Experimental Affinities in Music

Paulo de Assis (ed.)
Table of Contents

7   Introduction  
Paulo de Assis

15  Chapter One  
Explosive Experiments and the Fragility of the Experimental  
Lydia Goehr

42  Chapter Two  
*Omnis ars ex experimentis dependeat*: “Experiments” in  
Fourteenth-Century Musical Thought  
Felix Diergarten

64  Chapter Three  
“Viertönigkeit” instead of Microtonality: The Theory and Practice  
of Sixteenth- and Seventeenth-Century “Microtonal” Music  
Martin Kirnbauer

91  Chapter Four  
*Inscriptions*: An Interview with Helmut Lachenmann

105 Chapter Five  
Nuance and Innovation in Part I of the “48”  
Mark Lindley

128 Chapter Six  
Tales from Babel: Musical Adventures in the Science of Hearing  
Edward Wickham

147 Chapter Seven  
From Clockwork to Pulsation: Music and Artificial Life in the  
Eighteenth Century  
Lawrence Kramer

168 Chapter Eight  
*The Inner Ear*: An Interview with Leon Fleisher

177 Chapter Nine  
Execution—Interpretation—Performance:  
The History of a Terminological Conflict  
Hermann Danuser
Introduction

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In the years 2011, 2012, and 2013, the International Orpheus Academy for Music and Theory was constituted under a single rubric: “Artistic Experimentation in Music.” This overarching title aimed at disclosing and discussing artistic practices that questioned, challenged, or moved away from dominant or orthodox musical practices. Beyond looking at historically situated examples of “experimental music” (as in the “American Experimental Tradition”), or at experimental practices based on data collection, measurement, and observation (as abundantly done in recent decades in the areas of performance studies and performance science), the aim of this three-year programme was to bring together diverse historical, methodological, and artistic approaches that contribute to a new discourse on experimentation as an “attitude” and not simply as a quantifiable phenomenon. By an experimental “attitude” we mean a willingness to constantly reshift thoughts and practices, to operate new redistributions of the sensible, affording unpredictable reconfigurations of music, art, and society.

As the German philosopher Ludger Schwarte (2012, 187, my translation) formulated it, “Aesthetic experimentation starts when the parameters of a given aesthetic praxis are broken, suspended or transcended, in order to work out a particular mode of appearance that reconfigures the field of the visible and of the utterable.”

In music, the movement from interpretation to experimentation seems to be particularly arduous. The whole philosophical and psychoanalytical move away from interpretation into more creative and experimental modes—observable already in the 1960s and 1970s in works by Michel Foucault (1970, 1972), Jean-François Lyotard ([1971] 2002), Félix Guattari (1972, 1979), and Gilles Deleuze and Guattari (1977, and others), but also, even if from a different horizon of thought, in works by Paul Ricoeur (1970, 1974)—remains largely marginal to most musicians and musicologists. On the other hand, the more recent epistemological debate on experimentation (Ian Hacking 1982) and “experimental systems” (Hans-Jörg Rheinberger 1997), with its fundamental move away from theory-driven practices and with its practice-led approach, is basically unknown to the music community. The breaking, suspending, or transcending of musical practices finds its first obstacle in two all-too-often fetishised qualities: instrumental virtuosity and compositional handcraft. Professional musicians are spontaneously willing to experiment as long as it helps them to achieve “solid” results—that is, to confirm and reiterate the world as it is.

Experimentation is usually understood as referring to something still in a phase...
Chapter Three

“Vieltönigkeit” 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, “Vieltönige 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 “cimbalom cromatico”—that is, a harpsichord with twenty-four keys to the octave—accompanied by the soprano Gunhild Lang-Alsvik and the violinist Eva Saladin.1

“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

DOI http://dx.doi.org/10.11116/9789461661883.ch03
1 These important live recordings can be heard online at http://www.orpheusinstituut.be/en/experimental-affinities-in-music-repository
“Vieltönigkeit” instead of Microtonality

compounded version of the semitone “panchromaticism” that he criticises; 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 κικρός, “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.3 Although the black and white keyboard 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.4

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 C♭, D♭, E♭ . . . ), 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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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, has 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). 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). 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: “Clavemusicum Omnitonum / Modulis 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).

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.
“Vieltönigkeit” instead of Microtonality

With the keywords *omnitonum* 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 “Vieltönigkeit.” 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 Vieltönigkeit 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 VIELTONIGE 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, 46) 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. 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♯ (as a major third above E) is different in pitch from an A♭ (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).
Fig. 2. Table of cent measurements.

<table>
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<tr>
<th></th>
<th>Mean-tone</th>
<th>Equal</th>
<th>Just</th>
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</thead>
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<td>0</td>
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<td>76</td>
<td>100</td>
<td>71</td>
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<td>D♭</td>
<td>117</td>
<td>100</td>
<td>112</td>
</tr>
<tr>
<td>D</td>
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<td>200</td>
<td>204</td>
</tr>
<tr>
<td>D#</td>
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<td>300</td>
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</tr>
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<td>462</td>
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<tr>
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</table>

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. 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.

8 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); Orgles (2003); Barbieri (2008).
“Vieltönigkeit” instead of Microtonality

Evidence is found comparatively frequently for keyboards with fourteen keys—the two additional keys usually being assigned to G♯/A♭ and D♯/E♭—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♯ or F♭) and B–C (for B♯ or C♭). The name of the “cimbalo cromatico” already implies the second aspect of Vieltönigkeit mentioned earlier—its tendency to refer back to the music of antiquity.

![Image of a keyboard instrument](image)

**L’ANTICA MUSICA RIDOTTA ALLA MODERNA PRATTICA**—
NICOLA VICENTINO AND VIETTÓNIGKEIT

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

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9 For a proposed systematic terminology, see Rasch (2002, 21–33); for other similar instruments, see Wight (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 διατόνιος, 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 χρωματική, “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 εμφανίστις γένος, set in the “harmonia”) fills in a major third (for example, E–Ex–F–A). 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. 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.” 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.

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**Figure 4. The three genera: diatonic, chromatic, and enharmonic.**

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10 In this article, “x” is used to denote the enharmonic dieis; this should not be confused with the modern usage of the symbol “♯” for a double sharp.
11 See the excellent English translation and introduction by Maria Rika Maniates (Vicentino 1996), as well as Cordes (2007).
12 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’invenzione di uno nuovo strumento, nel quale si contiene tutta la perfetta musica, con molti segreti musicali.
One example of his style is the four-part madrigal “Musica priscat caput,” 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 prisicis 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 dulcisus, 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; fra li 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).

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 specie 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.
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, vieltönige 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 vieltönig 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.

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). These instruments took the reservoir of vieltönige 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...
“Vieltönigkeit” instead of Microtonality

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![Image](image.jpg)

Fig. 6. "Mano della divisione del tono in quattro Diesis Enarmonici," in L’antica musica ridotta alla moderna prattica (Vicentino 1555, fol. 12v).

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).¹⁴ These instruments took the reservoir of vieltönige 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

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¹⁴ 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 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.\textsuperscript{15} Prime examples of this are the “Madrigali cromatici” (explicitly named to him, and treading this newly expanded tonal space in at least a rudimentary way).\textsuperscript{15} 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

\begin{itemize}
\end{itemize}
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 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). 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 emulatone 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 nell’inter gen[er]a” [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]). 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

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16 One well-known example of this is found in the chanson “Je suis tellement amoureux” by Antoine de Bertrand (1578, fol. 8).
18 *Intenso* and *moll* 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 (*moll*, “soft”).
Figure 8. Musical examples by Ascanio Mayone in Fabio Colonna, La Sambuca Lincea (Colonna 1618): (a) Stabat mater—“Compositione confusa nelli tre generi” (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).
“Vieltönigkeit” instead of Microtonality
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). 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).

*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), 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).

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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, & exercitio maggior profitto, & trovar delle altre consonanze belle, che non vi ne mancassero per l’istromento perfetto, con il quale può andar vagando in ogni sorta di geno de musica simplice, & misto; ma fin hora il servire dell’ altri geni per arrichire 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).
Martin Kirnbauer 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). 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 circolatione 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).

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

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

“Vieltönigkeit” instead of Microtonality

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

Another piece that makes use of the visible and tangible possibilities of a vieltöniges 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 can- tus 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♭ and D♯, A♭ and G♯, C♯ and D♭, F and E♯), 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

Figure 10. Gioanpietro del Buono, “Sonata VII. Stravagante, e per il cimbalo cromatico,” in Canoni, Oblighi et Sonate in varie maniere sopra l’Ave Maria Stella (del Buono 1641, fol. [M1v–M2v]).

* C Final note written a third too high

Fig. 10
example of .25 Sabbatini makes use of nineteen pitches in published by Athanasius Kircher in his (1650, 664–72) as an

ges harpsichord with thirty-six or thirty-eight notes per octave (Barbieri 1986).23

The same can be supposed of the composition “Derelinquant impius viam suam” by Galeazzo Sabbatini (1597–1662), who had commissioned a vieltönige viol consort The Earle His Viols on the CD Tubb and The Earle His Viols 2004).24 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 enarmonica.26 Sabbatini makes use of nineteen pitches in total, each of the seven diatonic notes appearing with accidentals of # and ♯ (with the exception of G♭ and F♯), 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♮ to G♯1 (bar 65 beat 1), followed by a cadential step from G♯ to A♭, 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♭ (tenor, bar 67) and between D♯ and E♭ (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 vieltönige viol consort The Earle His Viols on the CD Le Tirolo Cromatico 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 reveretur ad Dominum et miserectur eius”—“Let the wicked forsake his way, and the unrighteous man his thoughts / and let him return unto the Lorp, and he will have mercy upon him” (Isaiah 55:7).
25 See the section marked “Triphonia Diatonicum chromatico-enharmonicum”; for a more detailed discussion of the music and its context see Kirnbauer (2013, chap. 5).
“Vieltönigkeit” instead of Microtonality

MELODIE METABOLICHE—GIOVANNI BATTISTA DONI AND VIETÖNIGE 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.26 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

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

83
Martin Kirnbauer

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

![Diagram of scales after Giovanni Battista Doni.](image)

To put his ideas into practice, Doni developed a series of musical instruments: 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. It sets a text

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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, T7); see also Kirnbauer (2002, 241–43).
“Vieltönigkeit” instead of Microtonality

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).29 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 multisonal tuning. It has now been largely accepted that Gesualdo’s own practice was also based around Vieltönigkeit; 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.30

Alongside keyboard instruments with split sharps, Doni (1763, 1:380, 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.31

Gesualdo’s Vieltönigkeit is not only notational but also conceptual, and carries implications for performance practice. Here, an apparently conventionally composed repertoire turns up in a vieltönigen context, with at least some performance situations taking its vieltönige 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

29 For more detail, see Kirnbauer (2013, chap. 4).
30 “a grand chromatic harpsichord with extended octaves” (Columbro 2008, 182, my translation; un zimbalo grande con le ottave stese cromatiche).
31 A recording can be found on La Tavola Cromaticas (Tubb and The Earle His Viols 2004, T7).

85
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 demands to be taken seriously as part of a vieltönige performance practice—not more likely here that Froberger was writing for a cimbalo cromatico, with a completely normal harpsichord, with the usual twelve keys per octave, considered a 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 demands to be taken seriously as part of a vieltönige performance practice—not more likely here that Froberger was writing for a cimbalo cromatico, with a completely normal harpsichord, with the usual twelve keys per octave, considered a

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

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32 For more detail, see Kirnbauer (2013, chap. 4).
“Vieltönigkeit” instead of Microtonality

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).33 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 vieltöniges 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 vieltönige 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 Vieltönigkeit is possible, and even seems likely. However, there are other examples that are musically very similar (that is to say, vieltönig) 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).34 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 vieltönige performance practice—not only in the violin part but also in the accompaniment of the basso continuo (see Barbieri 2008, 144).35

This brief outline of theory and practice in music that is not “microtonal,” but rather “vieltönig,” demonstrates that the Vieltönigkeit 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 Vieltönigkeit was and is no mere theoretical playground but rather (as it were) a musical one.

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

Allegro

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

Figure 14. Georg Muffat, “Sonata Violino solo” (excerpt) (Muffat 1677).
“Vieltönigkeit” instead of Microtonality

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Martin Kirnbauer


