is a well-documented vocal technique; it has since become known as portamento, and is not generally seen as connected with Vieltönigkeit. But we can find an impressive example of just this connection in the works of Domenico Mazzocchi (1592–1665). In his “Lamentum Matris Euryali,” for example, the lament of a mother for the heroic but painful death of her son (Mazzocchi 1638, 153–56; see figure 9),<sup>21</sup> a special symbol (V) in the vocal part indicates that the singer is to perform a specific kind of *messa di voce*, a “gradual rise in the breath and pitch of the voice, exactly halfway to the aforementioned symbol *x*, as is found in the enharmonic genus” (ibid., 180, my translation; *messa di voce, che è l’andar crescendo à poco à poco la voce di fiato insieme, e di tuono, & è specie della metà del sopradetto x, come si pratica ne gli Enarmonici*). The symbol “*x*,” which incidentally also appears in the pitches and even figures of the basso continuo, represents the microinterval provided by the vieltöniges keyboard—and Mazzocchi makes explicit mention of these keyboards when he refers to “today’s instruments with perfectly split keys” (ibid., 181, my translation; nell’Instrumenti hodierni perfettamente spezzati).

19 “Then the curious musician will be able to practise by means of similar examples, and gain greater profit from study and exercise, and find other beautiful consonances, because these will not be absent on the perfect instrument, with which he can wander through every kind of musical genus, simple and mixed; but thus far it seems better to us that other genera help to enrich Diatonic music, and alter it in time and place” (Colonna 1618, 101, my translation; Potrà dunque il curioso musico esercitarsi da simili esempi proposti, e far con lo studio, & esercizio maggior profitto, & trouar delle altre consonanze belle, che non vi ne mancaranno per l’istromento perfetto, con il quale può andar vagando in ogni sorte di geno de musica semplice, & misto; ma fin hora il seruire delli altri geni per arricchire la musica Diatonica, & alterarla à tempo, & luoco ne par miglior).

20 For more on these cyclic compositions, see Rasch (1997–99).

21 For a more detailed discussion, see Kirnbauer (2013, chap. 1).

MATER EVRYALI. Cantatur, vt scribitur, rigorosè.

Vnc ego te Euryale a spicio? tu ne illa fenestra  
 sera me requies? potui linquere fo-lam Crudelis? nec te tanta pe-  
 ricula missum Af-fari extremum mi-ferè data copia matri? Heu, terra igno-ta canibus data  
 preda La-tinis, Ali-ti-busque ia-ces? nec te tua fune-ra mater Produ-xi, pressuè

Fig. 9

PER IL CIMBALO CROMATICO—AN “EXTRAVAGANT” SONATA BY GIOANPIETRO DEL BUONO

Another piece that makes use of the visible and tangible possibilities of a vieltoniges keyboard is Gioanpietro del Buono’s “Sonata VII: Stravagante, e per il cimbalo cromatico,” published in 1641 in Palermo (del Buono 1641, fol. [M1v–M2v]; figure 10). Each movement in this collection is based upon the cantus firmus *Ave maris stella*, which the composer uses to demonstrate his contrapuntal skill. In this context, the description *stravagante* is a keyword: it refers not to extravagance or fantastical eccentricity but rather to a composition with some kind of special melodic, rhythmic, or harmonic feature—in this case, a bold exploration of chromatic and enharmonic effects. The possibilities of the cimbalo cromatico are also fully exploited (with sixteen pitches used in total here, including E $\flat$  and D $\sharp$ , A $\flat$  and G $\sharp$ , C $\sharp$  and D $\flat$ , F and E $\sharp$ ), even though the

Sonata VII. Strauagante, e per il cimbalo cromatico.

G.P. Del Buono (1641)

\* B M.14,4: written f(♯) / \*\* B T.15,5: note missing / \*\*\* B M.20,5: written B

21

25

30

35

39

\* C Final note written a third too high

Fig. 10

Figure 10. Gioanpietro del Buono, "Sonata VII. Stravagante, e per il cimballo cromatico," in *Canoni, Oblighi et Sonate in varie maniere sopra l'Ave Maris Stella* (del Buono 1641, fol. [M1v–M2v]).

cantus firmus actually prevents any distant modulations. Here the vieltöniges keyboard seems to allow new combinations of sounds to spring to the composer's mind.<sup>22</sup> Even a close analysis of all the false relations, chromatic respellings, and passages of unusual, almost totally free voice-leading with which this piece is peppered would probably still need to fall back upon its basis in instrumental exploration in order to make sense of it.

IN POLYPHONIAM ENARMONICAM—A MOTET BY GALEAZZO  
SABBATINI

The same can be supposed of the composition “Derelinquat impius viam suam” by Galeazzo Sabbatini (1597–1662), who had commissioned a vieltöniges harpsichord with thirty-six or thirty-eight notes per octave (Barbieri 1986).<sup>23</sup> Taking as his starting point a conventionally composed motet with a subtle text,<sup>24</sup> Sabbatini reworked the piece to produce a vieltönige version, which was published by Athanasius Kircher in his *Musurgia universalis* (1650, 664–72) as an example of *polyphonia enarmonico*.<sup>25</sup> Sabbatini makes use of nineteen pitches in total, each of the seven diatonic notes appearing with accidentals of  $\sharp$  and  $\flat$  (with the exception of  $G\flat$  and  $F\flat$ ), and he uses them in a very particular way: not only for “vertical” harmonies and distant modulations but also melodically, as part of the contrapuntal fabric.

Thus we find a rising chromatic passage (figure 11) whose upper voice rises from  $E_1$  to  $G\sharp_1$  (bar 65 beat 1), followed by a cadential step from  $G\sharp$  to  $A\flat$ , which is also indicated in the figures of the basso continuo. This quasi-microtonal progression, which is repeated in other voices between  $B$  and  $C\flat$  (tenor, bar 67) and between  $D\sharp$  and  $E\flat$  (alto, bar 69), also serves as evidence that this composition can only be successful if vieltönige scales are observed; a modern reading of these notes as “enharmonically equivalent” would be absurd in the context of this cadential phrase. In the equivalent passages in cantus and alto (bars 65 and 69), the motion of a rising second followed by a falling fifth in the continuo could be regarded as sufficient for a cadential effect, and thus an interpretation of the melodic line as merely an “enharmonic” respelling could perhaps be accepted; in bar 67, however, an insistence upon the same pitch in the tenor over the  $E$  in the continuo would be simply nonsensical in musical terms. This composition, described in Kircher's text as a “prototype,” is certainly striking for the consistency with which it explores the possibilities of Vieltönigkeit; but it is by no means unique.

22 The recording of the vieltöniges viol consort The Earle His Viols on the CD *La Tavola Cromatica* provides a good depiction of these new sounds (Tubb and The Earle His Viols 2004).

23 For a more detailed discussion, see also Kirnbauer (2013, chap. 5).

24 “Derelinquat impius viam suam et vir iniquus cogitationes suas / et revertetur ad Dominum et miserabitur eius”—“Let the wicked forsake his way, and the unrighteous man his thoughts / and let him return unto the LORD, and he will have mercy upon him” (Isaiah 55:7).

25 See the section marked “Triphonium Diatonico chromatico-enharmonicum”; for a more detailed discussion of the music and its context see Kirnbauer (2013, chap. 5).

“Viertönigkeit” instead of Microtonality

Notenbsp. V/1

64

C [sed ut ma-gis con-ver-ta-tur, con-ver-ta-tur et vi - vat]

A

T [sed ut ma-gis con-ver-ta-tur, con-ver-

B.C. b # # b b # b #

67

[sed ut ma-gis con-ver-ta-tur, con-ver-ta-tur et vi - vat]

ta-tur et vi - vat]

b # # b

G. Sabbatini, "Derelinquat impius viam suam" (Kircher, *Mvsurgia vniuersalis* 1650), I 668-9 (T. 63-T. 70)

Fig. 11

MELODIE METABOLICHE—GIOVANNI BATTISTA DONI AND  
VIELTÖNIGE MUSIC

The genera, introduced primarily by Nicola Vicentino, were not the only element of ancient music that produced vieltönige results. The principles of the ancient *tonoi* were researched above all by Giovanni Battista Doni (1595–1647) and adapted by him for the musical practice of the period.<sup>26</sup> Put briefly and in very simple terms, these are based upon octave spans taken from a double octave, each beginning on a different note—in a manner comparable to the church modes, which for a long time were regarded as their descendents, and which carried the same names. Doni realised that each of these scales, with its characteristic (and unequally tempered) sequence of tones and semitones, could be transposed to begin on any other pitch (figure 12). Doni thus makes a distinction between *tuono* and *modo*: *modo* refers to a particular scale with its characteristic sequence of intervals, *tuono* to its placement in a specific position and the real pitches that result. Each *modo* can be transposed to another *tuono* (i.e., another note), resulting in a variety of different scales and different

26 For more detail, see Palisca (1981, 1997); Kirnbauer (2013, chap. 2).

itches, since in temperaments such as mean-tone the size of tones and semi-tones is of course different for each scale. The ability to transpose these scales into the different genera is another, secondary possibility.

(a) Tuono, e Modo Dorio      (b) Tuono, e Modo Frigio

(c) Tuono Dorio, Modo Frigio      (d) Modo Dorio, Tuono Frigio

(e) Tuono, e Modo Hypolidio

(a) Frigio      (b) Dorio co' segni accidentali

Dorio diatonico      Dorio cromatico

Dorio enarmonico

Fig 12

To put his ideas into practice, Doni developed a series of musical instruments:<sup>27</sup> keyboard instruments with multiple keyboards (one for each *tuono*), harps with multiple rows of strings, and stringed instruments—especially viols—with separate groups of strings and additional frets for certain pitches. Central is the ability to follow the transpositions of an unequally tuned scale or tonality into distant harmonic areas and the expansion of pitch space that results.

Among the extant compositions following Doni’s system is a four-part work for voice with instrumental accompaniment by Pedro Eredia.<sup>28</sup> It sets a text

27 As well as the aforementioned chapter 2 of Kirnbauer (2013), see also the chapter “Doni’s Polyharmonic Instruments and the New Music Inspired by Greek Theory, c.1590–1650” in Barbieri (2008, 221–76).

28 A recording of this work by Eredia (also known as Heredia) can be found on *La Tavola Cromatica* (Tubb and The Earle His Viols 2004, T18); see also Kirnbauer (2002, 241–43).

by Maffeo Barberini, Pope Urban VIII, which deals with the fleeting nature of life and the importance of being prepared for the constant possibility of death (“Passa la vita all’abbassar d’un ciglio”—“Life passes in the blink of an eye”). Eredia only uses two *tuoni* for his setting (Dorian and Phrygian), allocating each to specific passages of the text. This creates a wide-ranging harmonic spectrum (stretching, in modern terms, as far as F# major and minor or C# major), but with adjacent modal areas juxtaposed relatively abruptly. These distinctions might seem subtle at first, but in the context of mean-tone tuning the tonal differences are considerable and need to be heard anew today.

Shifting explicitly between *tuoni* was only one way of building on the legendary *effetti meravigliosi* of ancient music, however. Doni also saw the potential for blending *tuoni* together, permitting smooth, multi-layered transitions between them. Remarkably, he was also able to integrate pre-existing, apparently conventionally-composed music into his concept—above all a number of madrigals by Carlo Gesualdo with a multitude of # and ♭ markings, which he described as “‘metabolic’ melodies, or with a mix of sharps and b flats” (Doni 1640, 302, my translation; *melodie Metaboliche, ò variate di diesi #, & b. molli*).<sup>29</sup> Gesualdo’s music ought in any case to be included in any consideration of different pitch systems, and it also raises the possibility of a clear contemporary solution to the question, heavily debated in the past, of whether Gesualdo’s “hyperchromatic,” harmonically wide-ranging music was intended for equal-tempered or multi-tonal tuning. It has now been largely accepted that Gesualdo’s own practice was also based around *Viertönigkeit*; but it has only recently emerged from an inventory of the Castello di Gesualdo that he himself possessed (and doubtless made use of) a *cimbalo cromatico*.<sup>30</sup>

Alongside keyboard instruments with split sharps, Doni (1763, 1:389, my translation) also specifically describes “normal viols but in a more perfect manner” (*Viole comuni più perfette*), which are standard viols with added frets, “because these [viols] also normally have a little fret which creates the same effect, without which it is impossible to play the madrigals of Gesualdo well, or similar ‘metabolic’ melodies” (*anch’ esso sogliono avere un tastino, che fa l’istesso effetto, ed altrimenti malamente vi si possono suonare i Madrigali del Principe, e simili cantilene Metaboliche*). In one of his writings, Doni actually reproduces a madrigal by Gesualdo, “*Tu m’uccidi crudele*,” arranged for an appropriately prepared viol consort.<sup>31</sup>

Gesualdo’s *Viertönigkeit* is not only notational but also conceptual, and carries implications for performance practice. Here, an apparently conventionally composed repertoire turns up in a *viertönigen* context, with at least some performance situations taking its *viertönige* scales into account. Today this idea carries explosive implications for performance practice, but even in Gesualdo’s time it had consequences, as composers in Giovanni Battista Doni’s time were

<sup>29</sup> For more detail, see Kirnbauer (2013, chap. 4).

<sup>30</sup> “a grand chromatic harpsichord with extended octaves” (Columbro 2008, 182, my translation; *un cimballo grande con le ottave stese cromatiche*).

<sup>31</sup> A recording can be found on *La Tavola Cromatica* (Tubb and The Earle His Viols 2004, T7).

writing “musiche metaboliche.”<sup>32</sup> The polyphonic madrigal repertoire cultivated by the Roman composers of the seventeenth century is especially relevant in this context. Not only are there examples such as the aforementioned Domenico Mazzocchi’s *Madrigali a cinque voci*, published in 1638, which features familiar vieltönige elements such as the adapted *messa di voce* and additional, vieltönige pitches; the interest in polyphonic madrigals actually led to a new kind of repertoire, which could be described as “table madrigals” (*madrigali al tavolino*). This terminology, first used in about 1650, can be derived from the visual impression produced by a group of singers gathered around a table, singing madrigals from partbooks. As an image, it is the opposite of a performance *al modo d’Orfeo*: a solo singer without a score, accompanied only by a basso continuo. Explicit Vieltönigkeit can be found in this repertoire too, even exceptional double-sharps in madrigals by Michelangelo Rossi. Of course, this music can also be played without taking the evidence of its Vieltönigkeit into account, but this overlooks one of the dimensions that it sets up: the effect of a vieltönige performance lies arguably in the excitement of hearing harmonies that have literally never been heard before, far removed from conventional sounds.

*SE JOÛE LENTEMENT AVEC DISCRETION*—UNDISCOVERED  
VIELTÖNIGE MUSIC BY JOHANN JACOB FROBERGER AND  
OTHERS

The idea, hitherto often overlooked, that a vieltönige performance practice was at least a possibility for this music applies equally to the last examples presented here. These come from a time when it was already becoming ever more normal to use more or less all available pitches (and, before long, all keys), with performance of the resulting music apparently made possible by the temperaments that had been developed by this point. But a closer look at the notation shows that even at this time Vieltönigkeit was (still) clearly extant and practised.

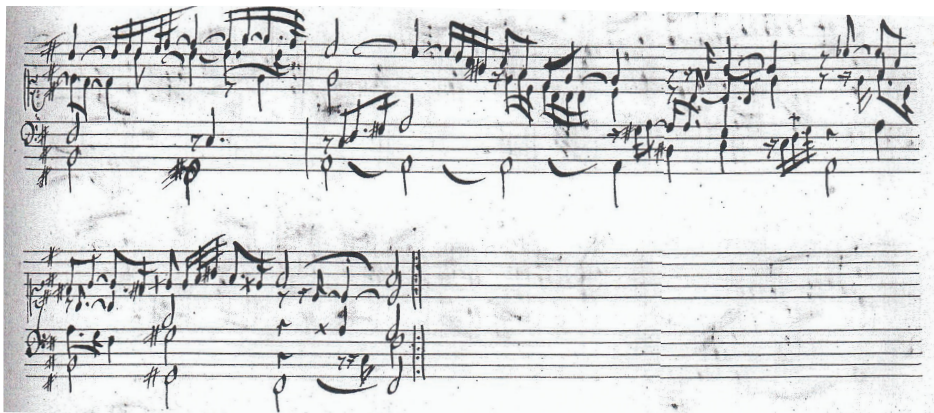


Fig. 13

<sup>32</sup> For more detail, see Kirnbauer (2013, chap. 4).

This is evident in the manuscripts of Johann Jacob Froberger (1616–67), where alongside the standard accidentals (# and ♭) he also uses the sign “x” with the notes E, A, and B; these are not to be confused with the modern understanding of E#, A#, or B# (figure 13).<sup>33</sup> Froberger is clearly making a distinction here between different pitches within mean-tone temperament—something that would in turn be required for performance by a viertöniges keyboard instrument. (Just as an aside, it should be noted that all modern editions—and thus far all recordings—of Froberger’s music ignore this striking and yet meaningful notational convention). Although this piece can certainly also be played on a completely normal harpsichord, with the usual twelve keys per octave, consideration of Froberger’s life suggests a different conclusion. He evidently stayed in Rome several times, having first been sent there in 1637 by the Viennese court to take lessons with Girolamo Frescobaldi; while there he would probably also have become aware of Doni’s viertönige ideas and the music of Mazzocchi and other Roman composers that resulted from them. With this in mind, it seems more likely here that Froberger was writing for a cimbalo cromatico, with a completely different sonic result.

In the case of Froberger, a connection with Roman Viertönigkeit is possible, and even seems likely. However, there are other examples that are musically very similar (that is to say, viertönig) but whose background has yet to be investigated in such detail. A violin sonata by Georg Muffat (1653–1704) can stand as a closing example of this; in some ways it is similar to the piece by Sabbatini discussed earlier (Muffat 1677, corresponding passage on fol. 3r+v; see figure 14).<sup>34</sup> In total, seventeen pitches are used within the composition, as a result of its far-reaching modulations. A spectacular effect—comparable with Sabbatini’s motet—is produced by the direct juxtaposition of E# and F (b. 118), A# and B♭ (b. 123–24), and B# and C (b. 129–30). In the light of this passage, these pitches demand to be taken seriously as part of a viertönige performance practice—not only in the violin part but also in the accompaniment of the basso continuo (see Barbieri 2008, 144).<sup>35</sup>

This brief outline of theory and practice in music that is not “microtonal,” but rather “viertönig,” demonstrates that the Viertönigkeit that I have located in the sixteenth and seventeenth centuries was not only a real phenomenon but also, above all, a musically relevant one—relevant in terms of both compositional structure and performance practice, even for music that appears conventional at first glance. Thus it is clear, too, that Viertönigkeit was and is no mere theoretical playground but rather (as it were) a musical one.

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33 For an example of this, see Froberger (1660, 63). This practice, which is not merely a quirk of notation, can also be found in Froberger’s autograph manuscripts (Peter Wollny, pers. comm.).

34 One notational quirk should be noted here, the use of a flat sign to cancel sharps and a sharp sign to cancel flats (shown above each relevant note in the transcription).

35 In addition to the sonatas by Marco Uccellini and Alessandro Stradella listed by Barbieri, other similar compositions by Giovanni Antonio Leoni and Giovanni Battista Vitali could be named.

Sonata Violino Solo (Ausschnitt)

G. Muffat

Violino

Bass

110

5 6 6 5 #4 6 b5

112

# #4 6 b5 # #4 6 b5

116

# # 7 6 7 6 5 b3 5 7 6 #4 6

120

6 # 7 # 6 7 6 7 6 7 6 #4 5 #

124

b b7 6 #4 6 6 # # 7 6

128

5 7 #6 7 4 4 # b 5 b7 6 #4 #4 b

132

7 #6 #4 6 6 # 7 6 #4 6 5

Allegro

Fig. 14

Figure 14. Georg Muffat, "Sonata Violino solo" (excerpt) (Muffat 1677).

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