# "Bach's extraordinary temperament: our Rosetta Stone"

## Case Study supplement for part 2

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**Case study: *O Mensch, bewein dein Sünde groß*, BWV 622**

The tuning of a keyboard has implications for accentuation, articulation, phrasing, and timing.[1] A good example is the concluding phrase "*wohl an dem Kreuze lange*" in Bach's chorale prelude "*O Mensch, bewein dein Sünde groß*" (organ solo), in *Orgelbüchlein*. The second syllable of the word "*Kreuze*" is weaker than the first, and correspondingly in the musical setting it is at the weakest position at the end of a bar. Furthermore, Bach has subdivided that syllable with chromatic motion, including pass-through of an extraordinary Cb major triad. These last two bars of the piece begin with exactly the same notes, in identical spacing, but their melodic/harmonic contexts make them sound utterly different.

To facilitate comparison, Figure 1 shows the intonation of this passage in regular 1/6 PC, Kellner's 1975 temperament, and Bach's. The numerals indicate the sizes of the melodic tones and semitones, in cents.

Harmonic analysis:

- In 1/6 PC there are *five*(!) wolf major thirds in this brief passage, making it sound extremely discordant and unsettling. These are above the bass notes Gb, Ab, C, and Cb. The music sounds suddenly sour. One could rationalize it away by claiming that Bach is depicting the pain of crucifixion; but why would he put the worst of them at the very end of a weak syllable, in weakest metric position? Furthermore, wolf fifths Ab-Eb come up twice in the final bar, plus a wolf fourth (its inversion), when the music "should" be relaxing into its final cadence.
- Kellner's temperament has tamed all the wolf thirds to Pythagorean or near-Pythagorean thirds, but the effect is still rough in those same five places. The passage is similarly jarring, and merely watered-down in intensity. The Cb moment sounds accented, no matter how the player may try to de-emphasize it. What if it was not intended to be jarring *at all*?
- Bach's temperament has no such problems of jarring discontinuity. The downbeats over Ab have a remarkably smooth major third in them. The Cb major triad is appropriately consonant, befitting a weak syllable in passing, not calling undue attention to itself in intonation.[2] The strong moment here is revealed to be the Fb slightly *after* the downbeat: very briefly forming the temperament's brightest E major triad enharmonically. This suggests that all the melodic notes Ab-G-Gb-F should be slurred together as the word "*Kreu-ze-e-e*" across the barline, and then the (freshly articulated) Fb is the beginning of the new word "*lange*", receiving the accent.

Melodic analysis:

- In 1/6 PC the chromatic semitones of 86 cents and diatonic semitones of 110 are so different from one another, the passage sounds randomly bumpy in both the bass and treble. The Ab is much too flat to be the peak of the phrase,[3] and gives the effect of poorly supported singing. (And, this problem is exacerbated in regular 1/5 and 1/4 comma!) Furthermore, the large semitone of G moving to Gb (within "-ze" of "*Kreuze*") draws attention to itself, accenting the surprise and making the moment seem strong rather than weak.
- In Kellner's temperament some of that is smoothed out, but the Ab at 95 cents is still too low as a climactic melody note.[4] The 109-cent semitones in the bass are obtrusively large, next to others of 95.
- In Bach's temperament the variety of semitones is subtle everywhere (keeping the mind moving, without drawing conscious attention), with the exception of F to Fb in the final bar. The 110-cent semitone there corroborates the observation above that there should probably be an articulative break between these two notes. This is the largest semitone available in the temperament, and calls attention to itself, helping the local musical climax at that final word of the piece.

(a) Regular 1/6 PC

adagissimo

196 196 86 86 110 86 110 196 110

196 86 86

110 86 110 110 86 110 196 110

(b) Kellner

adagissimo

204 199 95 95 109 90 109 196 109

204 90 90

109 95 100 104 95 109 195 100

(c) Bach

adagissimo

204 196 100 100 102 94 110 196 102

202 98 98

102 100 96 104 96 106 196 102

**Figure 1: Intonation of concluding phrase "*wohl an dem Kreuze lange*" in BWV 622, "*O Mensch, bewein dein Sünde groß*". The tones and semitones are given in cent measurements.**

In equal temperament, none of this comes up; all harmonies sound alike, all tones (200 cents) and semitones (100 cents) have equal inexpressivity, and there is no dramatic tension due to intonation. A player in equal temperament must work much harder to bring out any features of harmony or melody, artificially, to make a comparable degree of effect.

Why not simply tune the instrument Bach's way and then play it by reacting sensitively to the sounds of the intervals? The music has already been composed, brilliantly. Bach allegedly explained his own art as an organist, thus: "There is nothing remarkable about it. All one has to do is hit the right notes at the right time, and the instrument plays itself."[5] If the instrument is set up in the correct temperament, and if the player is sensitive to its nuances (i.e. knowing the "right time" to play the notes, to bring out the specific motivic, melodic, and harmonic effects), the instrument indeed "plays itself" and the musical interpretation is relatively easy.

**Case study: *Kleines harmonisches Labyrinth*, BWV 591**

Wright (2000)[6] in *Bach-Jahrbuch* and Bartels (2003) for the *Neue Bach-Ausgabe*[7] have admitted this little musical labyrinth to the canon. Ledbetter (2002)[8] and Williams (2003)[9] both continue to vote it out. *BWV*[2a] (1998)[10] assigns it to appendix 2, the questioned works.

Whoever wrote it, for whichever instrument(s) (organ, pedal harpsichord, harpsichord, or clavichord), it works fine as a keyboard solo and it calls for optional pedal only in a pedal-point near the end. When played in Bach's temperament there is a climactic moment which I believe is telling: immediately after the beginning of the "*Exitus*" the composer juxtaposes C major and E major, the calmest and strongest keys available. The effect is sudden and jarring, rather like seeing the exit of a maze directly ahead but then needing to turn one more series of unexpectedly twisting paths on the way out. That moment is also at the "golden mean" of the piece.

Wright (2001)[11] built some of his commentary on the presumed duality of C-F#, remarking that "F# major was the most dissonant and distant key" in all Baroque unequal temperaments. In support of this he refers the reader back to *New Grove*.[12] The piece as a whole, however, is much smoother and less problematic in Bach's temperament, along with that dramatic "*Exitus*" moment. The other rough spots familiar from play-throughs in other temperaments (Vallotti, Werckmeister, Kirnberger, Neidhardt, *et al*) simply do not exist.

Bach's temperament seems to be a perfect match for this piece, musically, giving the journey a consistent and simple internal logic.[13] The enharmonic shifts, the strong contrasts of sharp and flat keys, and the twelve-tone chromatic fugue subject build an adventure that has gentle but balanced surprises at every turn, like being in a maze; in other temperaments the dramatic motion sounds more haphazard. This labyrinth may be one of many pieces where theological interpretations of musical points would need to be re-thought. Attention is due to see what a composer may have done with *quality* of intervals as a directly expressive device, keeping the listener engaged and guessing at every moment where the piece will go next.

**Case study: *Clavierübung III***

This book of abstruse music has perplexed scholars and musicians, ever since its genesis.[14] The title page exceptionally mentions connoisseurs, along with the music-lovers mentioned on the title pages of the other three books of *Clavierübung*. Who are these mysterious connoisseurs? Are they perhaps those who understand tuning, deeply?

When the instrument is not tuned appropriately (i.e. with anything other than Bach's harmonic shape, or in equal temperament which evades all issues), *Clavierübung III* is a series of musical disasters. The majestic Eb prelude BWV 552 crashes and burns in the Ab major sections. The large "Kyrie, Gott Heiliger Geist" BWV 671 collapses even more violently ("Lord have mercy!"), especially in its last seven bars. "Jesus Christus, unser Heiland" BWV 689 has complex suspensions and crunches from passing motion, in the deep flats; "Aus tiefer Not" BWV 687 is its counterpart in the remote sharps. "Christe, aller Welt Trost" BWV 673 has complex harmonies from linear independence, even though it sticks to the classic set of meantone notes (plus D#). The large "Vater unser" BWV 682 has a chromatic countersubject that sounds bumpy if the differences between chromatic and diatonic semitones are too great. There are also numerous exposed occurrences of F#-A# and B-D#, in wide spacings; and Bb, Eb, Ab, G#, D#, and A# share airspace on the last page. The three "Allein Gott" settings, in F, G, and A, evidently depict God in three quite different moods or aspects.

This is wondrous music, when tuned Bach's way, and a cringe-fest otherwise (or merely for the long-suffering, in equal temperament). Perhaps this book was designed, at least in part, to show once and for all that the Werckmeister and meantone tuning shapes belong in the dust-bin, where tonal music is concerned. Connoisseur Sorge[15] was perceptive enough, by 1758, to discard all unequal temperaments (his own, Neidhardt's, and his 1744 prototype of "Kirnberger III") save one. Those two are equal temperament (i.e. the null shape), and Sorge's own version of Bach's shape.[16]

The four *Duetti* distill the tuning issues to the essence: melodic integrity and the interaction of two parts, forming harmonic intervals. Perhaps that is a large part of their purpose. If the four *Duetti* don't work in a 15-minute play-through, the organ being tested is not suitable to play the rest of the book either. All four Duetti have close juxtapositions of subjects transposed quickly, a startling effect. They have blatant occurrences of parallel major thirds and/or parallel minor sixths, a sound heard rarely in Bach:[17] bitonal contrapuntal voices. The A minor *Duetto* explores cross-relations approached by similar motion. The F major *Duetto* starts with the worst *melodic* triad available in Werckmeister III: F-A-C (with the A much too low).[18] Yearsley's analysis[19] brings out other "eat-my-dust-Johann-Scheibe!" characteristics of this piece. The E minor *Duetto* has multiple occurrences of disguised parallel fifths, and enharmonic equivalences written on successive beats.[20] The G major *Duetto* is perhaps a control case, a foil: how does "normal" mostly-consonant music come across, alongside these "power user" tests?

Yearsley's strong chapters about the Scheibe attack, and about alchemy,[21] suggest a further set of questions for exploration, in light of Bach's tuning. Musical alchemy, if any, happens in counterpoint *plus tuning*, an inseparable combination. Melodic intervals become arranged additionally into harmonic (and inharmonic) intervals. The interaction of two or more parts causes additional tendencies toward stasis or tension, needing resolution in time. In a carefully balanced unequal temperament such as Bach's own, the field of tensions and resolutions is extremely complex (and invisible on the page). Yet, the resulting music is so simple to the ear that the contrapuntal process seems almost like magic; the whole universe is in order. I believe that any analytical study of counterpoint must include a reaction to the *sound* of the unequal intervals. The instruments must be tuned Bach's way to hear what he heard, so we may figure out why he used the notes he did; speculation must meet practice! Without the *sound* of the intervals, are the notes on paper not merely the base metals awaiting the philosopher's stone? How can the analysis itself transcend the piece of paper?

**Further observations about the Four *Duetti***
BWV 802-805, published 1739 in Bach's *Clavierübung III* (Bach's first publication of organ music)

- *Clavierübung III* is a book of chorale preludes—presenting the required music for the Lutheran liturgy—plus a grand prelude and fugue in E-flat major. The four *Duetti* are also part of this collection, placed immediately before the closing fugue.
- These are written in invertible counterpoint, i.e. they can work well musically whether played normally or with the hands crossed, or with organ registrations that cross the parts! The same melodies work in combination, whichever one happens to be the bass. Therefore, the musical ideas can be passed freely from one part to the other.
- Their purpose has puzzled historians and commentators. I believe their primary purpose (in addition to being beautiful music on their own!) is to test the tuning of organs, as candidate instruments to play all the other music in the book. These little *Duetti* present the fundamental problems of keyboard tuning, distilled to the most brutally exposed texture of melodies moving in two-part invertible harmony. There are various features in these *Duetti* that are apparently designed to make all the inappropriate tunings fail miserably. The only tunings that really work are Bach's own (as preferred), or equal temperament (which blandly avoids offense, but also washes the expressive color out of the compositions).
- How many normally forbidden compositional techniques can Bach "get away with" in these pieces, *because he can*, in his first publication of organ music? How much art can he hide in four simple-looking compositions, in a texture that looks trivial? How systematic and comprehensive can music be, short of looking too artful on the surface?[22]

***Duetto* 1, E minor**

- Bach presents enharmonic pairs of notes (such as A#=Bb, C#=Db, etc) as closely together as possible, within the same bars! Therefore, since the keyboard has only one lever for each, those notes must be tuned in some manner that they work well either way, with convincingly smooth melodic placement. Meantone tunings fail here.
- Bach disguises parallel 5ths—usually a forbidden sound from music!—at close amounts of time. I have marked these with "5" in the score. All these 5ths must be reasonably tuned, to sound clean enough as 5ths: no wolves! These 5ths are disguised melodically with a minimum amount of written-out ornamentation; we shouldn't notice that they are there.
- When those same passages of parallel 5ths are inverted, at all the places I have marked "3", they illustrate the other primary problem in tuning: the handling of major 3rds (and 10ths). Bach presents a permutation of all twelve of the major 3rds in this way, except for Ab-C. He gets that remaining example into the piece at least twice, in the places I have circled where there is a leap to a G# while holding a C in the other voice.
- This composition presents long strings of bizarre sounds: parallel major 10ths and minor 6ths. All these must be tuned decently as major 3rds and inverted major 3rds; no hidden diminished 4ths (as meantone tunings give us). When there is some variety among the major 3rds, as in Bach's own tuning, these passages are brilliant and exciting. If there is no variety, as in equal temperament, these passages are only mildly interesting: merely sounding somewhat like running a finger up and down the keyboard on a tierce registration.

***Duetto* 2, F major**

- The first section has the almost unbelievable property that there are *no dissonances* anywhere.[23] The second section makes up for that, having the most ostentatious combinations in close counterpoint.
- All the passages I have marked with an arch are explorations of the melodic sound of an augmented 2nd. Normally, that sound is rare in music…but Bach has used it as a main theme.
- In the passage marked with a wiggly bracket, Bach has not only exchanged his voices, he has also flipped all the music upside-down. The melodies both move in the opposite direction, compared with the way we had just heard them. Major triads become minor triads, and the music becomes thick with flats. This is a huge contrast: the "clean" sound of F major, vs the troubled run of those flats. In any unequal temperament that is too extreme, or improperly balanced, this inverted passage is a train wreck. The scales and leaps in the flat keys are too bumpy (melodically), and/or rough spots are created in the harmony of the two voices.

- The first section gives the rising-triad subject with a real answer (a change of some of the intervals), which is so ordinary as to be uninteresting. But the second section gives the rising-triad theme in minor, and answered as closely as possible by major triads! Furthermore, this creates motion in parallel major 10ths between the voices. Any problems in a temperament's handling of major 3rds become blatant here. Most unequal temperaments fail especially when the intervals Ab-C and Db-F occur together between the two voices. At a keyboard, play and listen closely to this section played in Vallotti and in the Neidhardt temperaments that have wide Ab-C and Db-F (Ab-C being the widest major third in the set {C-E, E-G#, Ab-C}; and Db-F likewise in the set {F-A, A-C#, Db-F}). Then play them again in Bach's, in which Ab-C is smaller than E-G#, and Db-F has the same size as A-C#.
- These same dichotomies of D minor vs A major, A minor vs E major, F minor vs C major, and C minor vs G major illustrate the extremes of contrast within Bach's own temperament. D minor and A minor are the plainest minor triads, but they have the brightest possible dominants. And F minor and C minor have the most troubled triads, against the calmest dominants.
- The simple subject of an F-A-C rising triad sounds bad in Werckmeister's best-known temperament. The A and the C are respectively too low and too high, *melodically*, in that context. Such a simple subject, on such common notes; and such a bad effect in a wrong tuning! (The Kellner temperament, derived from Werckmeister's, has a similar problem for the same reason, but is a little more moderate.)

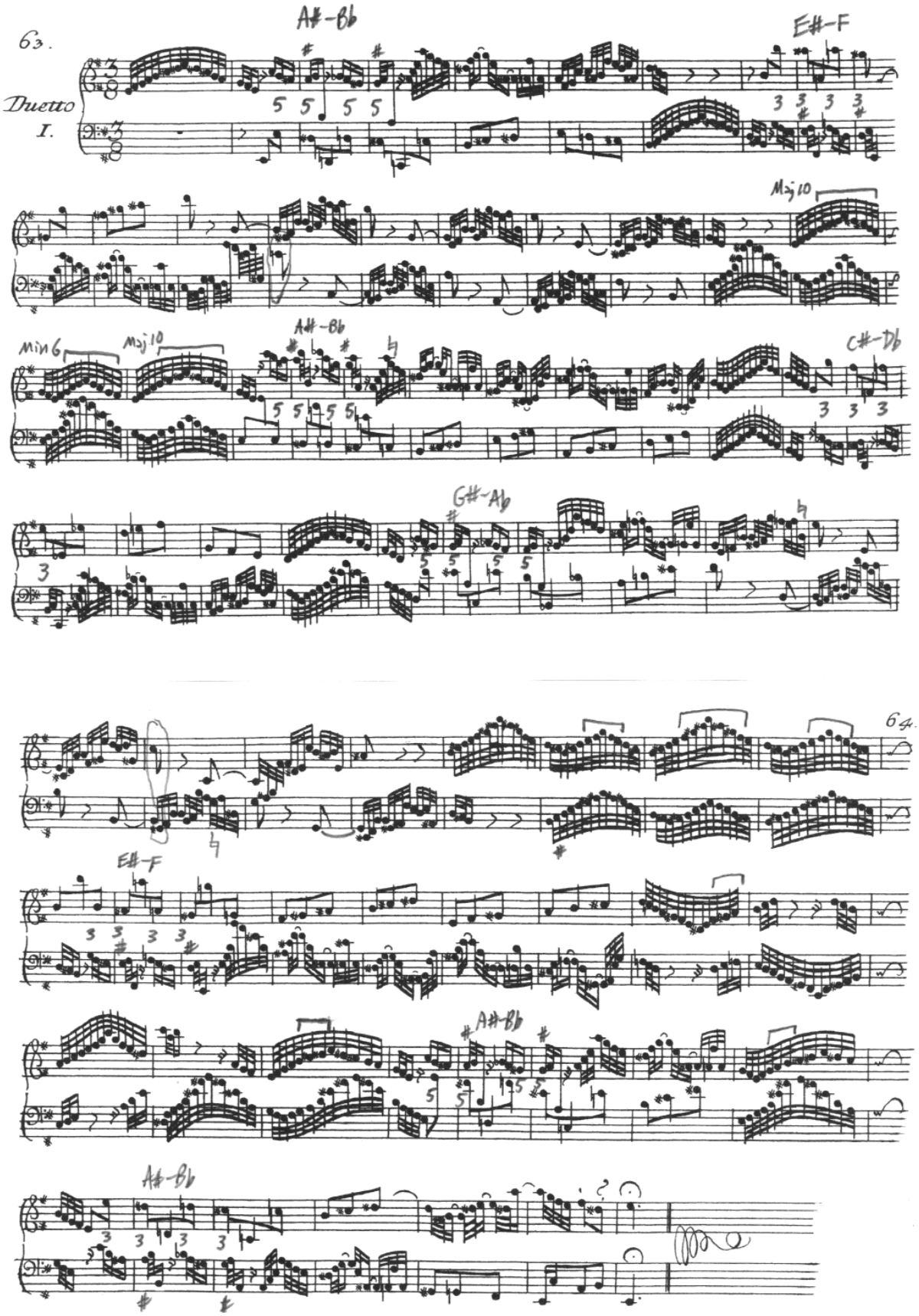
***Duetto* 3, G major**

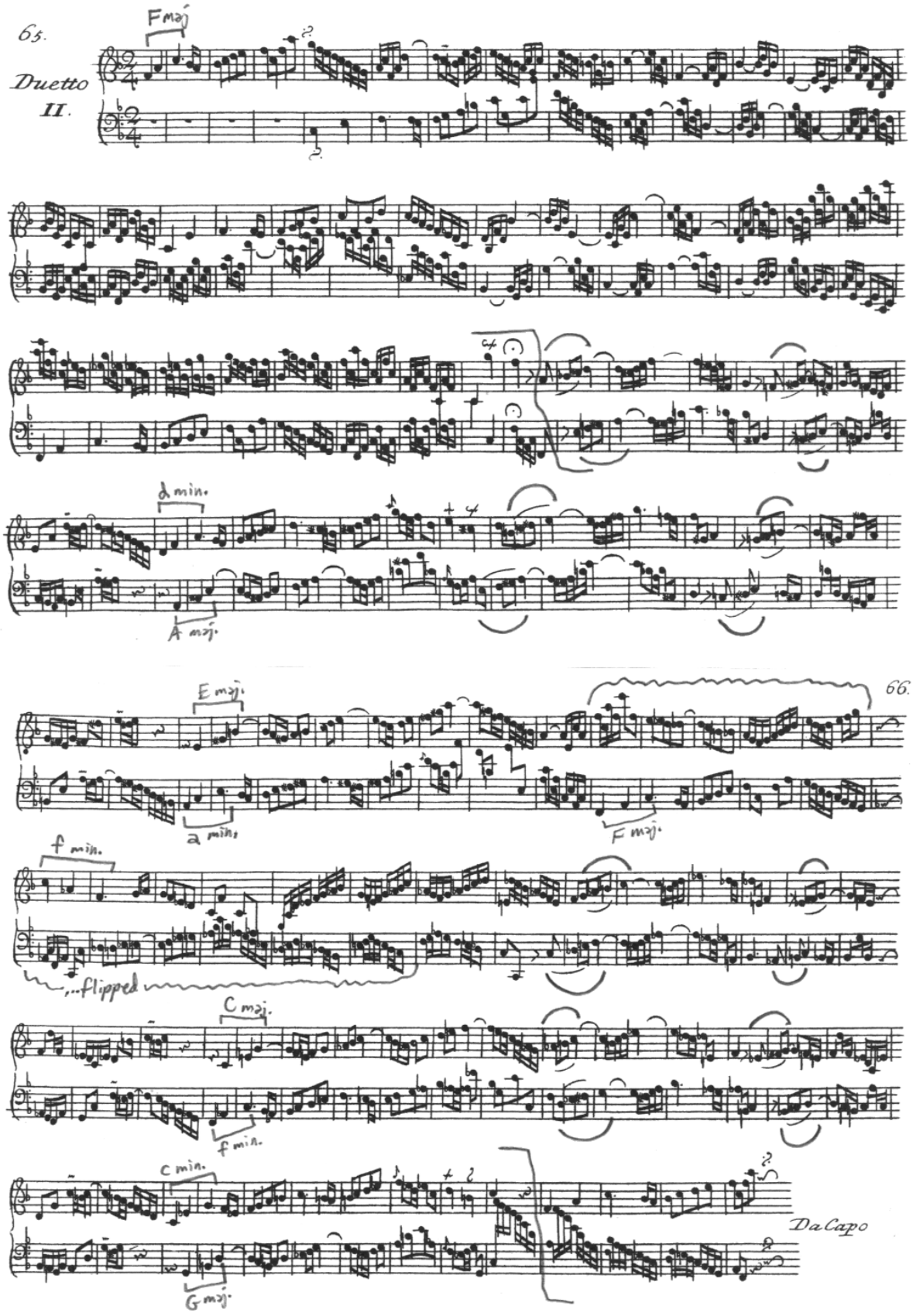
- This piece is so innocuous (on the expectations set up by the other three *Duetti*) that there has to be a hidden catch somewhere. It is such ordinary-sounding music in G major. In that plainness it is a good piece to test bizarre registrations, such as using a tierce registration *in the bass* and a nazard in the treble.... That particular registration works out surprisingly well for a piece of this length, having only the momentary clash I have marked with * (and the same interval six bars later and an octave higher). At these points the treble D# has some disagreement with the pure D# of the tierce on the low B.

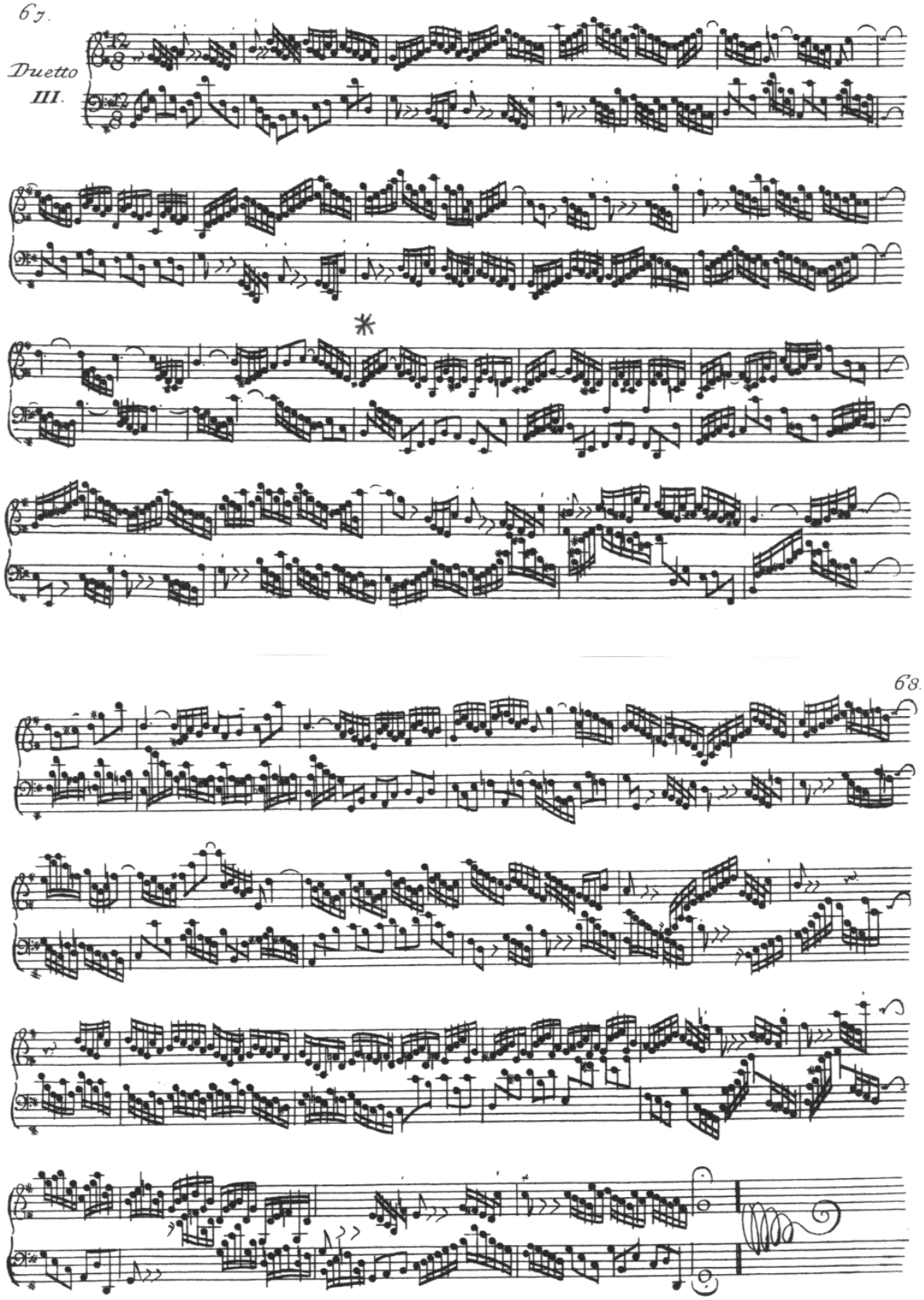
***Duetto* 4, A minor**

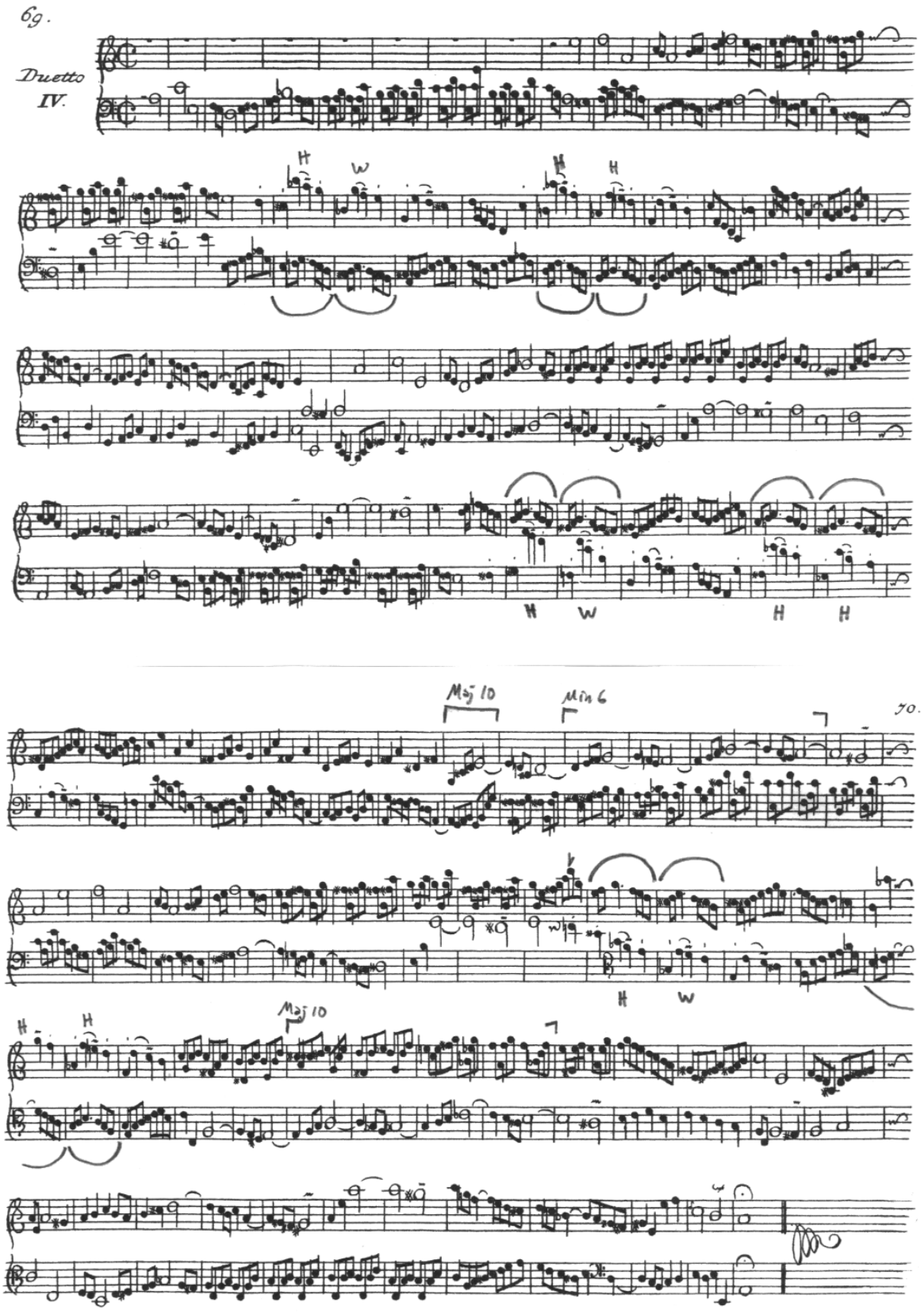
- Our parallel major 10ths and minor 6ths are back again, as in the first two Duetti. They sound especially odd and startling here because they cause the music to cut across the "circle of 5ths" too quickly, harmonically.
- In the passages I have marked with arches, Bach reused the same music next to itself but in different keys. (And, there are occasional slight differences in the other voice, where a half step changes to a whole step; I have marked these with H and W.) In tunings where all the keys sound different from one another, these color contrasts must be well-balanced so they do not sound too obtrusive in these quick shifts. These passages test the melodic handling of minor 3rds: both as harmony of the two voices together, and in the recycling of the music moved down by a minor 3rd each time.

**Figure 2 (overleaf): The four *Duetti*, BWV 802-805, printed in Leipzig 1739. Annotated for this Case Study.**


63.
Duetto I.
A#-Bb
E#-F
Maj10
Min6
Maj10
A#-Bb
C#-Db
G#-Ab
64.
E#-F
A#-Bb
A#-Bb


65.
Duetto II.
F maj.
d min.
A maj.
E maj.
a min.
F maj.
66.
f min.
...flipped
C maj.
f min.
c min.
G maj.
Da Capo


67.
Duetto
III.
68.


69.
Duetto
IV.
H
W
H
H
H
W
H
H
Maj 10
Min 6
70.
H
W
H
Maj 10

## Appendix: A quick and practical tuning method, by ear

As discussed in the article, the pattern to be delivered onto the keyboard is:

- **1/6 PC narrow 5ths F-C-G-D-A-E,**
- **pure 5ths E-B-F#-C#,**
- **1/12 PC narrow 5ths C#-G#-D#-A#,**
- **and the residual 1/12 PC *wide* diminished 6th A#-F.**

The following method, using a technique of several temporary notes, is a quick and accurate way to set up this pattern. It takes only a few minutes, with practice (having memorized this sequence through experience). The temporary notes are used to place some of the other notes precisely, without having to guess at beat rates in the 5ths. We need only know the *musical* technique of listening accurately to a rhythm of triplets against duplets. See **www.larips.com** for an more detailed explanation how and why it works.

- Take A from the tuning fork or other appropriate source.
- Set F: tenor F-A (below middle C) beats wide at 3 beats per second. First tune it pure with the tenor A, and then lower it until this major 3rd beats at the proper speed. It has 3.0 beats per second (or double the metronome speed of 89) if we are starting from A=440; or 2.8 beats (double the metronome 84) if starting from A=415. Such speeds can be memorized by thinking of the tempos of some appropriate compositions; or, use a watch with a digital readout or a ticking second-hand.
- From the tenor F tune down a 4th to C, temporarily pure. We will move this C later.
- From the tenor A tune down a 5th to D, temporarily pure.
- Set tenor G from that C and D so the 4th D-G beats 1.5 times as fast as the 5th C-G. (Triplets against duplets.) Our temporary C and D are only there to set this G precisely into place, halfway between the F and the A: a *mean tone* between them. The sounds of this 5th and 4th here are remarkably rough (technically it is 1/3 comma each), and it is therefore easy to hear these beats, because we have not tempered the C or D yet.
- Set middle C from the tenor F and that G, likewise: the 4th G-C beating as triplets against the duplets of the 5th F-C. These are now our 1/6 comma 5ths, placed accurately.
- Set middle D from tenor G and A likewise, with the 4th A-D beating as triplets against the duplets of the 5th G-D. **By this point we have achieved F-C-G-D-A as regular 1/6 comma 5ths.**
- Correct the lower D and C to match these two, as octaves. In this correction we have averaged the (temporarily) pure and 1/3 comma 5ths/4ths on either side of them to be two 1/6 comma 5ths/4ths.
- Set middle E from tenor A slightly flat, with the same quality as these other 5ths. It should beat as a major 3rd from middle C at 4.5 times per second. Also check it as a 10th from tenor C, the same 4.5 times per second. An excellent test for this particular F-A and C-E is found at bar 21 of the C major prelude of *WTC* book 1. These two major 3rds should have exactly the same character as one another, although the beat rate is different (since the pitch is different).
- Copy middle E down to tenor E. Check that the E-A 4th sounds properly with 1/6 comma quality.
- Set pure 5ths E-B-F#-C#. These are in their final positions. Test them also as pure 4ths.
- From the F above middle C, tune pure fifths downward F-Bb-Eb. This is a step to set the Eb exactly; we will move this temporary Bb soon.
- Copy that tenor Eb up to middle Eb, and test this as a pure 4th from the Bb.
- Tune tenor G# pure to tenor C# and then slightly lower it so the C#-G# 5th and the Ab-Eb 5th (flanking middle C) have the same quality as one another: a very slow beat from each. It is so slight that it is scarcely noticeable from either one. These are our 1/12 comma 5ths.
- Lower A# slightly so it has a slow beat from D# like that of C#-G# and Ab-Eb. This also introduces a slow beat into the Bb-F 5th, but it is wide rather than narrow. We have now placed A# into its proper position, which coincidentally softens the F#-A# major 3rd slightly.
- We now have the complete bearing. Confirm the entire pattern to be sure no errors have been introduced anywhere: **1/6 PC narrow 5ths F-C-G-D-A-E, pure 5ths E-B-F#-C#, 1/12 PC narrow 5ths C#-G#-D#-A#, and the residual 1/12 PC *wide* diminished 6th A#-F.** The 1/12 comma 5ths are so subtle as to be scarcely perceptible.
- Finish the instrument with pure octaves and unisons: all the bass, then all the treble. It is useful especially in the treble to check all the octaves' purity by testing the 5ths and 4ths within them. This ensures that we still have the proper pattern of 1/6, 1/12, or pure 5ths and 4ths at each position.

[1] A demonstration recording is available for most of the music presented in these Case Studies. The performances are by Bradley Lehman on the Taylor & Boody organ "Opus 41" at Goshen College, Goshen Indiana (USA), March 2005. Details of that organ and recording are at *www.larips.com* .

[2] Furthermore, this passage shows itself to be kin to the endings of both the Eb prelude and fugue in WTC 1: with the slithering motion of flat triads.

[3] It is tuned as a G#, not an Ab; hence the discrepancy of function.

[4] This is a rare case where the Kellner temperament handles melody *less* well than its parent, Werckmeister III, which has a 96-cent semitone from G to Ab.

[5] *New Bach Reader*, #404; *Bach-Dokumente III*, #820. Reported by Johann Friedrich Köhler, Leipzig, after 1776.

[6] Craig Wright, "Bachs 'Kleines harmonisches Labyrinth' (BWV 591): Echtheitsfragen und theologischer Hintergrund", *Bach-Jahrbuch* 2000, pp51-64.

[7] *NBA*, IV/11, 2003.

[8] Ledbetter, *WTC*, p110.

[9] Williams, *The Organ Music of Bach*, 2nd ed., pp199-200.

[10] Dürr, Kobayashi, Beißwenger eds., *Bach-Werke-Verzeichnis, Kleine Ausgabe* (BWV$^{2a}$), 1998.

[11] Craig Wright, *The Maze and the Warrior*, 2001, pp254-64.

[12] Chapter 9, footnote #46, sending the reader to Lindley's "Temperaments" article.

[13] As described in the "recipe" section of part 1 of the article, the temperament in its relative qualities of major thirds is based not on an axis of C-F# duality, but on the triangle of C-E-G#/Ab.

[14] A good background of this is provided by Peter Williams, in *The Organ Music of J. S. Bach*, second edition (2003).

[15] See the section "Origins and Destination", in part 1 of the article. See also "The Neumeister Collection" in Wolff, *Bach: Essays on his life and music*, 1991, pp107-127. Sorge (via *Balthasar Schmids Erben* in Nürnberg, #30, 1750) published a book of his own chorale preludes in response to *Clavierübung III*. There he remarked that Bach's book deserves its great renown for its musical qualities, but that his (Sorge's) friends and pupils clamored for music that is easier to play!

[16] See part 1.

[17] See also the D minor fugue and A major prelude of *WTC* 2, and the Fantasia BWV 918.

[18] See part 2.

[19] Yearsley, *Bach and the Meanings of Counterpoint*, chapter 3.

[20] These incidents caused C. L. van Panthaleon van Eck to conclude in *J. S. Bach's Critique of Pure Music* (1981) that *Clavierübung III* was an equal-temperament manifesto. However, a premise of van Eck's entire book is his hypothesis that Bach was ever interested in *exact* transpositions (down to the tuning of intervals) within contrapuntal music; and the author's circular reasoning (and unfamiliarity with meantone truisms) brings out his own premise as his conclusion….

[21] Yearsley, chapters 3 and 2.

[22] Williams, *The Life of Bach*, 2004, p53: "[Bach's] thoroughness [at times] comes close to the pedantic. A mature work such as the Four Duets in *Clavierübung III* systematically includes, but without overstepping the confines of the chosen genre, the various categories of pulse, metre, time signature, mode, key, form, imitation, counterpoint, motif, chromatic, diatonic, etc., as if they were preplanned and ticked off on a list. It is as if an upbringing far from obvious musical centres left him both exceptionally curious and exceptionally determined to master all possibilities, and the penchant to be comprehensive was gradually becoming stronger."

[23] See also Yearsley's chapter 3 for more detail about this observation.