Changing Musical Time at the Beginning of the Renaissance (and Today)

Michael Scott Cuthbert

Arriving at Villa I Tatti for my fellowship year, I was greeted not only by warm *schiacciata*, the smiling faces of the staff, and the best-supplied early music library imaginable, but also by the passionate imploration of the director that we use our time not just to work on narrow projects, but also to read and think as broadly as possible. I therefore would have liked to write about musical rhythm, meter, and notation in their most general forms and throughout all lands and periods, but, alas, the prohibition against essays exceeding a few thousand words in this collection forces me to limit the subject merely to Europe and the last thousand years. I hope that nonetheless the spirit of Joe's suggestion of broad learning carries through even in this narrow scope.

One of the fundamental changes in the West's conception of music over the previous millennium was the idea that music's rhythm and meter could be precisely measured not in terms of seconds or minutes, nor in borrowed notions such as poetic feet, but in purely musical terminology like quarter notes or dotted eighth notes. This new way of thinking is intimately connected to the rise of musical notation, and in particular the use of notation to show relationships among two or more coordinated parts. Pitch needed its own vocabulary even in the era of unwritten music – organs needed to be built, and lyres tuned – but the necessity of specific terminology for musical rhythm arose only when it was written down. And while the notation of pitch became largely standardized within the first few centuries of the last millennium to the point where undergraduate music students can (more or less) read pitch from thirteenth-century manuscripts, rhythmic notation remained unsettled for much longer.

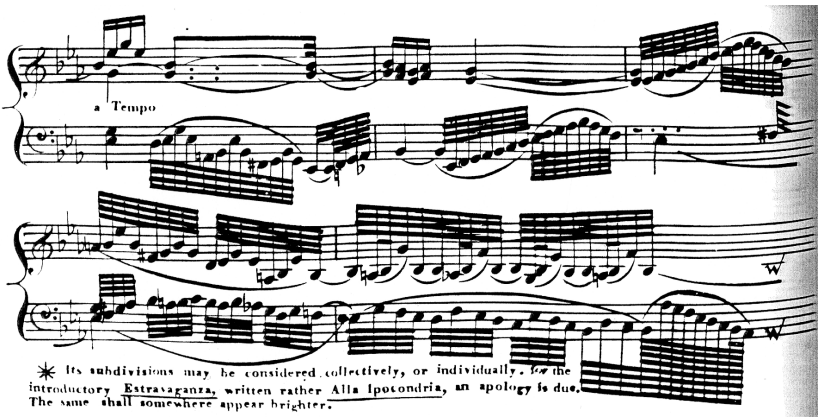
Seemingly from the first moment when music became measured (*musica mensurata*), it began to slow down. The earliest measured music, that of Leonin and Perotin, the twelfth- and early thirteenth-century composers

of Notre Dame in Paris, used the figure of the 'long' as a basic value, to be paired up and combined into a *maxima* or *duplex* long, or to be divided into three breves. By the late thirteenth century, music had slowed to such an extent that the breve became the basic note value, and the semibreve, worth either one-half or one-third the value of the breve, sprang into use.[1] This word, semibreve, is still the most common name in the British world for the note that in the United States is called the whole note. Because the process of slowing continued unabated, this note is now the longest value in frequent use. By the fourteenth century, the tempo of music had slowed sufficiently that a note even faster than the semibreve needed to be introduced. This note came to be called the *minima* or minim – still the British word for half note – signifying that this was to be the minimum; that is, the final, indivisible, smallest possible note. (The debates of the music theorists of the Trecento are echoed in the discussions of modern physics that postulate that time itself may move in discrete and indivisible *minima*, each lasting about one 200,000,000,000,000,000,000,000,000,000,000,000,000,000,000th of a second.) But the force of the slowing trend could not be stopped: it was less than fifty years later that the first 'semiminim' would appear. Its name embodies a contradiction, "half of the shortest possible note", yet though it was an extremely fast note for its time, it eventually became our most basic beat, the quarter note or crotchet.

The process of slowing itself slowed slightly during the fifteenth, sixteenth, and seventeenth centuries, and the slowing of tempo practically halted thereafter. Faster notes continued to be introduced in the following centuries, but the fundamental tempos of music changed little. There are exceptional pieces, however, and in some of these cases the slowness of the fundamental beat and the speed of the shortest notes produced dramatic effects: tuplet 128th notes appear in Ludwig van Beethoven's third piano concerto, 256th notes in a concerto by Antonio Vivaldi (F.IV. no. 5), and most exceptionally, 1,024th notes (incorrectly notated as 2,048th notes) in the little-known "Toccata Grande Cromatica" from *The Sylviad* by Anthony Phillip Heinrich

1. On attempts to measure the slowing of medieval musical time in terms of clock time, see Marco Gozzi, "New Light on Italian Trecento Notation, part 1", *Recercare*, XIII, 2001, pp. 5–78.

(ca. 1825), a piece that in its own continual slowing of the fundamental beat is a microcosm of all of the notated music history of the West (Example 1).[2]



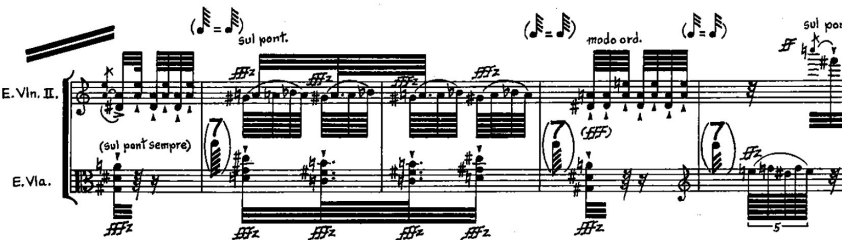
Example 1
Excerpt from Anthony Phillip Heinrich, "Toccata Grande Cromatica" from *The Sylviad*, ca. 1825, with 512th and 1,024th notes (incorrectly notated as 1,024th and 2,048th notes) at the end of the example.

Between Perotin and Heinrich, there exists a range of time that is almost incomprehensible to our sense of how music unfolds. Within a single *maxima*, there are 1,024 128th notes, and, as we have seen, even longer and shorter notes have occasionally been used. Fig. 1 shows (on a logarithmic scale) the amount of time various notes would take if they were all played at the same adagio tempo of one quarter note per second. Obviously it is absurd to use the entire range of note values in a single piece at a single tempo mark; in fact, the pieces using the shortest notes tend to have the

2. The source for these (and many other) extremes of musical notation is Donald Byrd's excellent online resource: www.informatics.indiana.edu/donbyrd/CMNExtremes.htm. I thank him for many stimulating conversations on this topic. The score of Example 1 has been republished recently as ANTHONY PHILLIP HEINRICH, *The Sylviad, or, Minstrelsy of Nature in the Wilds of North America: Opus 3,* intr. J. BUNKER CLARK, Greenleaf 1996. The term "chromatic" in the title of the piece may refer not only to notes out of the key, but also to the amount of ink (or color) needed to express the short notes in the work.

slowest tempos, and the contrary is true for pieces with the longest notes. Nonetheless, the enormous pull towards expanding the range of rhythmic resources that composers have felt over the centuries can be seen in Fig. 1.

In contemporary art music, composers have played with all extremes of lengths, but the most significant innovations in notation have come, as they did in the Middle Ages and Renaissance, in the notation of the most fleeting notes.[3] One of the most interesting case studies in the continuation of the medieval tradition of shorter notes comes in the American composer George Crumb's string quartet *Black Angels* (1970), where, in the excerpt shown in Example 2, he uses a time signature of $\frac{7}{128}$ in measure 2 written with the denominator as a note ($\frac{7}{}$), along with the almost equally unusual $\frac{7}{64}$, with each note receiving an equal accent, thus providing the shortest non-compound meter ever published.



Example 2
Unusually short beat values in George Crumb's *Black Angels* (New York 1971).

Other unusual and brief meters appear occasionally in modern music. Karlheinz Stockhausen's 1956 composition *Zeitmaße* uses meters that are nearly as short as Crumb's, such as $\frac{2}{32}$. Composers allied with the New Complexity school of the 1980s, including Brian Ferneyhough and Thomas Adès, have used meters such as $\frac{5}{6}$ and $\frac{2}{10}$ that allow 'tuplet' values (in these cases, triplets and quintuplets) to be fundamental and independent units. Finally, though multiple simultaneous meters were used in the

3. On uses of extremely long durations in recent music, see ALEX REHDING, "The Discovery of Slowness in Music", forthcoming.

works of both Johann Sebastian Bach and Wolfgang Amadeus Mozart, the metrical experiments of Conlon Nancarrow use multiple meters in ways that particularly stretch the definition of meter. His *"Transcendental" Etude* contrasts two canonic lines whose rhythms are in the ratio of the transcendental irrational numbers *e* to π.

The unusual ways of specifying beat and meter in today's music are not recent innovations. The same spirit of experimentation and development was at work throughout the past millennium. Nowhere was the lack of notation specific enough to express all the musical devices composers and performers could dream of more clearly felt than in the Italy of the Great Papal Schism (1348–1417), a period in music commonly identified with the *ars nova*. During this time, two conflicting systems of rhythmic notation coexisted: a largely international system, often called French notation, and a homegrown system called Italian or Marchettian (after the early fourteenth-century theorist Marchetto da Padova, who first documented the latter system). Even though Marchettian notation was more common in sources of the mid-Trecento than in later sources, contrary to previous reports there is little evidence that international notation was ever absent.

Composers chose a system of notation depending on which one made it easier or even possible to notate their rhythms. The international system made the notation of triple-time rhythms simpler and made syncopations, that is, displacements of the beat, across metrical units (one could say, across the bar line, except that such organizing devices did not yet exist) possible. The Marchettian system and its later expansions made dotted figures and syncopations within a metrical unit simple to notate. Notation in turn influenced composition and nudged composers into writing the types of piece that were easier to set down on parchment or paper.

Each of these two systems had its own way of notating changes in meter. (Only changes within a piece are relevant to the notation system since the initial meter of each work was rarely specified). The Marchettian system used letters that stood for the number of minims within a breve, e.g., ".q." for *quaternaria* or 4, ".d." for *duodenaria* or 12. The international system used a collection of signs that showed how the fundamental unit of the breve was to be divided (called mensuration). The signs have been presented in our history texts as a standardized group of four – ⊙, ◯, ☾, and ☾ – but close examination of the manuscript evidence shows that there was a wide variety of symbols and meanings, a diversity that included important regional

variants (such as the Veneto usage of ⊃ and ⊂ for the meanings usually associated with ⊂ and ⊙ respectively). These variants have been regarded as scribal errors and overlooked by our modern editions, but should instead be regarded as attempts at systemization by intelligent scribal editors who lacked an international standard.[4]

Quite possibly because of differences in meaning within the international system of mensuration signs, even Italian pieces that used the international rhythmic system often retained the Marchettian meter signs. This practice is sometimes referred to in modern literature as "mixed notation", and reflects an important transition point in the history of musical rhythm and notation that has long been studied for what it might say about changing notations of foreign influence and Italian identity. But a recently discovered piece uses a quite different form of mixed notation that further complicates the mysteries of influence and notation in this period, and the remainder of this paper explores this singular example of scribal initiative and notational innovation.

The cover of the register "Ravi 3", preserved in the Fondo Vicariato di Gavorrano (1568–69) in the Archivio di Stato in Siena, is a bifolio of an otherwise lost musical source from the period of the Great Papal Schism. The fragment contains parts of seven pieces, of which five were transcribed by Agostino Ziino in the article announcing its discovery.[5] A further piece, the cantus of a Gloria, was first transcribed by Marco Gozzi and later identified as the missing part of a work long known from a fragment in Madrid and a recently discovered folio in Columbia, South Carolina.[6]

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4. Michael Scott Cuthbert, *Trecento Fragments and Polyphony Beyond the Codex*, Ph.D. diss., Harvard University 2006, p. 225, to be discussed in more detail in a forthcoming monograph. The most significant work on these signs to date is Jason Stoessel, "The Interpretation of Unusual Mensuration Signs in the Notation of the *Ars subtilior*", in *A Late Medieval Songbook and its Context: New Perspectives on the Chantilly Codex (Bibliothèque du Château de Chantilly, Ms. 564)*, ed. Yolanda Plumley and Anne Stone, Turnhout 2010, pp. 179–202. I thank him for sharing this work with me prior to its publication.

5. Enzo Mecacci and Agostino Ziino, "Un altro frammento musicale del primo quattrocento nell'Archivio di Stato di Siena", *Rivista Italiana di Musicologia*, XXXVIII, 2003 (i.e. 2006), pp. 199–225.

6. Marco Gozzi, "Liturgia e musica mensurale nel Trecento italiano. I canti dell'*Ordinarium*", in *Kontinuität und Transformation in der italienischen Vokalmusik zwischen Due- und Quattrocento*, ed. Sandra Dieckmann *et al.*, Hildesheim 2007, pp. 53–98. Michael Scott Cuthbert and Elizabeth Nyikos, "Style, Locality, and the Trecento Gloria: New

The last piece that remained untranscribed is the focus of this study on changes in rhythmic notation – a unique lauda, *O regina…sempre regna*, in an extremely poor state of preservation, containing only one of its two or three voices. Previously identified as a lauda in ballata form,[7] it could very well be a madrigal instead, given that it possesses the two key features of the late fourteenth-century madrigal. Like most madrigals, it has extended melismas on the first and penultimate syllables of most lines and a change of meter after the midpoint of the piece, where, if it were a madrigal, the ritornello would begin.

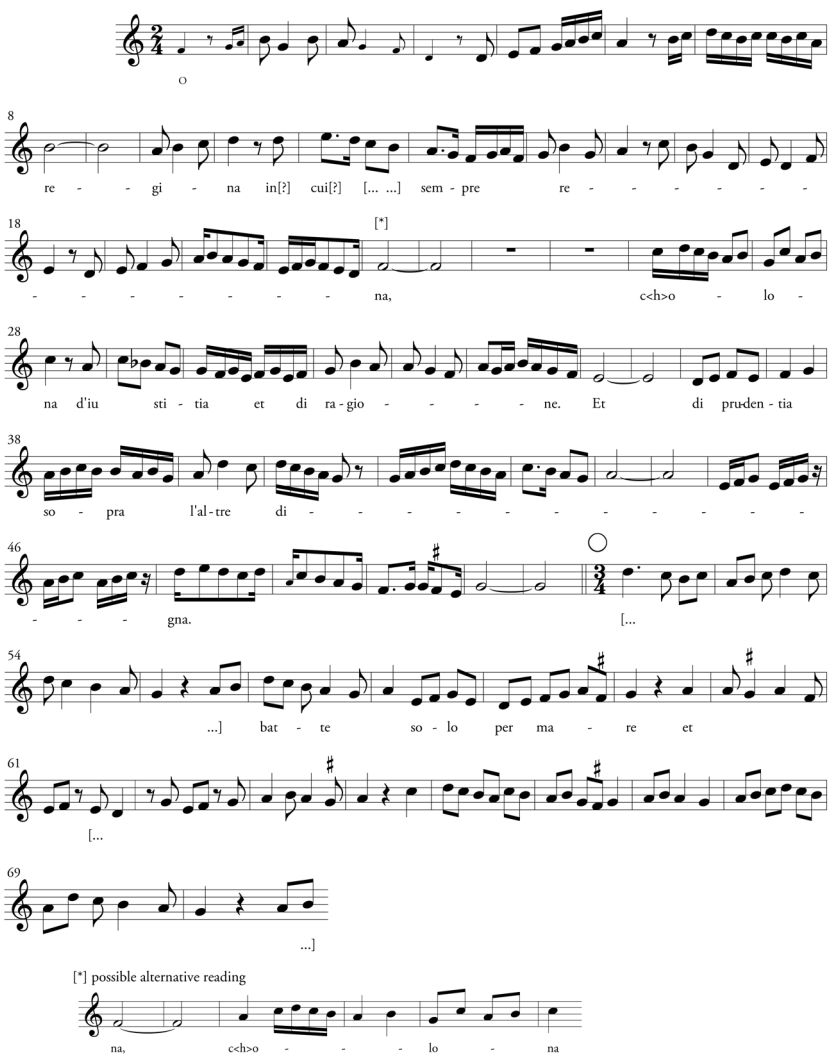
This change of meter is the most unusual feature of the piece. *O regina… sempre regna* uses a unique type of mixed notation. Although the rhythm of the piece is Marchettian, the switch from *tempus perfectum* to *tempus imperfectum* (from $\frac{2}{4}$ to $\frac{3}{4}$) is accomplished by means of the international meter sign, ◯.[8] Although the piece is extremely damaged, rendering much of the text illegible, there are only a few notes of the music that cannot be read. The piece is thus transcribed with the surviving text in Example 3, while a facsimile of the relevant section of the manuscript is in Fig. 2.

As a whole, the lauda appears commonplace and uncomplicated. Aside for a predilection for using syncopation at different levels and in both mensurations (and a lack of interest in accurate text-setting that suggests later fifteenth-century practice), little about the work seems remarkable, though of course without the other voice all aesthetic judgments are tentative. (After all, what would we think about Johannes Ciconia's masterly *Aler m'en veus* were it not for the second voice found only in a later contrafact?)

Sources and a Reexamination", *Acta Musicologica*, LXXXII, 2010, pp. 185–212.

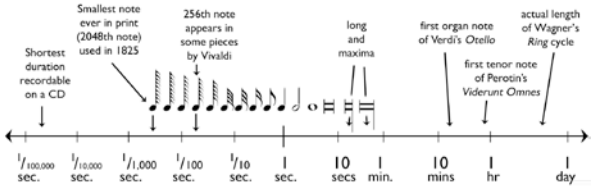
7. Mecacci and Ziino (as in n. 4), p. 207. Note, however, that the piece is not a contrafactum of any known ballata or madrigal.

8. Gherardello's *Intrando ad abitar* in Paris, Bibliothèque Nationale de Paris, MS Ital. 568, fols. 27v–28r, is said to be an example of the related phenomenon, using a mixture of French and Italian metrical signs in a piece notated in international notation. However, the Italian *divisionis* sign seems to me both a later addition and a mistake, since the meter does not actually change at this point. Cf. John Nádas, *The Transmission of Trecento Secular Polyphony: Manuscript Production and Scribal Practices in Italy at the End of the Middle Ages*, Ph.D. diss., New York University 1985, p. 323.

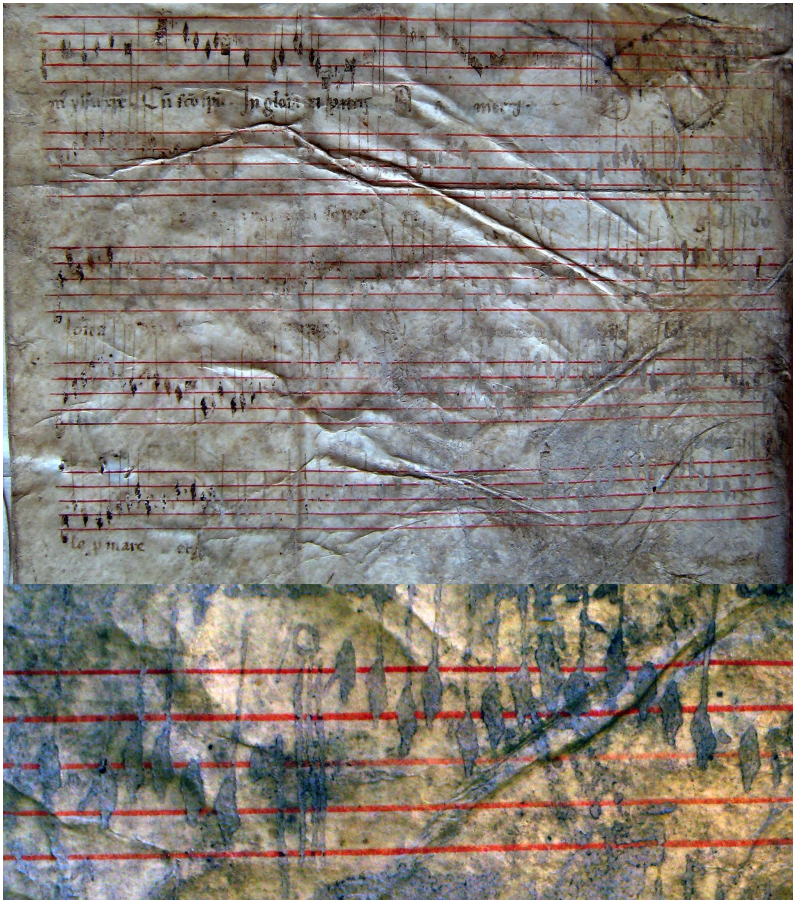


Example 3
O regina…semper regna, Archivio di Stato di Siena, Ravi 3, fol. 70v, tentative transcription by Michael Scott Cuthbert.

It is precisely the unremarkable nature of *O regina*, and the fragment in which it is contained, that make it so fascinating in its role as a unique testimony to a key transition moment in the long history of musical rhythm. While some inflection points and extreme moments in the history of notation have come at the hands of great masters, such as Beethoven, Giuseppe Verdi, and Perotin, many others are found hidden in texts by minor figures such a Anthony Heinrich and the anonymous creator or creators of this lauda. Broad readings in music history that include studying both major and minor works are essential to understanding how our own modern conceptions of musical time came to be formed.



1. Lengths of different note values at M.M. qtr. = 60 (with actual CD frequency and *Ring* lengths for reference).



2. Grazing-light detail of *O regina…sempre regna*, with computer-enhanced detail of the meter change on the fourth staff. Archivio di Stato di Siena, Ravi 3, fol. 70v.