

already have considerably more embellishment than their originals, as a starting point from which to add still more. With works by composers like Bach, we might want to recall Scheibe's words to the virtuosos; the most praiseworthy quality, he says, is being "content with what the composer has written."

BACH'S OCCASIONAL CANON BWV 1073 AND "STACKED" CANONIC PROCEDURE IN THE EIGHTEENTH CENTURY

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Bach's life-long interest in canonic composition is manifest not only in the large-scale works devoted to exploring various contrapuntal techniques, but also in a number of short occasional works of a generally theoretical nature written throughout his life and usually placed in albums dedicated to students or friends. Canons of this kind were often noted in enigmatic fashion and their solution provided intellectual enjoyment to the dedicatees. Christoph Wolff suggests that Bach derived much pleasure from writing pieces in this genre and in solving similar puzzle canons by others.¹ Wolff also suggests that Bach's occasional canons could "challenge his visitors with simple-looking yet complex vignettes of musical logic."² Some eight occasional canons survive, and it is very likely that many more are lost. Bach's earliest surviving occasional canon is dated 2 August 1713, in Weimar, and it appears

¹Christoph Wolff, "Bach, Johann Sebastian," *The New Grove Dictionary of Music Online* ed. L. Macy (Accessed 24 October 2002), <<http://www.grovemusic.com>>. The entry on "Canons, 'Musical Offering,' 'Art of Fugue'" is unchanged since *The New Grove Bach Family*, Christoph Wolff et. al. (London and New York: W. W. Norton & Company, 1983), 160–63.

²Christoph Wolff, *Johann Sebastian Bach: The Learned Musician* (Oxford University Press, 2000), 421.

as an album entry to an unknown dedicatee.³ The solution to this canon appears as Example 1.

If we accept Wolff's idea that such pieces may contain an interesting intellectual challenge or accomplishment, then what may we find in *BWV 1073* with its apparently straightforward four-part canonic imitation without any recourse to erudite devices such as inversion, retrograde motion or the like? For an answer we may turn initially to recent scholarship on Renaissance canonic literature, in particular to an essay by Alan Gosman where a canonic subtype, termed the "stacked" canon, is identified.⁴ Pieces written in this way are usually for three or four parts with equal temporal distances separating the voice entries. Most important, though, is that the same interval of imitation occurs between the successively entering voices. In most works this interval is the fourth (above or below) or the fifth (above or below). (Bach's *BWV 1073* is an example of a stacked canon for four parts at the fifth above.) Gosman identifies five examples of the stacked canon in sixteenth-century literature, and he asserts the importance of the genre by noting that many music printers from the period, including Petrucci, featured them as opening or closing works in their collections. Furthermore, he claims that the stacked canon is a compositional tour de force, and he notes that composers normally only produced one example in this genre.⁵ His detailed and intricate analyses of the stacked canons by Ockeghem, Mouton, Verdelot, and Willaert support his hypothesis. Gosman also refers to the disorienting quality of the stacked canon because of the presentation of the same melodic material on different

Example 1. J. S. Bach, Four-part Canon *BWV 1073*

³See Hans T. David and Arthur Mendel, *The New Bach Reader*, revised and enlarged by Christoph Wolff (New York and London: W.W. Norton, 1998), 65–66, for a translation of the dedication and a facsimile reproduction of the canon, which was originally notated in one part only. Solutions and facsimiles of this and the other occasional canons are found in *NBA VIII/1*. The solution to *BWV 1073* may be also found in *Arts Canonica*, vol. 6 (*Corona Werke für Kammerorchester 106*, ed. Adolf Hoffmann), 28, and in Fritz Jöde, ed., *Der Kanon: Ein Singbuch für alle* (Wolfenbüttel: Mörsler, 1959), 76, where the text "pleni sunt coeli" is added.

⁴Alan Gosman, "Stacked Canon and Renaissance Compositional Procedure," *Journal of Music Theory* 41, no. 2 (1997): 289–317.

⁵Gosman, 290.

pitch levels. The stacked canon, therefore, presents challenges in maintaining tonal control over the material—challenges that are arguably not present to such an extent in other canonic subtypes. In other words, a composer will not have as much difficulty maintaining a sense of key (or mode) in a canon, say, at the unison for three or four parts as he or she would have when composing a stacked canon in three or four parts.

I have identified further examples of the stacked canon by composers active between c. 1500 and c. 1800, as well as some examples appearing in music treatises.⁶ Most of these examples employ canonic imitation at the fourth or fifth (above or below) while only a very small number use other intervals of imitation. The examples found in theoretical treatises are not accompanied by discussions of what is involved in writing this type of canon. Other canonic subtypes employing three or more voices commonly found in the literature from this period include canons at the octave or unison, and canons in which at least two of the voices are at the same pitch level. Typical of the latter type are four-part canons with voices paired at the octave.⁷

It has often been argued that many of Bach's works form part, if not the culmination, of a long tradition of contrapuntal writing;⁸

⁶For example, see one stacked canon each by J. Gallus and Michael Praetorius, and a further five by Palestrina (including one of dubious authorship) in addition to the example mentioned by Gosman. Examples may be found in treatises by Pietro Pontio, *Dialogo della musica* (Parma, 1595), Pietro Cerone, *El melopeo y maestro* (Naples, 1613), and Christopher Simpson, *A Compendium of Musick* (London, 1678). Other eighteenth-century examples identified so far include two by Kirnberger and one by the obscure I. S. Smith (found in the Fritz Jöde collection cited in note 3 above). Two stacked canons by Rameau have been identified by Alan Gosman in a more recent article, "Rameau and Zarlino: Polemics in the *Traité de l'harmonie*," *Music Theory Spectrum* 22, no. 1 (spring 2000):44–59. It is quite possible that more examples exist in the literature.

⁷For example, a voice entry pattern such as C–G–C–G, reading from bottom to top in SATB format. Examples of these and other canonic subtypes may be found in the *Art Canonica* series.

⁸For example see Philipp Spitta, *Johann Sebastian Bach*, 2 vols., trans. Clara Bell and J. A. Fuller-Maitland (New York: Dover Publications Inc, 1951); Hans T. David, *J. S. Bach's Musical Offering* (New York: Dover, 1945); Christoph Wolff, "Buxtehude, Bach and Seventeenth-Century Music in Retrospect" in *Bach: Essays on His Life and Music*

therefore, one could argue that BWV 1073 belongs to the tradition of canonic writing in which the stacked canonic subtype was considered particularly challenging. While it should be remembered that there is no documentary evidence indicating that Bach or any other composer considered the stacked canon as a distinct and established genre, we may reasonably consider it as one of the various canonic artifices with which musicians could test their compositional skill. Furthermore, study of BWV 1073 may yield some important insights into how Bach approached canonic counterpoint while still a relatively young man. Other examples of this canonic subtype from the eighteenth century might also provide insights into how composers dealt with various compositional problems associated with the stacked canon, especially as regards tonality. It is also possible that other eighteenth-century composers were conscious of Bach's contribution when they approached the stacked canon subtype.

Bach's BWV 1073 introduces voice entries at the interval of the fifth above. A canon of this type must (still) observe certain rules of voice leading, the most general of which is that in canonic writing an overall consonant relationship should be maintained among the parts. Occasional dissonances such as passing notes or suspensions may be employed, but it is essential that consonant intervals occur on metrically strong positions, most especially on those positions that are multiples of the canon's temporal interval. This means that the choice of notes available to the first canonic voice, the *guida*, is restricted to those that will lead to permissible harmonic intervals with the second and subsequent imitating voices, the *consequenti*.⁹ In other words, if one were to prepare first species reductions of stacked canons written in the sixteenth, seventeenth, and eighteenth centuries based on their temporal distances one would almost always find a consonant

(Cambridge, Mass. and London: Harvard University Press, 1991), 41–55; Denis Collins, "Historical Precedents for Bach's *Ewigkeit* Canon, BWV 1087–10" (*BACH*, 24, no.1 (1993): 5–14; Denis Collins, "Spiegel-Kontrapunkt in Theorie und Praxis: Vorläufer für Contrapunctus 12 und 13 aus Bachs Kunst der Fuge," *Bach-Jahrbuch* 82 (1996): 77–92.

⁹Zarlino's terms *guida* and *consequente* will be used for the opening voice and the imitating voice, respectively.

framework rigorously adhered to. Exceptions to this would relate to a composer's specific intentions in a composition.¹⁰

In canonic writing the harmonic intervals formed between *guida* and *consequente* (or between any pair of voices in a multi-voice canon) depend on the melodic motion of the *guida*. Certain melodic progressions will lead to consonant harmonic intervals with the *consequente*, while others will lead to dissonances. The temporal distance between the canonic voices and the interval of imitation determine which melodic intervals are available to the *guida* in order to maintain an overall consonant framework. Because the possible permutations of temporal distance, interval of imitation, and numbers of voices in canonic writing is enormous, it is not surprising that theorists of the Renaissance and Baroque periods rarely provide detailed prescriptions of canonic writing. Such an exhaustive undertaking has not been undertaken in modern times either. A recent study of the principles of canonic writing by Robert Gauldin concentrated on providing a set of general algorithms to assist students with canons in two and three parts at the fourth, fifth, and octave. These algorithms are of a general nature and do not prepare one fully for the complexities involved in stacked canons.¹¹ Another recent study by Robert Morris concentrates on specifying the melodic intervals permissible in the *guida* in two-part canons at all intervals from unison to octave above or below.¹² Because stacked canons usually have three or four parts (rarely are they written for more parts), Morris's prescriptions for two-part canonic writing have limited application. Even if we consider a three- or four-part canon as comprising a number of embedded two-part canons, Morris's tables will still be of limited assistance because the composer needs to take into account the overall resulting consonant framework amongst all of the voice relationships in a stacked canon.

¹⁰For example, Gosman, p. 296, found that in *Prenez sur moi*, Ockeghem introduced a dissonance where it was particularly appropriate at that point of the text.

¹¹Robert Gauldin, "The Composition of Late Renaissance Stretto Canons," *Theory and Practice* 21 (1997): 29–54.

¹²Robert D. Morris, "The Structure of First-Species Canon in Modal, Tonal and Atonal Musics," *Intégral* 9 (1995): 33–66.

Although theorists rarely provided detailed rules for canonic composition, there are some notable exceptions, principally in the writings of Zarlino and his successors such as Nanino and Berardi. While these rules are not concerned with stacked canon procedure, we may take note of chapter 63 in book three of the revised 1573 edition of *Le Istitutioni Harmoniche*.¹³ Zarlino specifies the melodic intervals available to the *guida* in order to maintain consonant harmonic intervals against the other voices in two-part cantus firmus-based canons at various temporal distances and intervals of imitation. Zarlino's lists are in the form of enumerations of permitted melodic intervals in the *guida* depending on the melodic motion of the given cantus firmus.¹⁴ This approach is also useful when considering other types of canonic writing, and in fact the tables of permitted *guida* melodic intervals derived by Gosman, Gauldin, and Morris are similar in formulation (albeit with more sophisticated presentation and illustrations).

If we turn to Bach's occasional canon BWV 1073 and consider the range of options available to Bach when composing a four-part stacked canon at the fifth above, we can construct a table specifying the melodic intervals in the *guida* that will lead to consonant or dissonant interval formations with the *consequente*. In Table 1, the up and down arrows refer to ascending and descending intervals, respectively, while the + sign indicates permitted intervals and the x sign indicates prohibited intervals. The * sign refers to theoretically permitted intervals that may be excluded on stylistic grounds (that is, an ascending seventh is rarely found, while octave leaps may lead to congestion, part crossing, or the interval of the fourth between the *guida* and *consequente* in this type of canon). Noteworthy also is how an interval is paired with its inversion: a descending fourth and ascending fifth are both allowable intervals, while the ascending fourth and descending fifth are prohibited intervals. This arises because these interval pairs lead to the same pitch name, e.g., C

¹³Venice: F. Senese (1573); facsimile rpt. New York: Broude Bros. (1965), 276–317.

¹⁴This material is examined in detail in Denis Collins and David Huron, "A Comparison between the Theory and Practice of Renaissance and Baroque Cantus Firmus-based Canons Using a Computer-Assisted Inferential Methodology," *Computers and Music Research* 6 (1999), in press.

descending to G (a descending fourth) or ascending to G (an ascending fifth).

If we examine Example 1, we will see that Bach only uses intervals from the "permitted" category between notes forming intervals at consecutive half-note distances, i.e., the time distance of the canon. He does not use any ascending sevenths or octaves, most likely on stylistic grounds. There is a prevalence of ascending thirds and descending fourths. In many cases we see consecutive ascending thirds followed by a descending fourth. A reduction of BWV 1073 to a first species framework in Example 2 shows how the canon is crafted around the permitted melodic motion of the *guida*. In Example 2 a fifth staff has been added underneath the lowest part (*guida*) to show the harmonic direction of the canon. The two half-notes in each measure indicate the root of the chord present in the canon at these points. What also becomes evident in Example 2 is that Bach employs a repeated harmonic pattern throughout the canon. The square brackets placed above groups of notes show that there are seven segments to the canon, which form a symmetrical framework to the piece. The first and last comprise the roots C-G-D-A,¹⁵ the second, third, fifth, and sixth comprise C-G-D-F, while the center of the work comprises the roots A-E-G-D-A. The first two of these segments are very similar, differing by just the last note.¹⁶ In Example 1 we can see that the central segment takes the music through wider ranges (the parts span only a sixth prior to measure 7) including the lowest and highest registers, found in measures 8 and 9, respectively. Like the first and last segments of the canon, the duration of the middle segment is five half-notes, whereas the duration of each of the other segments is four half-notes; thus there is a rhythmic symmetry to the canon also. However, segments 2 and 3 start on the second half of measures 3 and 5, respectively, whereas

¹⁵The note A in the seventh segment occurs upon observing the repeat marks, returning the music to measure 3. As the piece is a perpetual canon, there can of course be as many repetitions of the music as wanted by the dedicatee or modern-day performers. My analysis is based on the amount of material provided by Bach that we have in facsimile.

¹⁶In fact, at the beginning of m. 3 the harmony is ambiguous since only the notes C and A are present. In Example 1, the note E does not appear in the elaboration for the first half-note of this measure.

Interval	Allowed/ Prohibited	Number of Occurrences
↑Unison	+	2
↑2nd	X	0
↓2nd	+	4
↑3rd	+	10
↓3rd	X	0
↑4th	X	0
↓4th	+	6
↑5th	+	3
↓5th	X	0
↑6th	X	0
↓6th	+	2
↑7th	*	0
↓7th	X	0
↑8ve	X	0
↓8ve	*	0

Table 1
Canon at the fifth above: melodic intervals in the *guida* part formed by the temporal distance of the canon. The + sign indicates permitted intervals; the X sign indicates prohibited intervals, and the * sign refers to intervals that are theoretically possible but which may be excluded on stylistic grounds.

segments 5 and 6 begin on the downbeats of measures 10 and 12, respectively. The change from beginning the segments on the first to the second half-note is a subtle one: in Example 1, measure 3, there is a relatively long duration for the note C in the bass part, but the upper parts suggest an A minor chord. The second half of measure 3 maintains the note C in the bass to begin the second segment. In a sense, Bach is taking advantage of the restrictions of stacked canon procedure here because the imitative voice entries spaced at the fifth above require an A minor harmony at this point, whereas the emphasis on C in the bass provides ambiguity about whether one structural segment is ending or another beginning.

Are we justified in deriving a first-species reduction of BWV 1073 and arguing for an underlying repeated harmonic pattern? Can we find similar approaches to canonic composition amongst other composers? The answer is a clear yes: Robert Gauldin argues persuasively that the "application of first-species reduction to the canonic literature frequently uncovers short- or long-range patterns that are subsequently sequenced"¹⁷ and demonstrates his argument with several examples. David Wulstan proposes that "many medieval canons, rondelli and other works can be seen to have been founded on ground basses of one sort or another."¹⁸ Finally, Bach himself later in life used the technique of an underlying harmonic pattern, for example, in the canons of the Goldberg Variations and the associated fourteen canons, BWV 1087.

At measures 11 to 13 of BWV 1073, Bach employs syncopated rhythms (see Example 1). These add to the interest of the piece without disturbing the underlying harmonic scheme. The tied note D in the lowest part at the beginning of measure 11 does not alter the harmonic scheme in any way, while the first quarter-note beat of measure 13 prolongs the G major harmony of the previous bar before the expected D minor chord is established on the second quarter-note of measure 13.¹⁹ This prolongation should not be seen

¹⁷Gauldin, 31.

¹⁸David Wulstan, "Sumer is icumen in—a Perpetual Puzzle Canon?" *Plain-song and Medieval Music* 9 (2000): 1–17.

¹⁹Therefore, in m. 13 of Example 2, the added staff contains the note D whereas the upper notes form a G major chord.

as introducing a new harmony (G major chord) at this point, but rather as a decoration of the underlying harmonic scheme.

Example 2: Voice Reduction of BWV 1073

The harmonic pattern is well suited to a stacked canon at the fifth above. We notice in Example 2 (canonic parts) that there is a preponderance of ascending thirds, often two consecutively, followed by descending fourths. The ascending fifth so prominent in the repeated harmonic pattern (bottom staff) is often filled in by means of consecutive ascending thirds. Bach has chosen these intervals carefully because in a stacked canon further complications arise when the third and fourth parts are present. A permissible interval in a two-part canonic framework may lead to difficulties with unwanted dissonances when more voices are present. For example, although the ascending third and unison are permitted in stacked canons at the fifth above (see Table 1), problems arise if an ascending third in the *guida* is followed by a unison. Likewise, a pair of descending seconds in the *guida* part lead to a 6/4 chord (see Examples 3a and 3b). Bach's

Example 3: Voice Leading Difficulties in Stacked Canonic Writing

3a

3b

solution to this area of potential difficulty is to use consecutive interval progressions in the *guida* that will ensure consonant outcomes with all three *consequentes*. It is possible to construct a table specifying

the melodic choices available to a composer of a four-part stacked canon at the fifth above. When second and third *consequentes* are present in a stacked canon, the composer needs to be aware of the implications of the melodic progressions in the *guida* at different multiples of the canon's temporal distance (as stated earlier, equal temporal distances separate voice entries in the stacked canon). Table 2 presents the permitted melodic progressions in the *guida* in a canon at the fifth above at twice the temporal distance of the canon (i.e., the distance between the *guida* and second *consequente* will be twice the distance between the *guida* and first *consequente*).²⁰ Table 3 presents the available melodic progressions in the *guida* at three times the temporal distance of the canon (i.e., the distance between the *guida* and third *consequente*). The restrictions and possibilities presented in Tables 1, 2, and 3 may appear daunting to the composer of canon; fortunately, observance of the permitted intervals between *guida* and the first *consequente* normally helps the composer to avoid problems with the remaining two *consequentes*.

Unlike the composers of Renaissance canons, Bach was concerned with issues of tonality in most of his contrapuntal output. BWV 1073 shows a tonal orientation most especially in the relationship by fifth between notes in the repeated harmonic pattern. Yet many of the progressions show an older *prima prattica* orientation of this piece; for instance, the frequent G major to D minor to F major (or V-II-IV) progressions, as evidenced in the opening bars. Also, the central section, based on what I have referred to as the fourth segment, may very well have been explored in a more modulatory manner by Bach later in life; as it is, the canon is diatonic throughout. Furthermore, the voice reduction in Example 2 reveals a few minor harmonic infelicities, for example, some parallel fifths or octaves between notes a half-note apart, which have been covered in the working out of the piece in Example 1.²¹ Nevertheless, this canon

²⁰*Guida* intervals in Table 2 are calculated by taking the notes that occur on metrically strong positions, i.e., beats 1 and 3 of each bar (the temporal distance of the canon) and then calculating the melodic interval formed with *guida* notes at twice the temporal distance (a whole note) away.

²¹Note parallel fifths between bass and soprano in m. 7, parallel octaves between bass and tenor across the barline from m. 10 to 11, and parallel octaves between alto and soprano going across the barline from m. 11 to 12.

Canon at the Fifth Above: permitted melodic intervals in the guida part on metrically strong positions at twice the temporal distance of the canon.

Table 2

Interval	Number of occurrences
↓2 nd	4
↓2 nd	11
↓4 th	1
↓4 th	1
↓5 th	4
↓5 th	1
↓6 th	0
↓7 th	2
↓7 th	2

Canon at the fifth above: permitted melodic intervals in the guida part on metrically strong positions at three times the temporal distance of the canon.

Table 3

Interval	Number of occurrences
unison	0
↓2 nd	7
↓3 rd	3
↓4 th	7
↓5 th	8
↓6 th	0
↓7 th	0
↓8 ^{ve}	0
↓8 ^{ve}	0

reveals a very careful construction that takes advantage of the possibilities and challenges of the stacked canonic technique, and certain features, in particular the use of a repetitive harmonic scheme, that were taken up by Bach in his mature canonic writing.

Stacked canonic writing does not seem to have been cultivated by Bach's contemporaries, many of whom avoided canonic artifice altogether. Those who did contribute to the canonic literature generally wrote canons at the unison or octave.²² While Bach's output during the last twenty years of his life included some of the greatest contributions to the history of canon—in works such as the *Musical Offering*, *Goldberg Variations*, *Art of Fugue*, and *Canonic Variations on "Vom Himmel hoch"*—his contemporaries moved away from counterpoint to the *galant* idiom of simplicity, homophony, and elegance in musical style. Nevertheless, canonic writing is found throughout eighteenth-century sources, most especially in theoretical treatises on music. The writings of well-known figures such as Mattheson, Marpurg, Kirnberger, and Martini all include some consideration of fugal and canonic techniques. One of these figures, Kirnberger, wrote two pieces that may be regarded as stacked canons. We do not know if Kirnberger thought of these pieces as belonging to a tradition of writing for this canonic subtype, yet they were studied extensively by other authors from the period: Marpurg, Kollmann, and Albrechtsberger included the two Kirnberger canons in their theoretical writings. Transcriptions of both canons may be found in Robert N. Freeman's modern edition of Albrechtsberger's manuscript canon collection.²³

Both of Kirnberger's canons are for four parts with temporal distances of two measures, and each modulates through the complete circle of fifths, with the first canon exploring the twelve major keys

²²See Denis Collins, "Bach and Approaches to Canonic Composition in Early Eighteenth-Century Theoretical and Chamber Music Sources," *BACH* 30, no.2 (1999): 27–48.

²³Robert N. Freeman, "Johann Georg Albrechtsberger's 26 canoni aperti dei vari autori: The Edition," *Theoria* 8 (1994): 1–52. In his commentary, Freeman notes that the two Kirnberger canons are also found in Marpurg's *Abhandlung von der Fuge* (Berlin, 1753–54), and in A. F. C. Kollmann, *An Essay on Practical Musical Composition* (London, 1799). Kirnberger also included them (in unresolved form) in his *Die Kunst des reinen Satzes in der Music* (Berlin and Königsberg, 1777), part 2, section 3, 60–62.

and the second going through the twelve minor keys. Because the canons are so similarly constructed and use similar melodic material, we will look in detail only at the second, more complex of them.²⁴ This canon is given in Example 4. The chromatic nature of the piece is evident in the use of different key signatures and in the frequent use of accidentals in the individual parts. The key signatures of the different parts at the beginning reflect the order of keys in the first 10 bars: A-E-B-F# minor. The opening motif itself is somewhat tonally ambiguous with the long-held E and confirmation of A minor only coming in measures 3-4. However, the most important motif is the descending quarter-note pattern first introduced in measure 5 and returning in two different guises later (marked with brackets in Example 4, bass part only). This canon, like its companion piece, divides into three sections, the first part moving through keys with small numbers of accidentals, while the second and third sections move through the sharp and flat sides, respectively. Furthermore, Kirnberger weakens the sense of tonicization by using interrupted cadential progressions (V-VI) at numerous points. For instance, in Example 4, the key of F# minor is weakened at measure 10 by the note D in the bass giving the chord of VI in F#. I have placed indications of key underneath the bass part to facilitate identification of the circle of fifths progression. One further point should also be noted: Freeman observes that Marpurg added the notes A and D at measures 25 and 26 even though they do not appear in any of Kirnberger's own publications including this canon. Marpurg may have simply wished to emphasize the presence of D minor at this stage in the progression of keys.

Kirnberger's canon is a unique achievement in the history of canonic writing. An accomplished musical scholar in his own right, he may have been aware of earlier examples of stacked canon technique, although it is not clear if he would have known Bach's

²⁴The canons are transcribed in Freeman, 26-31. The texture of the first canon is predominantly three-part due to frequent use of rests and it has a very clear three-part sectional division.

Example 4
J. P. Kirnberger, Stacked Canon Exploring Minor Keys Through
the Circle of Fifths

17

S.
A.
T.
B.

21

S.
A.
T.
B.

25

S.
A.
T.
B.

3

S.
A.
T.
B.

BWV 1073.²⁵ Given the complex chromatic harmonies of Kirnberger's canon, however, and bearing in mind that he was a former student and a champion of Bach, it is quite possible that Kirnberger may have had in mind Bach's other canons, possibly the *canon per tonos* from the *Musical Offering*, which is a two-part canon at the fifth above over an elaborated version of the Royal Theme. This canon also uses complex chromatic harmonies and was notated by Bach as a circle canon.²⁶ The canons from the *Musical Offering* were reproduced in the writings of Kirnberger, Marpurg, and other later eighteenth-century theorists, and it is thus quite likely that Kirnberger was stimulated by these pieces into exploring the more advanced harmonic possibilities of canonic writing. In any event, by the end of the eighteenth century the tradition of intellectual craftsmanship as exemplified by the various types of canonic artifice had become obsolete, to the extent that canonic imitation was still occasionally used by composers, it was often just a medium for the exchange of friendly greetings or musical jokes, as was often the case with Haydn, Mozart and Beethoven.

²⁵It is also possible that he may have known the two stacked canons by Rameau (see note 6 above).

²⁶This canon is analyzed by Denis Collins and Andrew W. Schloss in "An Unusual Effect in the *Canon Per Tonos* from J. S. Bach's *Musical Offering*," *Music Perception* 19, no. 2 (2001), 141–53.

