

Theory in Practice: Reminiscences of Gaffurius' Music Theory in the Milanese Choirbooks*

Saskia C. M. M. Rolsma

FRANCHINUS GAFFURIUS (1451–1522) was already a well-known music theorist when he settled in Milan in 1484. During his nearly forty years as *maestro di cappella* at Milan Cathedral he is known to have compiled several choirbooks. Of these, the four that still survive are known as the Gaffurius Codices. My aim in the following contribution is to explore to what extent Gaffurius the music theorist left traces of his theoretical thinking in the ‘practical’ works of Gaffurius the musician.

The Sources

In the Veneranda Fabbrica del Duomo in Milan are kept four late-fifteenth- to early sixteenth-century choirbooks (MilD 1–4, *olim* 2266–2269).¹ These manuscripts are known as the Gaffurius Codices, not only because they are the single most important group of sources for compositions by Gaffurius, but more particularly because he was the compiler. The first codex explicitly confirms this, as is apparent from the following colophon:²

Liber capelle ecclesie maioris Mediolani factus opera et solicitudine Franchini
Gaffori laudensis prefecti prefate capelle impensa vero ven[erande] fabrice dicte
ecclesie anno Domini MCCCCCLXXXX die 23 junii.

The choirbooks contain masses and mass sections, Magnificats, and motets. The latter are either free-standing or arranged in motet cycles, including the so-called ‘motetti missales’. Except for the two Italians Gaffurius and Coppinus, all the composers of these motet cycles were born in the Low Countries and had been active at Milan for at least a decade before Gaffurius arrived on the scene. It is fair to assume that the contributions of Loyst Compère and Gaspar van Weerbeke³—most works of known authorship are by them—date from the years they were employed at the court of Galeazzo Maria Sforza (b. 1444, duke 1466–76). In particular, the five *motetti*

* I am very grateful to Prof Rob Wegman (Princeton University) for commenting on an early version of this article.

1. These four books were compiled between 1490 and 1520–5.

2. This colophon is written down on parchment that contains also the content of MilD 1. This parchment is kept separately from the first choirbook (MilD 1) in the Archivio della Veneranda Fabbrica del Duomo with the signature ‘Librone m. 1, allegato’.

3. In the period 1474–7, Gaspar van Weerbeke (c.1445–after 1517) and Loyst Compère (c.1445–1518) both worked at the court of Galeazzo Maria Sforza (1466–76).

missales cycles (three by Compère and two by Weerbeke) must have been composed for the duke.⁴

The influence of the theorist Gaffurius is not apparent in the distribution of the repertoire across the four choirbooks. That is to say, the collections do not appear to have been arranged according to theoretical or didactic criteria. MilD 1, which according the above cited colophon dates from 1490, contains mostly Magnificats, hymns and motets. Of the same date is MilD 2, which is largely devoted to masses and mass movements. MilD 3 must have been compiled a few years after the first two books; it contains Magnificats, hymns, and motets as well as masses and mass movements and therefore can be seen as a continuation, or updating, of the first two books. MilD 4 can be dated at least a decade after MilD 3, probably around 1520–5, and it, in turn, can be viewed as a continuation of the latter. Only one kind of setting is found in all four choirbooks: motets dedicated to St Ambrose, the patron saint of the city and diocese of Milan.⁵

Within the choirbooks themselves there is also no clear indication of any theoretically based repertorial arrangement. For example, the first choirbook starts with a group of Magnificats separated by a group of hymns. In neither of these two genres—Magnificats and hymns—is a theoretically based order, such as a modal organization, imposed on the repertoire.⁶

Four Exercises

Moving from overall repertorial arrangement to individual compositions, we can at last observe the workings of the mind of Gaffurius the theorist, at least in the compositions of his own hand. These works are of interest particularly with regard to mensuration and proportion, and the passages that concern us here are best described as exercises: passages in which Gaffurius plays with unusual proportions, either simultaneously or in succession. There are examples of such exercises in the following works: the motet *O beate Sebastiane*, the *Missa Montana*, and two *Missa Sine nomine* settings.⁷

In the four-voice motet *O beate Sebastiane* there is a short passage in which different proportions occur simultaneously in different voice-parts. In bar 114 the discantus moves into 5/2 proportion (see Example 1), and shortly after that into 3/2 proportion. Meanwhile the other three voices are kept in *tempus imperfectum diminutum*, with black notation calling for 3/2 proportion. In his *Practica musice* of 1496, Gaffurius confirms that *sesquialtera* (3/2) may be notated by means of black coloration.⁸

4. The three *motetti missales* cycles from Compère are *Ave domine Ihesu Christe* (MilD 1, fos. 162^v–170^r), *Hodie nobis de virgine* (MilD 1, fos. 171^r–179^r), and *Missa Galeazescha* (MilD 3, fos. 125^v–135^r). The two of Weerbeke are *Ave mundi domina* (MilD 1, fos. 126^v–134^r) and *Quam pulcra es* (MilD 1, fos. 134^v–143^r).

5. The motets with a text dedicated to St Ambrose are *O beata presul* (MilD 1, fos. 108^v–109^r and MilD 2, fos. 6^v–7^r), *Vox infantis sonuit dignus / O doctor optime presul dignissime* (MilD 3, fos. 218^v–220^r) and *Ambrosi doctor venerande / Domini furorum* (MilD 4, fos. 68^v–70^r).

6. For a list of content see *Milan, Archivio della Veneranda Fabbrica del Duomo, Sezione Musicale, Librone 1 (olim 2269)*, Howard Mayer Brown (ed.), RMF, vol. 12a (New York and London, 1987), pp. ix–xiii.

7. *O beate Sebastiane* (MilD 1, fos. 93^v–95^r), *Missa Montana* (MilD 3, fos. 110^v–116^r) *Missa Sine nomine* setting (MilD 2, fos. 176^v–181^r, and MilD 4, fos. 41^v–47^r).

8. Gaffurius, *Practica musice* (1496), bk. 4, ch. 5 (online version Thesaurus Musicarum Latinarum, School of Music, Indiana University <<http://www.chmtd.indiana.edu/tm1/15th/GAFPM4.TEXT.html>>): ‘Solet plerumque sesquialtera proportio in cantilenis absque numerorum characteribus denotari: quum scilicet notulis nigro vel alio colore plenis...’. Translated by Clement A. Miller, *Franchinus Gaffurius: Practica musicae* (MSD 20; [Dallas], 1968),

Example 1. Gaffurius, *O beate Sebastiane* (MilD 1, fos. 93^v–95^r), bb. 110–22

[D] 110

Tu - um o - ra fi - li - um pro -

Ca fi - li - um pro - sa - lu - te (pro -)

T um o - ra fi - li - um pro - sa -

Cg (o - ra fi - li - um

117

- sa - lu - te fi - de li - um

- sa - lu - te) fi - de li - um

- lu - te fi - de li - um

pro - sa - lu - te fi - de li - um

In this passage it is necessary for the $5/2$ proportion to be followed, not by coloration, but by a $3/2$ proportion. For if coloration had been employed, this would have established a proportion relative to the preceding $5/2$ proportion, and would thus have resulted, cumulatively, in a proportion of $5/2 \times 3/2 = 15/4$. The only way to get the discantus in line with the other voices was to write out the numerical proportion $3/2$, *sesquialtera*.⁹ These exercises are possible because Gaffurius, like Tinctoris, advocated mimim equivalence.¹⁰

In his *Missa Montana* Gaffurius does something different. In the Credo there is a passage in which three of the four voices move in *tempus imperfectum diminutum*. The fourth voice, the tenor, changes for a short while into a 2/3 proportion.

176: '*Proprio sesquialtera* is frequently written in songs without any number but with notes which are blackened or filled in with another color...'.

^{9.} Gaffurius, *Practica musice* (1496), bk. 4, ch. 9: ‘Duplasesqualteria proportio fit quam maior sequentium notularum numerus ad minorem praedentium ductus continet eum bis et insuper dimidiam ipsius partem: aequivalens ei in potentia et temporis mensura: ut .5. ad .2. et .10. ad .4. et .15. ad .6. et deinceps. In hac proportione quinque notulae aequivalent et commensurantur duabus sibi consimilibus nomine et quantitate: ita ut unaquaeque notula ipsarum quinque diminuat de tribus quintis partibus. propriae quantitatis.’ Miller, *Franchinus Gaffurius: Practica musicæ*, 208 abridges the passage: ‘In *proprio dupla sesquialtera* the larger number in proportion to the smaller contains the smaller twice and one-half more, and becomes equal to it in value and measurement. In this proportion five notes become equal in measurement to two of the same name and value, so that each of the five loses three-fifths of its value. The proportion is written in songs in this way: 5 to 2, 10 to 4, 15 to 6...’

10. Anna Maria Busse Berger, *Mensuration and Proportion Signs* (Oxford, 1993), 230–1. According to Busse Berger the theoretical principles that Gaffurius, following Tinctoris, strove to establish can be observed in five different areas of notation. In both perfect and imperfect time they advocated minim equivalence; they also favoured this equivalence in minor and major prolation of the same *tempora*. Because they placed the *mensura* on the imperfect semibreve in all mensuration signs, Tinctoris and Gaffurius were able to compare semibreves in all proportions. And lastly they thought that a proportion sign always needs two numbers.

Example 2. Gaffurius, *Missa Montana*, Credo (Mild 3, fos. 112^v–114^r), bb. 39–48

In b. 47 the proportion in the tenor changes from $2/3$ into $3/2$, as can be seen in Example 2. This latter sign does not establish *sesquialtera* as a proportion in its own right, but rather cancels out, cumulatively, the preceding *subsesquialtera*, and therefore changes the mensuration back to its point of departure. In his *Practica musice* Gaffurius states that a proportion can be annulled by its inversion.¹¹ This is an indication that he favoured minim equivalence.

Gaffurius used the same technique in the second Agnus dei of *Missa Sine nomine* [4], where the proportion sign of the discantus changes from $2/3$ to $3/2$. In the second Kyrie of the same mass the sign in the tenor changes from $2/7$ to $7/2$. Here too we have proportions cancelled out by their inversions.

In the *Missa Sine nomine* [2] there are different kinds of proportion exercises in the Christe, Sanctus, and Agnus dei. In the Christe Gaffurius employs the technique already illustrated in Example 2: the discantus has a short passage in $5/2$ proportion, and returns to the initial mensuration by means of its inversion, $2/5$. In the Osanna each of the voices has its own mensuration sign, as can be seen in Example 3, which shows the end of the Pleni sunt and the beginning of the Osanna.¹²

11. Gaffurius, *Practica musice* (1496), bk. 4, ch. 2: ‘Submultiplex enim opponitur Multiplici. Subsuperparticulare Superparticulari et reliqua eodemmodo. Notanter dicimus submultiplex opponi multiplici: quia quod vnum efficit opposito succedente destrutitur...’ Miller, *Franchinus Gaffurius: Practica musicae*, 157: ‘Submultiplex is the opposite of multiplex, subsuperparticulare of superparticulare, and so forth. We say that submultiplex is opposed to multiplex because what the one creates the other removes...’ In the bassus of the Sanctus of the same mass there is a same kind of change in proportion.

12. The fragment does not have short strokes but dotted bar lines to clarify my interpretation.

Example 3. Gaffurius, *Missa Sine nomine*, Sanctus (MilD 2, fos. 185v–188r), bb. 70–81

The musical score for Example 3 consists of two systems of music. System 1 (bb. 70-73) starts with a 'Duo' section where all voices sing. The alto (A) and tenor (T) sing 'Pleni sunt', while the bass (B) rests. The bass then enters with 'san'. System 2 (bb. 74-76) shows a more complex rhythmic pattern. The alto and tenor sing 'na', while the bass rests. The bass then sings 'san', followed by '(o)', 'na', 'o', 'na', '(o)', 'san', 'na', and finally 'o'. The music uses various rhythmic signs, including semibreves, breves, and imperfect breves, often under different time signatures like C, F, and G.

How to make sense of this extraordinary passage?¹³ All signs make sense not only in relation to one another, but also in relation to the preceding *Pleni sunt* section, which is notated in $\dot{\text{C}}$. The altus moves into *sesquialtera*, which normally means that three semibreves under $\dot{\text{C}} \frac{3}{2}$ are equivalent to two under $\dot{\text{C}}$, the breve therefore under $\dot{\text{C}} \frac{3}{2}$ becomes perfect for every theorist except Tinctoris. In this example, however, this is not confirmed by the breve rests in bb. 73–4, which are not to be reckoned perfect but imperfect. This can only mean that Gaffurius meant $\frac{3}{2}$ to signify that three imperfect breves under $\dot{\text{C}} \frac{3}{2}$ are equivalent to two under $\dot{\text{C}}$. At the level of the semibreve this makes no difference: two perfect breves under $\dot{\text{C}} \frac{3}{2}$ (in the first interpretation) are equivalent to three imperfect breves under $\dot{\text{C}}$ (in the second interpretation), since they both equal six semibreves, as opposed to four under $\dot{\text{C}}$ as shown in Table I.

The bassus sign $C \frac{3}{1}$ can also be explained straightforwardly. One semibreve under C equals two under $\dot{\text{C}}$. The proportion $\frac{3}{1}$ calls for three semibreves to become equivalent to one semibreve under C alone. Since this semibreve in turn equals two under $\dot{\text{C}}$, the sign used in the *Pleni sunt*, three semibreves under $C \frac{3}{1}$ are equivalent to two under $\dot{\text{C}}$. So the sign is really redundant: Gaffurius could just as well have used a simple *sesquialtera* in $\dot{\text{C}}$, as he did in the altus. Not surprisingly, the two voices match up perfectly.

¹³. I thank Jaap van Benthem for his help in solving this theoretical riddle.

Table 1. Relationship between the proportions in the Osanna of *Missa Sine nomine* by Gaffurius (MfD 2, fos. 185v–188r)

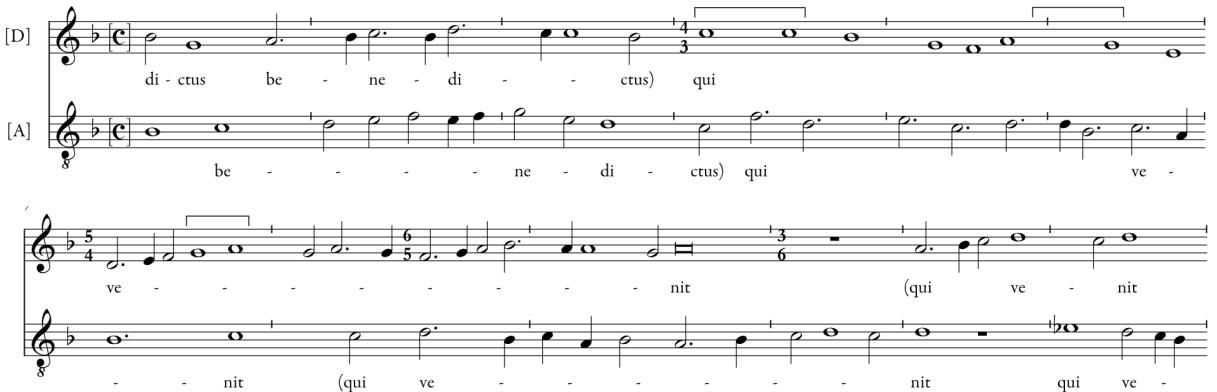
| | | | | | |
|----------------------------|----|---|---|----|---|
| $\dot{\Phi}$ | ■ | | | ■ | |
| | ○ | ○ | ○ | ○ | ○ |
| $\dot{\Phi} \frac{3}{2}$ | ■ | | | ■ | |
| | ○ | ○ | ○ | ○ | ○ |
| [■ ■ ■] | | | | | |
| $\dot{\Phi} \frac{3}{1}$ | ■ | | ■ | | ■ |
| $\dot{\Omega} \frac{3}{2}$ | ■. | | | ■. | |
| | ○ | ○ | ○ | ○ | ○ |
| $\dot{\Theta} \frac{3}{2}$ | ○. | | | ○. | |

The discantus also matches up with these voices: since O and C are semibreve equivalent, they will remain so in diminution, under the signs $\dot{\Phi}$ and $\dot{\Theta}$ respectively. If $\dot{\Phi} \frac{3}{2}$ (in the altus) makes three imperfect breves equivalent to two under $\dot{\Phi}$ alone (that is, altogether, six semibreves to four), then likewise $\dot{\Phi} \frac{3}{2}$ must make three perfect breves equivalent to two under $\dot{\Phi}$ (that is, altogether, nine semibreves to six). The end result is the same: a *sesquialtera* proportion, whether 6 : 4 or 9 : 6. Once again, the sign is redundant.

What was an imperfect breve under $\dot{\Phi}$ in the Pleni sunt should therefore become equivalent to three semibreves under $\dot{\Phi} \frac{3}{2}$ in the Osanna. However, the three imperfect breve rests at the beginning of the altus (Example 3, bb. 73–4) indicate that the semibreve in $\dot{\Phi} \frac{3}{2}$ and $\dot{\Phi} \frac{3}{1}$ stays the same, through which $\dot{\Theta} \frac{3}{1}$ is the correct notation of the redouble $\dot{\Phi} \frac{3}{2}$. $\dot{\Theta} \frac{3}{1}$ however is a theoretical notation, based on an identical length of the semibreve in all voices. In relation to $\dot{\Phi} \frac{3}{2}$ the proportion $\dot{\Theta} \frac{3}{2}$ should be written down as $\dot{\Phi} \frac{3}{2}$; the notation seen here in Example 3 is the notation in relation to $\dot{\Theta} \frac{3}{1}$.

In spite of the different mensurations the Osanna ends up sounding quite homogeneous, and could of course have been notated completely straightforwardly in a common sign like $\dot{\Phi} \frac{3}{2}$, the mensuration used in the altus. This Osanna only demonstrates how many semibreves and breves there are in the different mensuration and proportions signs.

In the two-voice Benedictus of the same mass, Gaffurius again plays with different proportions in the discantus (Example 4).

Example 4. Gaffurio, *Missa Sine nomine*, Sanctus (MID 2, fos. 185^v–188^r), bb. 109–20

The altus is notated in *tempus imperfectum* (C), providing a stable point of reference against which the proportional changes in the top voice can be verified. The discantus introduces a 4/3 proportion in this mensuration (b. 112), which is followed, first, by a 5/4 proportion (b. 115), then a 6/5 proportion (b. 116), and finally 3/6 (b. 117). The latter restores the discantus to its point of departure. The successive proportions 4/3, 5/4, and 6/5 each belong to a different species within the *genus superparticulare*, to which *sesquialtera* (3/2) also belongs.¹⁴ The 3/6 is a *proportio subdupla* within the *genus submultiple*, and is needed here to return back to the main mensuration sign. How does that work? As seen in Example 2, the *sesquialtera* 3/2 is neutralized by 2/3, a *subsesquialtera*: $3/2 \times 2/3 = 6/6 = 1/1$. The product of the numerators of 4/3, 5/4, and 6/5 is 120 ($4 \times 5 \times 6$) while the product of the denominators is 60 ($3 \times 4 \times 5$), resulting in a cumulative proportion of 120/60 or 2/1.

Gaffurio employs chains of cumulative proportions in the two voices of the Agnus dei II of the same mass too, though this time he also introduces changes in species (Example 5). The discantus and altus are both notated in *tempus imperfectum diminutum*. In the discantus the proportion chain is 3/2 (b. 81), 5/3 (b. 88), 6/5 (b. 90), and 2/6 (b. 93).¹⁵

Example 5. Gaffurio, *Missa Sine nomine*, Agnus dei (MID 2, fos. 188^v–191^r), bb. 74–103

¹⁴ Gaffurio, *Practica musicae* (1496), bk. 4, ch. 5: 4/3 is a *proportio sesquitertia*, 5/4 is a *proportio sesquiquarta*, and 6/5 is *proportio sesquiquinta*. These terms, of course, go back through Tinctoris to antiquity.

¹⁵ Ibid. 4: 2: 3/2 and 6/5 belong to the *genus superparticulare*, 5/3 to the *genus superpartiens*, and 2/6 is *submultiple*. At the same time Gaffurio changes the altus sign to 3/4 (b. 81), to 6/3 (b. 88), and finally to 4/6 (b. 93); 4/3 belongs to the *genus superparticulare*, 6/3 to the *genus multiple*, 4/6 belongs to the *genus subsuperparticulare*.

The image shows three staves of musical notation from Gaffurius' Practica musice. The notation is in common time (indicated by a 'C') and uses a treble clef. The first staff begins at measure 88 and ends at measure 92. The second staff begins at measure 93 and ends at measure 97. The third staff begins at measure 100 and ends at measure 104. The notation includes various mensural signs: 'no' (a single vertical bar), 'bis' (two vertical bars), and 'mi-se-re-re-no' (three vertical bars). Measures 93 and 97 feature lyrics corresponding to the mensural signs. Measure 100 concludes with '(bis)' and measure 104 with '(bis)'.

Conclusion

The use of these proportions may well have been didactic in intent. Example 3 would appear to support this supposition: Gaffurius introduces four different signs in a section so homogeneous, in contrapuntal style, that it could just as well have been notated under one sign, $\text{C} \frac{3}{2}$. In other words, three of the signs are redundant. In the other examples, by contrast, the proportional rhythms could not have been notated more efficiently. In music history such kinds of didactic demonstrations are of course not unique. Tinctoris and Fayrfax, in particular, spring to mind in this regard.¹⁶

Gaffurius finished his theoretical work *Practica musice* when he was working in Milan. During the same period he must have started the compilation of MilD 1 and MilD 2. The compositions that contain mensuration exercises—*O beate Sebastianae*, the *Missa Montana*, and the two *Missae Sine nomine*—are unique for these choirbooks, and have not so far turned up anywhere else. These settings seem to provide a direct link between the choirbooks and *Practica musice*: the teachings on proportion set forth in bk. 4 of *Practica musice* are given practical demonstrations in the above-named compositions in the choirbooks. It seems that Gaffurius not only was concerned to demonstrate his theory in the short examples provided in *Practica musice*,

16. Bonnie J. Blackburn, in 'A Lost Guide to Tinctoris's Teachings Recovering', *EMH* 1 (1981), 29–116, writes about MS PerBC 1013 and especially Tinctoris's pedagogical motet *Difficiles alios delectat pangere cantus*. In SegC s.s. there are at least three duos of Tinctoris in which he plays with different proportions after and above each other. An edition of this manuscript is to be found in Norma Klein Baker, 'An Unnumbered Manuscript of Polyphony in the Archives of the Cathedral of Segovia: Its Provenance and History', 2 vols. (Ph.D. diss., University of Maryland, 1978), i. 240–59. In ch. 5 Baker gives for all compositions the number, title, number of voices, (possible) attribution, voice incipits, concordant sources, and remarks; in vol. ii she transcribes those compositions in SegC s.s. that in 1978 were not to be found in modern editions. Here Tinctoris's duos can be found: no. 156 *De tous biens playne* (fo. 202^r), no. 158 *Le souvenir* (fo. 203^r), and no. 161 *Tout a par moy* (fo. 204^r). The English composer Robert Fayrfax (23 Apr. 1464–24 Oct. 1521?) composed his five-voice *Missa O quam glorifica* to obtain a doctorate from Cambridge University. In this mass each movement has two different mensuration signs, and within the voices he plays with proportions. This mass is to be found in the 'Lambeth' choirbook and has the inscription 'for his forme in proceeding to bee doctor'. An edition is to be found in CMM 17/1: 64–103. See also Roger Bray, 'Music and the Quadrivium in Early Tudor England', *ML* 76 (1995), 1–18, especially the appendix 'The Structure of Fayrfax's Mass *O quam glorifica*' (pp. 15–18). I thank Dr Eric Jas for bringing Fayrfax to my attention.

but also meant them to be exemplified in longer compositions. They thus serve as reminiscences of the theorist Gaffurius in his 'practical' works.