The Names of Jacobus*

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Jacobus: he is the man who identified himself as the author of *Speculum musicae*, but did so only by sharing his first name, leaving it to posterity to discover the rest.[1] To date we have not succeeded in identifying him, not securely at any rate. Yet it would be a great step forward if we could find out more about Jacobus from sources other than his treatise. For that purpose it would be necessary to know his full name. If we had it, at least, we might stand a realistic chance of finding a documentary trail, putting together a tentative biography, and resolving some of the mysteries surrounding the *Speculum*. But that is easier said than done. Names are liable to attract false namesakes, strangers who can spend years comfortably nestled in our biographical accounts.[2] And sometimes individuals were liable to attract multiple last names, seemingly belonging to different people.

Yet the effort is worth it. Jacobus was a one-of-a-kind person. He stands out as one of the most formidable figures in the history of Western music theory. He is our key witness to major changes in rhythmic notation that were initiated in the 1310s. The major players in this development were Philippe de Vitry and Johannes de Muris. Their treatises are short, and present a body of rapidly evolving theory that comes across in its totality as contradictory and inconsistent. Jacobus would exploit this against them. He did not have a high opinion of either man's work. In Book VII of *Speculum musicae* he left a detailed commentary on their theories, exposing every last flaw and contradiction he had detected—all the while praising the old notation and lamenting its exile from the 'homeland of singers'.

Jacobus had a mission in this life. His ambition was to undo the great harm inflicted by new theorists on the art of music. 'If only it would please modern singers', he sighed, 'to call back into use the old art, the old songs, and the old manners of singing'.[3] Jacobus passionately urged his readers to reject these blights on the tradition of mensural music. He spoke of his adversaries as *moderni*, a word that derives its meaning from the opposition to its counterpart *antiqui*. The terms are a conceptual pair:

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1 Jacobus Leodiensis, *Speculum musicae*, ed. Roger Bragard, Corpus scriptorum de musica 3 (Rome, 1955-73).

2 The best-known example is Juschino, a singer active at Milan cathedral in 1459-79, whose false identification with Josquin des Prez added twenty years to the latter's career, an 'early period' in his biography that came to be populated with works that do not show up in manuscript sources until several decades later. See David Fallows, 'Josquin and Milan', in *Plainsong and Medieval Music* 5 (1996), 69-80. Another example is the Jean de Murs who, together with his father Henri, committed a murder at Meaux in 1310. Jean was sentenced to a seven-year exile on the island of Cyprus. See Ghislaine L'Huillier, 'Aspects nouveaux de la biographie de Jean de Murs', in *Archives d'histoire doctrinale et littéraire du Moyen Âge* 47 (1980), 272-76. Yet this man cannot be the same person as the music theorist. The convicted murderers were both natives of the diocese of Meaux, in the county of Champagne. Johannes de Muris, on the other hand, affirms that he was born in Normandy, in the diocese of Lisieux, some 215 km (135 miles) west of Meaux.

3 'Utinam placeat modernis cantoribus ut ars antiqua, cantus antiqui, modusque cantandi, ad usum revocentur.' *Speculum*, VII. xlviii. 5 (here and hereafter referring to book, chapter, and, where given, section numbers).

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they define each other by mutual exclusion. As such they are also inevitably misleading. To juxtapose generations as *antiqui* versus *moderni* is to place the focus exclusively on what sets them apart, not on what they have in common. Like other tendentious metaphors in history, this juxtaposition found its way into everyday discourse and created the real antagonism that the words had only insinuated. Jacobus, buying into the rhetoric like everyone else, presented himself as the last of the *antiqui*, taking up a lone, despairing fight to free the world from the follies of the *moderni*.

Yet the rift had already become permanent. And *Speculum musicae* only widened it. Jacobus was not of a mind to yield to his opponents, and opted instead for a strategy of intellectual shock and awe—the regular discourse in academic disputation. He would not live to see the impact of his treatise, which as far as we know was minimal. The history of notation would move on as if he had never made the effort.[4] Still, *Speculum musicae* did enjoy a significant afterlife in the fifteenth and sixteenth centuries, as Bonnie Blackburn details in her companion article in this volume. And perhaps one could say that its glory days are now, when more and more scholars are exploring the riches of his work, and more and more musicians are performing the old repertory he so missed in old age.[5] Sadly we cannot do Jacobus the additional favor of turning back seven hundred years of notational history.

Jacobus and Historiography

The partisan perspective of Jacobus colors much of our understanding of what happened in the 1310s. But not always for the better. He followed scholarly convention in not mentioning living opponents by name. That was fine if there was just one opponent. But in the *Speculum* Jacobus speaks of multiple authors, each of whom he identifies as 'a certain teacher', or 'a certain *modernus*'. Since he structured his attack in terms of theoretical issues rather than individual authors, their writings ended up being chopped into pieces and cited in different places as his argument required. The consequence is that they dissolved into an indistinct collective. If one were to read the *Speculum* on its own, it would be hard to guess how many theorists he was actually arguing against. Nor

[4] Except possibly in Italy. See Heinz Ristory, *Post-franconische Theorie und Früh-Trecento: Die Petrus de Cruce-Neuerungen und ihre Bedeutung für die italienische Mensuralnotenschrift zu Beginn des 14. Jahrhunderts*, Europäische Hochschulschriften, ser. 36, Musikwissenschaft 26 (Frankfurt am Main, 1988). However, even in this part of the world, Marchetto of Padua had already theorized modified semibreves like ⧫ and ↑ in the 1310s. Vitry adopted these symbols from the beginning. For evidence that Marchetto was known at Paris, and had been read by Jacobus, see below, nn. 95 and 96.

[5] The literature is overwhelming, but the following are some of the more significant publications to have come out since 2010. The outstanding contribution is David Maw's 'Redemption and Retrospection in Jacques de Liège's Concept of *cadentia*', in *Early Music History* 41 (2010), 79-118. This is, along with Fabrizio Della Seta's '*Utrum musica tempore mensuretur continuo, an discreto:* Premesse filosofiche ad una controversia del gusto musicale', in *Studi musicali* 13 (1984), 169-219, among the studies that have done most to bring out the intellectual depth of Jacobus's understanding of music. Also, in chronological order, Margaret Bent, *Magister Jacobus de Ispania, Author of the* Speculum musicae, RMA Monographs 28 (Farnham, 2015); Karen Desmond, 'Did Vitry Write an *Ars vetus et nova*?', in *Journal of Musicology* 32 (2015), 441-93; John N. Crossley, 'The Writings of Boethius and the Cogitations of Jacobus de Ispania on Musical Proportions', in *Early Music History* 36 (2017), 1-30; Karen Desmond, '"One is the Loneliest Number…": The Semibreve Stands Alone', in *Early Music* 46 (2018), 403-16; Karen Desmond, *Music and the* Moderni, *1300-1350: The Ars nova in Theory and Practice* (Cambridge, 2018); John N. Crossley, Constant J. Mews, and Carol J. Williams, 'Jean des Murs and the Return to Boethius on Music', in *Early Music History* 49 (2021), 1-36; Elżbieta Witkowska-Zaremba, 'Johannes de Muris's *Musica speculativa* Cited by Jacobus de Ispania', in *Plainsong and Medieval Music* 31 (2022), 37-63; and Margaret Bent, '"Artes novae"', in *Music & Letters* 103 (2022), 729-52.

would it transpire that there were two leading figures who held almost opposite views—the same Muris and Vitry I mentioned a moment ago.[6] It is only from their own writings that we can get to know the positions they held. This has left the impression of the so-called 'ars nova' as a single, coherent movement, as though unified by a common manifesto, with members who subscribed to each other's ideas and were, as far as Jacobus was concerned, equally to blame for each other's mistakes.

This is the homogenizing perspective that Jacobus has left us. That perspective is false, yet it allowed him to poke fun at the *moderni* for their failure to maintain unity. To him, the infighting among them proved the instability of the new art. Yet the differences between Vitry and Muris had been fundamental from the beginning. Muris was a scientist. He would become famous as an astronomer, mathematician, and scholar of natural philosophy. What attracted him to music theory was the intellectual challenge of solving a major theoretical problem. It was the question of how to maintain the perfection of the late thirteenth-century notation system, as taught by Franco of Cologne around 1280, while solving its recent problems without harm to that perfection. His ideal was an updated version of the system that would be distinguished for its consistency and economy. Fewer notes would have to do the work of more, with a minimum of rules that should apply equally to all. That is a scientific aspiration. The eventual system, which he had fully worked out by 1321, was a triumph.[7]

Vitry was the exact opposite. What he brought was not conceptual economy but wasteful proliferation. There was no notational problem or he thought he could solve it with a new note shape, a new note name, or some other fanciful invention. This must have put him at the centre of what Jacobus called a 'great dissension' and I will refer to as the 'Quarrels of the Note-Shapes' of 1319.[8] Vitry had a flair for inventing new symbols,

[6] One of the 'certain teachers' does emerge as a distinct figure because of what Jacobus writes about him. He describes that person as arrogant, disdainful of those who do not sing according to his 'new art', ready to denounce them as 'crude, unschooled, foolish, and ignorant', and brazen enough to assert that all the old masters had walked in error. The unnamed author is proud of the subtlety of his own ideas, but according to Jacobus he posited 'many laughable things', and at times contradicted himself. See *Speculum*, VII. xxvi. 1-3, xlvi. 1, and xlvii. 7. Jacobus was referring to Philippe de Vitry, author of the treatise *Ars nova*. It is worth bearing this testimony in mind when dealing with Vitry's treatise. A man with the ambition and competitive instincts of Vitry was not going to share the stage of *Ars nova* with composers other than himself. It was *his* new art, and it was *his* motets that exemplified it. When he names motets without saying he composed them (or without other sources stating he did), they are technically of unknown authorship, but the *prima facie* assumption must surely be that they are his. All this ties in with something else we know about Vitry. He was the thin-skinned person who composed a full-blown motet to denounce a 'javelin-tongued hypocrite' called Hugo, 'prince of hatred' (*princeps invidie*), who had spoken ill of him in public. Given the strongly anti-mendicant sentiments expressed in the triplum, his target may have been Hugues de Vaucemin, master of the Dominican order from 1333 to 1341. The text is pure personal invective, unheard of in public discourse, and likely to undermine Vitry's standing as a public figure. From the lyrics we gather that Hugo, in his 'madness', had baselessly accused him 'before the people', that is, before layfolk. This must have been in a sermon, all the more so as Vitry counsels Hugo to stick to teaching those who are innocent of revealed truth, rather than attack those who are innocent of wrongdoing.

[7] See below, n. 11.

[8] *Speculum* VII. xxiiii. 5. See also below, n. 98. In the version of *Ars nova* that survives in Paris, Bibliothèque nationale, Ms. 15128 [Paris 15128], Vitry speaks of a hypothetical 'ignorant person' who has no clue what minims and semiminims are. He may well have meant some of his more stubborn opponents in the 'Quarrels of the Note-Shapes' rather than the average singer in the street. (Think only of Jacobus, who preferred to go through life in blissful innocence of such 'monstrosities'.) Ironically, Vitry then proceeds to enlighten that ignorant person by declaring that the semiminim can be recognized by a double upward stem on the lozenge-shaped semibreve:  . That information would prove useless only a few years later, when the flagged minim  became the universal symbol of the semiminim—making Vitry himself look ignorant in hindsight, exactly like Jacobus said. But at the time the semiminim was a theoretical construct with no obvious practical application, invented to claim new territory. (Note that Jacobus made a distinction between inventing a note purely as a matter of theoretical speculation, and applying it in musical practice. He could live with

and was quick to publish them.[9] Among his proposals, for example, we find such modified semibreves as  ,  , and  , as well as the new maximas  ,  ,  , and  , and the mensuration signs  ,  ,  ,  ,  , and  .[10] Yet he abandoned his eccentric inventions almost as quickly as he announced them. None of these symbols would last over time.

There is a reason why the stream of Vitry's novel shapes slowed down to a trickle and eventually dried up. Muris had removed all need for modified semibreves and modified double longas with his theory of imperfection. The only new note he chose to keep was the minim  , which he needed to be indivisible for the system to work. (Muris never mentioned the semiminim, which was Vitry's department.) The minim was to become the cornerstone of his theory of imperfection, a theory that should be called for what it is: a work of genius.[11] It was not long before Vitry began to promulgate the theory as well. Such was the absorbent nature of his new art: *Ars nova* could not continue to

the former, but resolutely condemned the latter. Cf. *Speculum*, VII. xxiii. 12 and xlv. 8.) Around 1320 there could have been little need for semiminims in musical practice, as it would have been almost impossible to sing them at the speeds then current. See Philippus de Vitriaco, *Ars nova*, ed. Gilbert Reaney et al., Corpus scriptorum de musica 8 (Neuhausen-Stuttgart, 1964), 86. It is therefore important to distinguish between the semiminim's first mention in theory and its first known use in musical sources. More on this in Karen Cook, 'Theoretical Treatments of the Semiminim in a Changing Notational World c. 1315-c. 1440' (Ph.D. diss., Duke University, 2012).

9 Many of the new symbols are modified semibreves. Their modifications were meant to distinguish between semibreves of different durations when they were pressed together within the fixed duration of a breve. In the earliest versions of *Ars nova* Vitry is still thinking within the framework of Petrus de Cruce. As I hope to show elsewhere, Muris would render that framework obsolete with his theory of imperfection. The key here is Franco of Cologne's conception of note-values in terms of the Aristotelian system of classification, involving *genera*, *species*, *definitiones*, and *differentiae*. The terms *minima* and *semiminima* originated as adjectives to the noun *semibrevis* (itself an adjective modifying the genus *nota*). Vitry and Jacobus understood *minima semibrevis* and *semiminima semibrevis* as species of semibreve, being the smallest and less-than-smallest semibreves, respectively, comparable to their sibling species *maior semibrevis*, *minor semibrevis*, and others. Yet the early debates would soon run into confusion, as there was a second possible noun to which the adjectives could apply. Muris proceeded from the fundamentally different premise that the minim is the *minima nota*, that is, a species of *note* along with its sibling species longa, breve, and semibreve. That premise was essential to his theory of imperfection. For the minim can only imperfect the semibreve when it is a different species of note, not when it is also a semibreve. Vitry eventually claimed the theory of Muris as part of his own *Ars nova*, but not without holding on to older conceptions that were incompatible with it.

10 The significance of the maxima  to the new style of motets is underlined by a recollection of Jacobus about two events in Paris (*Speculum*, VII. xlviii. 9 and 11). These involved performances of both old- and new-style motets. He describes the first occasion as taking place 'in quadam societate, in qua congregati erant valentes cantores et laici sapientes' ('in a certain society in which were gathered distinguished musicians and non-clerical academics'). 'Sapiens' was a regular term for a master at the university. In this case the masters were non-clerical. When read in context, 'societas' can only mean one of the colleges on the south bank of Paris. The other occasion similarly took place 'in magna sapientium societate'. On both occasions the performances were apparently followed by public discussion. Jacobus tells us about the first occasion that the old motets were generally found to be more pleasing, yet he does not say what listeners appreciated about them. However, he does volunteer an interesting detail about the second: 'quaesitum fuit quali lingua tales uterentur cantores: hebraea, graeca vel latina, vel qua alia, quia non intelligebatur quid diceret' ('the question arose what language the singers used: Hebrew, Greek, or Latin, or some other, for people could not understand what they were saying'). In practical terms that can only have been a comment on the tenors, the question being whether they sang, for example, *Alleluia*, *Kyrie*, or *Virgo*. The complaint surely had to do with the ever-lengthening longas and maximas that separated words and syllables across longer and longer time-spans. The notational inventions of the *moderni* went in both directions, longer and shorter, making for maximum rhythmic contrast between tenor and top voice.

11 The theory was first set forth in the *Conclusiones*. Muris provides the date elsewhere: 'Eodemque anno notitia artis musice proferende et figurande tam mensurabilis quam plane ad omnem modum possibilem discantandi non solum per integra sed usque ad minutissimas fractiones […] nobis claruit […] que tamquam inaudita et ignota ceteris annis antecedentibus quasi sopita in thesauro sapientiae iacuerat' ('In the same year [1321], the knowledge of singing and notating the art of music, both mensural and plain, for every possible manner of discanting, not just in whole notes but down to the minutest fractions […] which in preceding years had lain in the treasure house of wisdom like an unheard and unknown thing, as though fast asleep […] became alight to me'). He evidently did not think of the theory as a novelty. It was old, and had long been hidden, waiting for its potential to be realized. Ulrich Michels, *Die Musiktraktate des Johannes de Muris*, Beihefte zum Archiv für Musikwissenschaft 8 (Wiesbaden, 1970), 2 n. 6.

merit its name unless it was constantly adjusted to changing realities. There is no known copy of *Ars nova* that is identical, or nearly so, with any other. Even the version used by Jacobus was different from any of the ones we know today. All we have is a trail of revisions. Some have spoken of a 'Vitriacan tradition', on the apparent assumption that it represented a coordinated effort on the part of multiple generations of scribes to revise the text.[12] That would not be the default assumption in other textual situations like this.

As for Muris, it had never been his intention to announce the birth of a new art. Such a gesture would be like making the first crack in a layer of ice that was previously safe to skate on. The title of Vitry's treatise created a rupture with a tradition that was still nourishing musical life everywhere. All of a sudden that tradition had become 'old'. For Muris there was no old art or new art. There was only *the* art of mensural notation, the art received from the previous generation, to be passed on to the next with appropriate modifications. One can tell from his writings that he did not like speaking of 'new' even when it came to his own innovations.[13] The system he developed was meant to be a logical extension of teachings already in place, not a break away from them.[14] It was built to last, not to require constant revision in a stream of fresh updates. That is why Muris was just as opposed to the wildest ideas of the *moderni* as was Jacobus.[15] Indeed the two

[12] Only editors would take it upon themselves to completely revise a text, cutting or adding materials, reordering topics, condensing texts into digests, updating technical terms, and so on. When they did, it was often in the context of larger anthologies of treatises that were meant to travel as a unit. (A good example is the Book on Music by Goscalcus, to be discussed below.) Yet Vitry was his own editor, constantly revising previous versions in order to stay relevant. Scribes, on the other hand, were tasked with the making of duplicate versions of text. The finished product was proofread as a rule, the first proofreader being the scribe himself.

[13] Among many examples is the *Conclusiones* of 1321, where Muris mentions his own *gradus* system 'which', he adds, 'is now said to be new'. The clear implication is that this is not a term he preferred. Indeed he repeatedly states that he was only walking in the footsteps of the wise masters of old, treading the paths they had opened, working out what was already implicit in the system but not yet fully worked out. Cf. Christoph Falkenroth, *Die* Musica speculativa *des Johannes de Muris*, Beihefte zum Archiv für Musikwissenschaft 34 (Stuttgart, 1992), lines 1 and 2 on both p. 200 and p. 201. 'Ars nova' is not the appropriate term for the notational developments of the 1310s and 1320s, let alone for the musical fourteenth century. It perpetuates the homogenizing perspective of Jacobus, and obscures the incompatibility between the ideas of Vitry and the theory of Muris. It does an injustice to the distinctive profile of Johannes de Muris. When we try to make the term 'ars nova' apply to both authors at once, the contradictions make it all but indefinable. And it is bound to generate unhelpful questions about whether one or another motet is already, or not yet, 'ars nova' in an idealist sense. Cf. Desmond, *Music and the* Moderni, 19-21 and 120. I suggest that the expression *ars nova* be applied exclusively to the treatise of that name. The 'new art' is whatever Vitry claimed it to be, in any given version of his text, written at any time. It was he, after all, who had invented the slogan in the first place. Muris, on the other hand, relates to Franco as Franco related to Garlandia. Just as we speak of Franconian or Petronian notation, one could appropriately describe the theory that emerged from the upheavals of the 1310s and 1320s as Murian.

[14] A good example is the idea that one note can imperfect another, i.e., that it can reduce that other note by one third of its value and occupy the place of that third. (Thus a single breve ▪ is perfect, 𝅜·, but will be imperfected by a semibreve that comes before or after it: ▪ ♦ or ♦ ▪. This can be rendered in modern notation as 𝅜 𝅗𝅥 or 𝅗𝅥 𝅜.) Franco had spoken of this with respect to longas and breves (◥ ▪ and ▪ ◤), and even used the verb *imperficere* to describe what the breve did to the longa. Franco de Colonia, *Ars cantus mensurabilis*, Corpus scriptorum de musica 18 (s. l., 1974), 32: 'et brevis *imperficit* sequentem longam'. Muris extended this idea to the relations between ▪ and ♦, and between ♦ and 𝅘𝅥, by invoking one of the recurring mottos in Franco's treatise: *idem est iudicium*, 'the same judgement applies' (to every note, that is).

[15] For instance, the following comment of Muris, written in 1319, could have come directly from Jacobus: '[Priores] tempus perfectum pro mensura cantus cuiuslibet posuerunt, scientes quod in arte imperfectum non convenit reperiri, quamvis huius oppositum aliqui moderni, quod abest, se crediderunt invenisse' ('[The *antiqui*] established perfect tempus as the measure of every song, knowing that it is not right that there be something imperfect in art—although some *moderni* have thought, quite wrongly, that they had discovered the opposite'). Ulrich Michels (ed.), *Johannis de Muris: Notitia artis musicae et Compendium musicae practicae*; *Petrus de Sancto Dionysio: Tractatus de musica*, Corpus scriptorum de musica 17 ([Rome], 1972), 66. Barely two years later, in his *Conclusiones* of 1321, Muris makes it clear that past teachings are hardly the final word. He now criticizes the *antiqui* for believing they had already reached the *nec plus ultra* of music—undoubtedly a swipe at Jacobus, who thought just that. There are other such swipes, as when he remarks: 'One must wonder greatly at those who are forced by their fear of superior arguments to let go of the truth' (for all this, see ibid., 97, 101, and 106-7). In *Speculum* VII Jacobus would respond to Muris with multiple swipes of his own.

men started out from positions that were closer to each other than either was to Vitry. In an ideal world they would have been able to work out a compromise, if only for the good of the art they both loved. How it came to a public rift between them is a story I hope to recount elsewhere. For now the point is that Jacobus is a critically important eyewitness, even if he failed to distinguish clearly between the individuals whose work he attacked.

The Philosopher

We could not have asked for an observer of greater acuity and intelligence than Jacobus. Whether he sought and found fame or not, he must be ranked among the towering intellects of his age. He was a man of such stupendous erudition that it is hard to imagine he did not otherwise attract notice in either music or other sciences. Few contemporaries could have rivalled the wide range of his reading, and his seemingly photographic retention of everything he had read.[16] Jacobus had received thorough training in Aristotelian philosophy, and was well-versed in the academic practices of commentary and disputation. This is demonstrated by his treatment of such questions as 'Whether the unison is a consonance', or 'Whether the fourth under a fifth is a consonance' (*Speculum*, II. x and VII. vi). Here he follows well-established rules of academic disputation, for example in listing and evaluating conflicting arguments, and resolving the whole dispute in a *responsio*. Yet the *Speculum* also contains academic writing on more abstract topics. An example is the discussion of the concept of perfection, in Book IV. xxi-xxii, which is perfectly Aristotelian in approach, but owes little to the corresponding discussion in *Metaphysics*, 1021b-1022a. Jacobus was familiar with past and current trends in Aristotelian and Averroist philosophy, and seems to have been interested in just about everything. Only theology was a domain he seems to have been hesitant to enter.

Some of the learning of Jacobus is apparent from his many quotations of well-known texts. Young scholars memorized such quotations from anthologies, the so-called *florilegia*.[17] In *Speculum musicae* they are easily recognized by accompanying phrases like: 'as is evident in *Metaphysics* Book V', or 'as the Philosopher says in the second of *De caelo et mundo*', and so on. Since quotations like these were memorized, they need not attest to years of reading and study. In fact they probably do not, for the quotations tend to be pithy phrases created by the compilers of the *florilegia*, with no literal counterpart in the original text. That makes it easy to tell whether Jacobus used the same anthology as certain other authors.[18]

[16] Jacobus's memory appears to have been less than photographic in the case of one major point made by Boethius, which concerns the division of the whole tone (see the Introduction to this issue). However, the reason, by his own admission, was that he had not paid proper attention during the lectures on Boethius, and therefore had never learned the point in the first place (*Speculum*, II. lvi. 13-14 and 17).

[17] One of those florilegia has been published in a modern edition: Jacqueline Hamesse (ed.), *Les Auctoritates Aristotelis: un florilège médiéval*, Philosophes médiévaux 17 (Leuven, 1974).

[18] The Muris disputation known as Anonymus OP is especially rich in *auctoritates* that are not found, or found in different formulations, in the *Auctoritates Aristotelis*. In the following list I add the names of pre-1350 authors who used the same *auctoritates* in the same formulations: (1) 'item illud est causa quo posito ponitur effectus, et quo remoto removetur et effectus', otherwise found in Peter of Spain and Albertus Magnus; (2) 'idem non est causa oppositorum', attested in Aquinas and Duns Scotus; (3) 'sicut totum ad totum ita pars ad partem', found also in Radulphus Brito and Giraldus Odonis; (4) 'privatio est causa generationis', used also by Henry of Ghent and Aquinas, (5) 'plures causae

Yet *Speculum musicae* is filled also with other references that indicate exceptional erudition. They are inconspicuous, hiding in plain sight. But for Jacobus they were the language he spoke, probably on an everyday basis when he studied and taught at the University of Paris.[19] Usually he is not referring to an author so much as a niche philosophical topic (as it must appear to us), on the apparent assumption that his readers would know immediately what he was speaking of. Lowly music historians like myself can only identify such references with the help of Google Books and other digital resources, and then only if some word or expression looks out of the ordinary. Examples are the Scholastic neologism *circonstancionatus*, which can be traced back to the Paris lectures of John Duns Scotus in 1303,[20] or the concepts of *natura naturans* and *natura naturata*, whose origins around this very time have been the subject of continued scholarly inquiry.[21] Since the treatise of Jacobus has a total word count of about 375,000, we are unlikely to ever discover the full extent of the learning he packed into it.

On the other hand, when Jacobus resolved to write *Speculum musicae*, he was still unfamiliar with advanced music theory.[22] In fact he delayed the project precisely because he had to make a thorough study of the *Musica* of Boethius first.[23] This is the hard work of which he so often complained, especially in Book II. The philosophical backdrop, on the other hand, was the very air he breathed. As I said before, it is hard to imagine that a man of such exceptional accomplishment would have left no academic writings beyond his encyclopedic opus on music.[24] Although Jacobus came to music theory late in life, he must already have made a name for himself writing disputations and commentaries on Aristotle.

causant unum effectum', also in Duns Scotus and Petrus de Atarrabia; (6) 'de extremo ad extremum non contingit pertransire nisi per medium', in Aquinas, Albertus, and Duns Scotus. For the treatise, see Ulrich Michels, 'Der Musiktraktat des Anonymus OP: Ein frühes Theoretiker-Zeugnis der Ars nova', in *Archiv für Musikwissenschaft* 26 (1969), 49-62.

[19] As to his activities as a teacher, Jacobus's knowledge of contemporary philosophy is so vast and so detailed, and his understanding of it so expert, that the regular five-year arts curriculum at the university cannot begin to account for it. He is best viewed as the equal of a distinguished arts master like Jean de Jandun (on whom, see below). The arts curriculum, at this time, was largely devoted to the teaching of Aristotelian philosophy.

[20] *Speculum*, I. xviii. 10. I was able to understand the significance of this matter only with the help of Jeffrey Steel, 'John Duns Scotus's Metaphysics of Goodness: Adventures in 13th-Century Metaethics' (Ph.D. diss., University of South Florida, 2015), esp. 154-82, where the specific term is cited on pp. 159 n. 408 and 180 n. 483.

[21] *Speculum*, I. xxvii. 4. See Olga Weijers, 'Contribution à l'histoire des termes "natura naturans" et "natura naturata" jusqu'à Spinoza', in *Vivarium* 16 (1978), 70-80. The conceptual pair seems to have originated in Averroist commentaries.

[22] I will argue elsewhere that the earliest drafts of the *Speculum* were written around 1320, if not before. (See the introduction to this special issue, which does not, however, lay out the full case.) Jacobus states that the project began and ended with the matter discussed in Book VII. On the basis of Latin idiom and usage one can indeed identify multiple textual layers in Book VII, and date them relative to each other. It is worth noting that the passages in which he describes himself as 'old' occur in what appears for now to be the latest layer.

[23] See *Speculum*, II. lvi. 16: 'qui igitur aliqualiter in consonantiarum proportionibus numeralibus credebam esse sciolus, coepi rursus musicae scientiae, de qua tractare proponebam, quasi novus et diligens esse discipulus, ardenter in Musica studere Boethii quam ceteris, quantum ad consonantiarum numerales proportiones, reperi meliorem' ('I, therefore, who imagined I also knew a smattering of the numerical proportions of the consonances, began again, like a new and eager pupil in the science of music (which I proposed to treat), to study most ardently the *Musica* of Boethius, which I found better as far as the numerical proportions of the consonances were concerned').

[24] I have found no probable candidates for identification in Charles H. Lohr, 'Medieval Latin Aristotle Commentaries, Authors: Jacobus – Johannes Juff', in *Traditio* 26 (1970), 135-216, at 136-49. Two other music treatises, *Tractatus de consonantiis musicalibus* and *Tractatus de intonatione tonorum,* are unquestionably by Jacobus, and possibly also a third, *Compendium de musica*. Yet the stylistic register in these three texts is not academic like that in *Speculum musicae*. For an edition, see Joseph Smits van Waesberghe et al. (eds.), *Jacobus Leodiensis, Tractatus de consonantiis musicalibus; Tractatus de intonatione tonorum; Compendium de musica*, Divitiae musicae artis, ser. A, lib. 9a (Buren, 1988).

What Is a 'Last Name'?

There is another question that needs answering. What, exactly, do we understand by 'last name'? Today it is a matter of law to have one, and only one, legal name. It is prohibited to assert multiple legal names, even without the intention to commit fraud. A different name means a different person, simple as that. But how true was that in Jacobus's time? Did different last names exclude each other?

When it came to having a name and an identity, the applicable law was that of the church, that is, canon law. And the church was concerned with only one name. It was the first name, the Christian name, sealed by the sacrament of baptism, and thus invested with the grace of the divine creator. It was the eternal attribute of the soul. Of course there were bynames, based on profession, place of origin, or father's name. Sometimes these could become inheritable as family names. Even then, however, they were a matter of human convention. Bynames or last names could change as convenience dictated.

The truth of this is illustrated by the self-identification of Jacobus. He took particular care to make his name known to readers, but did so by the indirect means of an acrostic: the first letters of the altogether seven books of *Speculum musicae* spell out the name IACOBUS.[25] Yet he did not reveal his identity out of authorial self-consciousness or pride. Jacobus was not interested in the immortality of his name in history. It was the next world that mattered to him. It was the salvation of his soul that readers could help ensure with their prayers. Not that he asked them directly to pray. But neither was it an eventuality for which he wished to leave them unprepared. If they wanted to pray for him personally, then all they needed for that purpose was his Christian name. That was the name God knew him by. Without it, prayers might well not realize their intention:

> Suscipiant, si placet, opus hoc deliciosi musicalis amatores scientiae et *orare velint Deum pro compilatore*. Fiat, fiat. Si cui autem huius operis *compilatoris nomen* scire placet, librorum septem partialium litteras simul iungat capitales.
>
> May the delightful lovers of the science of music accept this opus, if they please, and *may they pray to God for the author*. Fiat, fiat. And if it pleases one to know *the name of the author* of this work, let him join together the capital letters of the seven partial books.[26]

This explains the apparent contradiction that Jacobus, on the one hand, concealed his name, but on the other, left instructions on how to find it. In this he followed a well-established German literary tradition.[27] Take, for example, the twelfth-century Life of St. Ulrich, whose author expresses the hope, at the end of the book, that readers will pray for him. For that purpose he directs them back to an acrostic on the first page:[28]

[25] The acrostic was discovered by Willibald Gurlitt and made public in Heinrich Besseler, 'Studien zur Musik des Mittelalters: I. Neue Quellen des 14. und beginnenden 15. Jahrhunderts', in *Archiv für Musikwissenschaft* 7 (1925), 167-252, at 181 n. 2.

[26] *Speculum*, I. i. 46-47.

[27] Julius Schwietering gives multiple examples of this literary and devotional device, which he called 'die verhüllende Einkleidung des Autornamens' ('the cloaking of the author's name'), in *Die Demutsformel mittelhochdeutscher Dichter*, Abhandlungen der Akademie der Wissenschaften in Göttingen, philologisch-historische Klasse, n.s., 17 No. 3 (Berlin, 1921), esp. 8-11. Schwietering emphasizes that the device was used almost exclusively in religious poems, and that there is no terminology in Middle High German poetry for the immortality of the name and fame of the poet.

[28] The author is Albertus von Augsburg. See Johann Andreas Schmeller (ed.), *St. Ulrichs Leben, lateinisch beschrieben durch Berno von Reichenau, und um das Jahr 1200 in deutsche Reime gebracht von Albertus* (Munich, 1844), 69, ll. 1574-77, referring back to p. 1, ll. 1-24. (For the red initials, see Munich, Bayerische Staatsbibliothek, Ms. Cgm 94, fol. 27^{r-v}, with the reference to them on fol. 76^{r}.)

Swer wizzen welle sînen namen,	He who wants to know his name,
der sol setzen zesamen,	Must put together,
an dem ersten blate, die buochstaben	On the first leaf, the letters
die die rôten varwe haben	which have the red paint.

In this case the acrostic reads ALBERTUS. Note that it is again the first name that suffices for the purpose.

Two recent discoveries have confirmed that the notion of fixed and inheritable family names was slow to take hold. Margaret Bent discovered in a book inventory compiled at Vicenza in 1457 that the author of *Speculum musicae* was known there as *magister* Jacobus de Ispania. The scribe could only have understood that to mean Spain, and so would anybody today.[29] More recently, Bonnie Blackburn found Jacobus mentioned in an Italian treatise from the early decades of the fifteenth century. This time, however, he had a different toponymic: Jacopo del Leodio, that is, Jacobus of Liège. The names of Jacobus are now two.

We are not obliged to assume that only one of the newly-discovered names must be the 'real' one. Both names were accurate, but in different contexts. If Jacobus was known to live in Liège, it would have made perfect sense everywhere in Europe to call him 'from Liège'. Everywhere, that is, except in Liège itself, where all natives qualified for that toponymic. On the other hand, the name De Ispania would have been quite helpful in the city. Everybody knew what it meant. Not that there were regular visitors coming from Aragon, or Castile, or some other Iberian principality. Liège had no international fairs to attract merchants from the other end of Europe. The chief business in town was the church. In addition to the cathedral there were six collegiate churches and some two dozen monasteries.[30] But the west bank of the city belonged to a large territory and archdeaconate whose Latin name was Hispania or Hisbania, and which is still known today as Hesbaye. The river Meuse on which Liège was situated marked the natural east boundary of that territory. The name would have been useful to distinguish a person who came from 'left of the river' (say, Sint-Truiden, Hasselt, or Tongeren), from another who came from the right bank and beyond (say, Aachen or Maastricht). Elsewhere I have mentioned two examples of two individuals so named: a citizen of Huy who was mentioned, in 1325, as Johannes, *filius* Gilkine de Hesbania, *opidanus Hoyensis*, and a brewer called Johannes de Hesbania who lived in the rue des Pêcheurs, Liège, in 1314.[31] All this is a reminder that a well-travelled person could be known by different toponymics in different places. We have to remain alert to that possibility, lest we miss the trail of the 'real' Jacobus by rejecting all names except one.

The Berkeley Jacobus de Montibus: The Short Version

We need not be alarmed, then, at least not in principle, that there is a third toponymic by which Jacobus may have been known to his contemporaries. It is the name of a music

[29] Bent, *Magister Jacobus de Ispania*, 63-67.

[30] See Catherine Saucier, *A Paradise of Priests: Singing the Civic and Episcopal Hagiography of Medieval Liège* (Rochester, 2014).

[31] Rob C. Wegman, 'Jacobus de Ispania and Liège', in this *Journal* 8 (2016), 253-74. For the examples of Johannes *filius* Gilkine de Hesbania and Johannes de Hesbania, see ibid., 259-60. One of the candidates for identification with Jacobus, the Liège canon Jacobus de Montibus, was a landowner in Wonck in Liégeois Hispania (see the next section).

theorist mentioned in the so-called Berkeley theory manuscript, copied sometime after 1376: Jacobus de Montibus.[32] We find it in the last of the four music treatises contained in that source. The passage in question is problematic, but the reference can be isolated, since it is really the equivalent of a modern footnote:[33]

Numeraciones et divisiones, causa brevitatis, ad Boecium seu ad Iacobum de Montibus, si reperiatur, remitto.	For the sake of brevity I leave the numerations and divisions to Boethius or to Jacobus de Montibus if one can find it [*or:* him].

The name Jacobus de Montibus refers to Mons, the capital of the medieval county of Hainaut. It is some distance away from the two locations we have considered so far: about 130 km (80 miles) west of Liège and Hesbaye (see below, Figure 3). Liège and Mons may now belong to one nation, that is, present-day Belgium, but in the fourteenth century they were the capital cities of two distinct political entities, the county of Hainaut and the prince-bishopric of Liège. A person could be a native of either but not, obviously, of both. Naturally there are scenarios under which a person from Mons could have lived in Liège and be named there after his place of origin. It may also be worth noting that political boundaries such as those between a county and a prince-bishopric need not be the same as those between neighboring dioceses. Most of the time they are not. This will prove important in what follows.

Jacobus is generous in discussing, from personal experience, chant practices specific to Liège, but I have not come across references to Mons or Hainaut in *Speculum musicae*. The possibility that the music theorist Jacobus de Montibus could be him was first raised in 1967, in an article about the Berkeley manuscript by Richard L. Crocker.[34] He noted that the fourth and last Berkeley treatise contains material on the three ancient Greek genera (a topic I will address below), 'with a reference *causa brevitatis ad Boecium seu ad Jacobum de Montibus*'. He went on:

> […] there are not so many authors named 'Jacobus' to whom one would refer in the same breath with Boethius. In fact the only likely candidate seems to be the Jacobus who wrote the *Speculum musicae* and who is usually—but hypothetically—called 'de Liège.' Is 'de montibus' another name for him, or a better one?

Seventeen years later, Oliver Ellsworth published a modern edition and translation of the Berkeley manuscript.[35] He came back to the question of Jacobus de Montibus in the introduction, and mentioned at least one reason for recommending the identification with Jacobus of the *Speculum*. Although the latter had long been called Jacobus of Liège or Jacobus Leodiensis, that name was not then known to be attested in sources predating the twentieth century. It was Heinrich Besseler who coined it in 1927: Jakob von Lüttich—soon to be called Jacobus van Luik in Dutch, and Jacques de Liège in French.[36] Ellsworth conceded that the name

[32] For the sources of this treatise and the book of which it is a part, and for the source abbreviations used in this article, see Appendix 3.

[33] Oliver B. Ellsworth (ed.), *The Berkeley Manuscript: University of California, Music Library, MS. 744 (olim Phillipps 4450)*, Greek and Latin Music Theory (Lincoln, 1984), 226-27.

[34] Richard L. Crocker, 'A New Source for Medieval Music Theory', in *Acta musicologica* 39 (1967), 161-71, at 166.

[35] Ellsworth (ed.), *The Berkeley Manuscript*, 9-10.

[36] Heinrich Besseler, 'Studien zur Musik des Mittelalters: II. Die Motette von Franko von Köln bis Philipp von Vitry', in *Archiv für Musikwissenschaft* 8 (1927), 137-258, at 139 and elsewhere.

> is based on convincing evidence that Besseler and Roger Bragard have produced to show that he belonged to the school at Liège, [but it] is purely a product of twentieth-century scholarship […] One might therefore adopt [the name Jacobus de Montibus] on a provisional basis and certainly assign it greater probability than the inauthentic (although logically defensible) twentieth-century fabrication that has been used until now.

So that was the reason: the toponymic De Montibus has the advantage at least of being the real name of a real music theorist, attested in a real fourteenth-century source. The response of those who reviewed the Berkeley edition was lukewarm at best. Of the five reviews known to me, only that by Christian Meyer refers in passing to 'a certain Jacobus de Montibus, who seems potentially identifiable with Jacques de Liège.'[37] The other four make no mention of the name at all.[38]

And yet, there was one scholar who was completely persuaded by the argument: Michel Huglo. In publication after publication he reminded the field that the 'spurious name' Jacques de Liège should be replaced by the 'true' name Jacobus de Montibus.[39] His conviction in this regard seems only to have strengthened over the years. What he phrased as 'ought to be replaced' in 1999 became 'must be rectified' in 2005:

> [1999] Let us note that the name Jacques de Liège, coined by Roger Bragard with the 'collusion' of Joseph Smits van Waesberghe, *ought to be replaced* from now on by that of Jacques de Mons (Jacobus de Montibus).[40]
>
> [2005] Let us note in passing that the [toponymic] 'de Liège' given to the author of the *Speculum musicae* in seven books (each beginning with one of the seven letters of the name Jacobus), *must be rectified* from now on by mentioning his place of birth: Mons in [Hainaut], whence Jacobus de Montibus, as in the Anonymous of Berkeley.[41]

Very few scholars acted on Huglo's imperative. He had presented no new evidence, and did not expand on the hypothesis presented by Crocker and Ellsworth. I call this 'the short version' of the tale of the Berkeley Jacobus de Montibus. There is a longer version occasioned by a perplexing circumstance. The fourth Berkeley treatise is nothing short of a disaster. Within the space of a mere 1,000 words, it manages to be consistently chaotic and confused, even if it is redeemed by attractive illustrations of contemporary

[37] Christian Meyer in *Revue de Musicologie* 73 (1987), 125-26, at 125: 'Un certain Jacobus de Montibus qui semble pouvoir être identifié avec Jacques de Liège.'

[38] Calvin M. Bower in *Journal of Music Theory* 31 (1987), 318-24; Martin Staehelin in *Die Musikforschung* 40 (1987), 187; Don Harrán in *Notes*, Ser. 2, 44 (1987), 48-50; and Gareth R. K. Curtis in *Early Music* 13 (1985), 283-84.

[39] In addition to the publications cited in the next two notes, see Michel Huglo, 'Bibliographie des éditions et études relatives à la théorie musicale du Moyen Âge (1972-1987)', in *Acta musicologica* 60 (1988), 229-72, at 255; idem, 'L'enseignement de la musique dans les universités médiévales', in *Atti del XIV congresso della Società internazionale di musicologia*, 3 vols. (Turin, 1990), vol. 1, 30-37, at 32-33; idem, review of Jeremy Yudkin (ed.), *De musica mensurata*, in *Speculum* 66 (1991), 606-8, at 607; idem, 'La Messe de Tournai et la Messe de Toulouse', in *Aspects de la musique liturgique au Moyen Âge*, ed. Christian Meyer (Paris, 1991), 221-28, at 223; idem, 'La place du *Tractatus de Musica* dans l'histoire de la théorie musicale du XIII^e^ siècle – étude codicologique', in *Jérôme de Moravie: un théoricien de la musique dans le milieu intellectuel parisien du XIII^e^ siècle*, ed. Christian Meyer (Paris, 1992), 33-42, at 39; idem, review of Jeremy Yudkin (ed.), *De musica mensurata*, in *Scriptorium* 46 (1992), 146-47, at 147; idem, 'L'étude des diagrammes d'harmonique de Calcidius au Moyen Âge', in *Revue de musicologie* 91 (2005), 305-19, at 315 n. 35.

[40] 'Remarquons que le nom de Jacques de Liège, forgé par Roger Bragard avec la "complicité" de Joseph Smits van Waesberghe, devrait être désormais remplacé par celui de Jacques de Mons (Jacobus de Montibus), suivant le traité de Berkeley.' Michel Huglo, 'Recherches sur la personne et l'œuvre de Francon', in *Acta musicologica* 71 (1999), 1-18, at 2 n. 11.

[41] 'Remarquons au passage que le patronyme "de Liège" donné à l'auteur du *Spéculum musicae* en sept livres (débutant chacun par l'une des sept lettres du prénom Jacobus) doit être désormais rectifié par la mention de sa ville natale: Mons en Brabant, d'où Jacobus de Montibus, comme dans l'Anonyme de Berkeley.' Michel Huglo, *La théorie de la musique antique et médiévale* (Burlington, 2005), Addenda et corrigenda, 11.

string instruments and other figures. It is hard to believe that the author had any training in the advanced music theory he proposed to treat. Multiple statements are inscrutable, and hard to connect with anything he wrote before or after. I will come back to these problems later. For now, let us add another important dimension to the story.

A decisive breakthrough in that story came with an article by Karen Desmond entitled 'New Light on Jacobus, Author of *Speculum musicae*', published in 2000.[42] Desmond had come across an intriguing entry in an early twentieth-century anthology of summaries of decrees issued by Pope John XXII.[43] The entry was dated 1316. It concerned a canonry in the church of Saint-Paul, Liège, which the pope awarded to a certain Jacobus de Montibus in Anonia, that is to say, Jacobus of Mons in Hainaut.

The location of the benefice, Liège, was encouraging, for an individual who could conceivably be identical with the *Speculum* Jacobus. No less encouraging was the year, 1316. For although *Speculum musicae* took a long time to complete, it had started out as a polemic response to developments that started around this very time. Most encouraging, finally, was the name Jacobus de Montibus. That name could now apply to the author of *Speculum musicae* in two ways: as the music theorist mentioned in the Berkeley treatise, and as the canon documented in Liège and Papal Avignon. The clue positively demanded following up.

Desmond visited the pertinent archives in Liège, and returned with a trove of documents about the canon Jacobus de Montibus—or 'Jakeme de Mons', as he was known in the vernacular. Although there are major lacunas in the records, the overall picture was clear enough. This man had been resident in Liège from his arrival in June 1322, when the relevant canonry became vacant, to at least 1335, the last year in which he is recorded as being alive. By that year he was evidently setting up provisions for his last will, having to do specifically with prayers and commemorations. Only the previous year, 1334, he had purchased lands near the town of Wonck, in the territory of Hesbaye or Hispania. The income of those lands was earmarked, at least in part, for thirty-one vigil masses at the altar of St. Agnes. It may also have paid for his annual obit on 20 February. None of this suggests that he necessarily passed away soon after this. One could not write one's testament soon enough, to prevent that most horrible fate of the *mors improvisa* or unforeseen death—no reckoning made, but sent to one's account with all imperfections on one's head. It is not until nine years later, in 1344, that we know for certain he was no longer alive.

Of course there is nothing to tell us that the Liège canon Jacobus de Montibus was a distinguished music theorist, just as there is nothing to suggest the opposite, that he had no knowledge of music at all. It was not the business of papal provisions to remark upon the intellectual specialties of candidates for advancement. Nor could it have been of particular relevance to the administration of St. Paul's, Liège. Everybody knew him anyhow.

Still, there are several intriguing connections. As of now we are dealing with three persons named Jacobus. Let us label them A, B, and C: the Author Jacobus, the Berkeley

[42] Karen Desmond, 'New Light on Jacobus, Author of *Speculum musicae*', in *Plainsong and Medieval Music* 9 (2000), 19-40. The remainder of this section offers a summary of Desmond's discoveries, and does not reflect fresh research on my part.

[43] Arnold Fayen (ed.), *Lettres de Jean XXII (1316-1324): textes et analyses*, 2 vols., Analecta Vaticano-Belgica 2 (Rome, 1908-12), vol. 1, 52, No. 176.

Jacobus de Montibus, and the Canon Jacobus de Montibus in Liège. The three men have several things in common, but only in pairs. For example, A and B were music theorists, but we do not know that for certain about C. Likewise, A and C were associated with Liège, but we do not know where B lived. Again, B and C were called 'from Mons', but A gave us no toponymic or byname when he identified himself. Finally, A had been active at the University of Paris, which is true of C as well (see the next section), yet we know nothing about the education of B. In each of these cases, the third Jacobus is a blank, neither positively agreeing nor positively conflicting with the other two. Each is connected to the others by at least one intermediate line.

In recent years I have further explored the life of the Liège canon Jacobus de Montibus. It looks like a case could be made for his identity with the *Speculum* Jacobus. Not that there is a smoking gun. But the canon Jacobus de Montibus matches the author of the *Speculum* in so many specific ways that it would be hard to speculate on the existence of another Jacobus, as yet undocumented, who might prove to be an even closer match. The identification solves problems and explains apparent contradictions that would otherwise seem almost impossible to reconcile. Although we are concerned principally with the music theorist mentioned in the Berkeley manuscript, it may be useful to present at least the raw facts of the case, as I was fortunate enough to discover them.

Excursion: The Canon Jacobus de Montibus

It was the University of Paris that recommended Jacobus de Montibus for a canonry.[44] He was one of twenty-seven candidates on whose behalf the university petitioned the pope, requesting him to award lucrative benefices to each. The direct context for the petition was the Great Famine of 1315-16. Although this calamity is now largely screened from our view by the Black Death of 1348, three decades later, it ranks as the worst famine in recorded European history. It turned Paris into a place of starvation and death, with everyday scenes recalling footage of the worst humanitarian crises of our time. All residents who could afford to move out of the city left for the country. This had a devastating effect on the university, whose arts faculty all but collapsed in the summer of 1316.[45] Things got so bad that of the 500 arts masters who were resident at the faculty at normal times, only fifty now remained.[46] It was going to be hard to keep even these

[44] William J. Courtenay (ed.), Rotuli Parisienses*: Supplications to the Pope from the University of Paris*, Education and Society in the Middle Ages and Renaissance 44 (Leiden, 2002), 31-38. First noted by Giles Rico, 'Music in the Arts Faculty of Paris in the Thirteenth and Early Fourteenth Centuries' (Ph.D. diss., University of Oxford, 2005), 32-33.

[45] Heinrich Denifle and Émile Chatelain (eds.), *Chartularium Universitatis parisiensis*, 4 vols. (Paris, 1889-97), vol. 2, 183-84, doc. 728a: 'Universitas tota detrimentum patiatur, facultas tamen artium lapsa est inter omnes […] nisi in brevi remedium apponatur, facultas artium in nichilum redigetur. Cum temporibus retroactis fuerint quingenti magistri in artibus actu regentes, nunc autem sunt quinquaginta vel etiam pauciores' ('the whole university is suffering deterioration, for among all the faculties, that of the Arts has collapsed […] if no remedy is applied shortly, the Arts faculty will be reduced to nothing. When formerly there were 500 regent masters in arts, now there are only 50, or even fewer').

[46] For teenage students in the arts there was no option but to leave Paris. Perhaps this may explain why Johannes de Muris, while still a student, resided 'for the time being' in the Norman town of Évreux in the year 1318 (see Paris, Bibliothèque nationale, Ms. lat. 7281, fol. 159^{v}). William Chester Jordan reports in *The Great Famine: Northern Europe in the Early Fourteenth Century* (Princeton, 1996), 120, that the Norman countryside 'seems to have been spared the worst consequences of the harvest shortfalls'; Paris was not (ibid., 142). Muris speaks of Évreux as the place where he wanted to 'find' (that is, date) the entry of the sun into Aries while contemplating the motions of the planets. Dating the sun's entry into Aries was a difficult thing to do since the event could not be observed with the naked eye. The method, as Muris would have learned it from the twelfth-century *Book of Nine Judges*, was to calculate the date from the positions of the other planets in the zodiac. That is why Muris says that he contemplated the motions of the plan-

masters in Paris, unless efforts were made to improve their living conditions and secure additional income for them.

The petition to the pope represented one of those efforts. The twenty-seven masters were among the best and brightest at Paris, whose departure at this time would have been a singularly painful loss. Among them we find Jean de Jandun, the leading philosopher of the 1310s, known as the 'Prince of Averroists', and Marsilius of Padua, with whom Jandun was believed to have written the controversial political treatise *Defensor pacis*.[47] Both authors were excommunicated after its appearance in 1324. The list also included the highly distinguished philosopher-theologians Radulphus Brito and Thomas Wylton, and beyond that, five Parisian theologians who would play a key role in the controversy of the Beatific Vision of 1334: Jean de Blangy, Simon de Maneslies, Guillaume de Renault, Olivier Saladin, and Guillaume Bernardi.[48] This is not to mention multiple candidates who would be active later in life as senior figures serving church, court, parliament, secular administration, and university.

That the Liège canon Jacobus de Montibus was a man of intellectual distinction is evident from the 1316 petition alone. The university would not have been at pains to keep mere arts students, who were in their late teens and had no license to teach. The truly indispensable members of the university were well-respected masters in the arts and theology. Yet his intellectual distinction is apparent also from two manuscripts that carry his mark of ownership. They survive as a single fascicle in Berlin, and contain two works on Scholastic philosophy. One is a treatise on the *Modi significandi* which Jacobus de Montibus ascribed to Petrus de Dacia (that is, of Denmark). The other is a commentary on Aristotle's *Topica* by Boethius de Dacia.[49]

It is not without significance that this thirteenth-century Boethius had been, along with Siger of Brabant, the prime target of the Paris Condemnation of 1277. This was a prohibition of 219 theses that had been aired in lectures and disputations in the Arts

ets. For the method of determining the sun's entry into Aries, see *Liber nouem iudicum in judicijs astrorum* (Venice, 1509), fols. 90^{v}-91^{v}, unnumbered chapter titled 'De qualitate aeris et temporum'. There is no reason why Muris should have travelled to Évreux to do this. Location made no difference: he could just as easily have done it in Paris. Yet he was already temporarily 'degens' in Évreux, which could mean spending time, biding one's time, whiling away the time, or even just waiting, surviving, or toughing it out. (The motet *Se grace/Cum venerint/Ite missa est*, whose motetus appears to be associated with the famine, calls for charity towards the 'miseri degentes', i.e., the wretched survivors; cf. Tournai, Chapitre de la cathédrale, Ms. A27, fol. 33^{v}.) The date of the observation is 13 March 1318, *not* 1319 n. st. The entry of the sun in Aries marked the beginnning of the new astronomical year, which means that scholars dated the event after the year in which it happened, which Muris states was 1318.

47 Marsilius of Padua, *The Defender of Peace*, trans. Alan Gewirth (New York, 1956). Averroism is the name of a trend in Scholastic philosophy influenced by the Aristotle commentaries of Arab philosopher Ibn Rushd, known as Averroes, even when these were at variance with the teachings of the church. Arts masters were quite willing to entertain his interpretations, but only for the sake of argument, without meaning to encroach on the territory of the faculty of theology. The condemnation issued by bishop Étienne Tempier of Paris in 1277 (below), reflected an effort on the part of theologians to suppress this trend. The action proved fruitless in the long run: by the 1310s, Averroism was alive and kicking in Paris.

48 Marc Dykmans (ed.), *Les sermons de Jean XXII sur la vision béatifique*, Miscellanea historiae pontificiae 34 (Rome, 1973), 186.

49 These manuscripts now form the final fascicles of Berlin, Staatsbibliothek Preussischer Kulturbesitz, Ms. lat. fol. 624, fols. 191^{r}-214^{v} and 215^{r}-230^{v} (new foliation). For a discussion of the fascicles owned by Jacobus de Montibus, see Martin Grabmann, *Kommentare zur aristotelischen Logik aus dem 12. und 13. Jahrhundert im Ms lat. fol. 624 der Preussischen Staatsbibliothek in Berlin*, Sitzungsberichte der Preussischen Akademie der Wissenschaften, Phil.-hist. Klasse, 18 (Berlin, 1938), 1-28, at 24-25. There is an image of fol. 203^{r} in Nicolaus Georgius Green-Pedersen (ed.), *Boethii Daci Opera: Topica – Opuscula*, Corpus philosophorum Danicorum medii aevi (Copenhagen, 1976), vol. 6, pt. 2, pl. 1, facing p. xvi. The manuscript comes from the library of the Abbey of St. Victor in Paris. Its contents (including the fascicles owned by Jacobus de Montibus) are described in the 1514 catalog compiled by Claude de Grandrue; see Paris, Bibliothèque nationale, Ms. lat. 14767, fol. 230^{r}.

Faculty but were now censured as contrary to the Catholic faith. As it happens, many of these theses go back to the very *Topica* commentary of which Jacobus de Montibus owned a copy.[50] There is a likely connection here with the philosopher and theologian Godefroid de Fontaines, born in Liège, canon of the city's cathedral (then St. Lambert's), and revered as the *Doctor venerandus*. Fontaines taught at the Collège de Sorbonne between about 1275 and 1309. He would have been the obvious master for a bright young student from Liège to work with. (Jacobus de Montibus must have been a student at Paris about 1285-95; see below.) In the wake of the condemnation of 1277, Godefroid was the most prominent defender of Siger of Brabant and Boethius de Dacia. Among the manuscripts in his library, there is one that contains three treatises by Siger, as well as his own abridgement of the *Topica* commentary by the Denmark Boethius: Paris, Bibliothèque nationale, Ms. lat. 16297.[51] It is indicative of his interest in the ideas condemned in 1277 that he copied these and related treatises in his own hand. It is not hard to imagine that he would have passed on his interest to students.

All this, of course, is about Jacobus de Montibus, canon of St. Paul's, not necessarily about the Jacobus who wrote *Speculum musicae*. Yet it does resonate with the latter's interest in the 1277 condemnation, of which the treatise shows clear evidence.[52] In fact, Jacobus can be linked to Godefroid even more closely than the Liège canon. The link has to do with one of the articles of condemnation, number 200. It censures the proposition that if there were no rational soul to measure and count motion, there would be no such thing as time. Time, in other words, takes on existence and assumes reality only in the act of measuring; otherwise there is no such thing. In the condemnation this 'error' was formulated in terms crude enough to make it sound erroneous: 'That age and time are nothing in terms of real things, but exist only in perception' (above, n. 52). Jacobus put it quite differently: 'if there were no soul to observe and number the before-and-after of motion [...] there would be no time.' His words turn out to be a literal

[50] Roland Hissette, *Enquête sur les 219 articles condamnés à Paris le 7 mars 1277*, Philosophes médiévaux 22 (Leuven, 1977).

[51] See P. Glorieux, 'Un recueil scolaire de Godefroid de Fontaines (Paris, Nat. lat. 16297)', in *Recherches de théologie ancienne et médiévale* 3 (1931), 37-53, and Bruce Braswell, 'Godrey of Fontaines' Abridgement of Boetius of Dacia's "Quaestiones supra librum Topicorum Aristotelis"', in *Medieval Studies* 26 (1964), 301-14. However, a comparison of variants (including the edition of Green-Pedersen (ed.), *Boethii Daci Opera: Topica*) indicates that the *Topica* commentary owned by Jacobus de Montibus and the abridgement made by Godefroid belong to different textual branches of transmission.

[52] Jacobus cites and shows awareness of at least six articles condemned in Paris in 1277; I follow the numbering in *Chartularium Universitatis parisiensis*, vol. 1, 543-58. (1) Article 32, which holds that there is a single intellect shared by all humans (Averroës): 'Quod intellectus est unus numero omnium'. Cited verbatim, and unambiguously rejected as erroneous, in *Speculum*, IV. xxii. 12. (2) Article 40: that there is no more excellent way to live than devote oneself wholly to philosophy ('Quod non est excellentior status quam *vacare* philosophie'). In the General Prologue, *Speculum*, I. i. 30, Jacobus proposes to do just that by writing a work on philosophy (in this case, speculative music theory), having the leisure to prioritize this over all other activities: 'ut, etiam cum *vacat*, aliquam operam darem philosophiae'. The prologue is in any case a vigorous defense of philosophy, closely paralleled by similar prologues in Aristotle commentaries from the 1310s by such authors as Jean de Jandun (*De anima*) and Radulphus Brito (*Priora analytica*). (3) Article 124: that each individual soul has the same degree of perfection as the genus soul, of which it is a species. In *Speculum*, IV. xxii. 15, Jacobus cites the objection to this article, which is that the soul of Christ would not then be more noble than that of Judas ('Error, quia sic anima Christi non esset nobilior anima Jude'). (4) Article 154: that philosophers alone are the wise men of this world ('Quod sapientes mundi sunt philosophi tantum'). Jacobus comes close to subscribing to this with a quotation from Boethius, *Arithmetica*, in *Speculum*, I. viii. 6. (5) Article 178: that death is the last of all terrifying things: 'Quod finis terribilium est mors'. Cited after Aristotle, *Nicomachean Ethics* in *Speculum* I. xiv. 7, but without the qualification that the terrors of hell are worse, failing which it was condemned as heretical in 1277. (6) Article 200: 'Quod evum et tempus nichil sunt in re, sed solum in apprehensione'. See the main text directly following this footnote. On this topic, see also Frank Hentschel, *Sinnlichkeit und Vernunft in der mittelalterlichen Musiktheorie*, Beihefte zum Archiv für Musikwissenschaft 47 (Stuttgart, 2000), 159-63.

borrowing from an anonymous commentary on the *Physics* of Aristotle that survives uniquely in the manuscript copied by Godefroid. This text is steeped in the thought of Siger of Brabant, and has even been thought to be a work of his (shared text underlined):[53]

[anon.] Et sic,	[Jacobus] Unde fit ut,
si non esset anima	si non esset anima attendens et
numerans prius et posterius in motu,	numerans prius et posterius in motu,
	quae habent rationem praeteriti et futuri,
	et si esset tempus fundamentaliter in re,
non esset tempus.	non esset tamen tempus
	quantum ad suum esse, completivum et
	formale, ut distinguitur a motu.

Although the thesis had been discussed by multiple authors, I have not so far been able to find this formulation in sources other than *Speculum musicae* and the anonymous commentary.[54] One is thus led to posit a direct connection between Jacobus and Godefroid, one that may well have left its mark in other textual dependencies as yet to be uncovered.

There is one more thing we can say about the Jacobus of the *Speculum*. There is a good probability that he, too, was associated with the Collège de Sorbonne, like Godefroid de Fontaines and, at a later point, Johannes de Muris. In *Speculum*, II. lxxxvij. 12, he expresses his disapproval of a music theorist who had posited that the minor sixth has the ratio $^{768}/_{486}$. He had found the claim 'in quodam […] tractatu' ('in a certain treatise') but does not identify the author. From the quote that follows it is apparent that he was referring to the *Tractatus de musica* of Hieronymus of Moravia.[55] This treatise is known from only one copy, one that was bequeathed to the Collège de Sorbonne by Pierre de Limoges in 1306. Since Hieronymus (who worked practically next-door to the college) had compiled his music treatise specifically for the use of friars in the Dominican order, it may not have circulated widely outside it. The Sorbonne College copy is likely the one that Jacobus consulted. The evidence is circumstantial, yet the particular circumstances to which it testifies are so narrowly defined in place and time that the possibility of coincidence must be less of a concern than it is with circumstantial evidence in general. It is a small world when both Siger of Brabant and Jacobus de Montibus were canons of St. Paul's, Liège (see below), when Godefroid was a canon of Liège Cathedral, when there is a demonstrable shared interest in the condemnation of 1277, and when

[53] Albert Zimmermann, *Ein Kommentar zur Physik des Aristoteles aus der Pariser Artistenfakultät um 1273*, Quellen und Studien zur Geschichte der Philosophie, 11 (Berlin, 1968), 87, ll. 30-33; *Speculum*, I. xxv. 3. This was not an off-hand quotation. It is an expanded version of the more basic 'si non esset anima, non esset tempus' which St. Thomas Aquinas attributed to Aristotle; see his commentary on the Sentences, lib. 1, dist. 19, q. 2, art. 1, concl. Jacobus further expanded it with subclauses that demonstrate his knowledge of the question. See the analysis and interpretation of the relevant chapter in Della Seta, '*Utrum musica*', 180-94, and 182-84. Note that the article of condemnation makes no mention of the act of counting, thereby implying, wrongly, that the existence even of measured time had been denied.

[54] To determine how exclusive the formulation may have been to the *Speculum* and the text copied by Godefroid, I consulted three anonymous Physics commentaries that likewise bear the imprint of Siger's thought; cf. Zimmermann, *Ein Kommentar*, xxx-xxxix. The commentaries are Munich, Bayerische Staatsbibliothek, Ms. clm. 9559, fols. 18^{r}-44^{r}, Paris, Bibliothèque nationale, Ms. 14698, fols. 83^{r}-129A^{r}, and Vatican Library, Ms. vat. lat. 6758, fols. 1^{r}-43^{v}. I found the topic discussed in only one of these commentaries, the one in the Vatican manuscript, where the formulation is 'quod extra animam non existit tempus in actu per se' (unnumbered folio).

[55] Hieronymus de Moravia, *Tractatus de musica*, ed. Christian Meyer and Guy Lobrichon, Corpus Christianorum, Continuatio Mediaevalis, 250 (Turnhout, 2012), 137 ll. 1373-75.

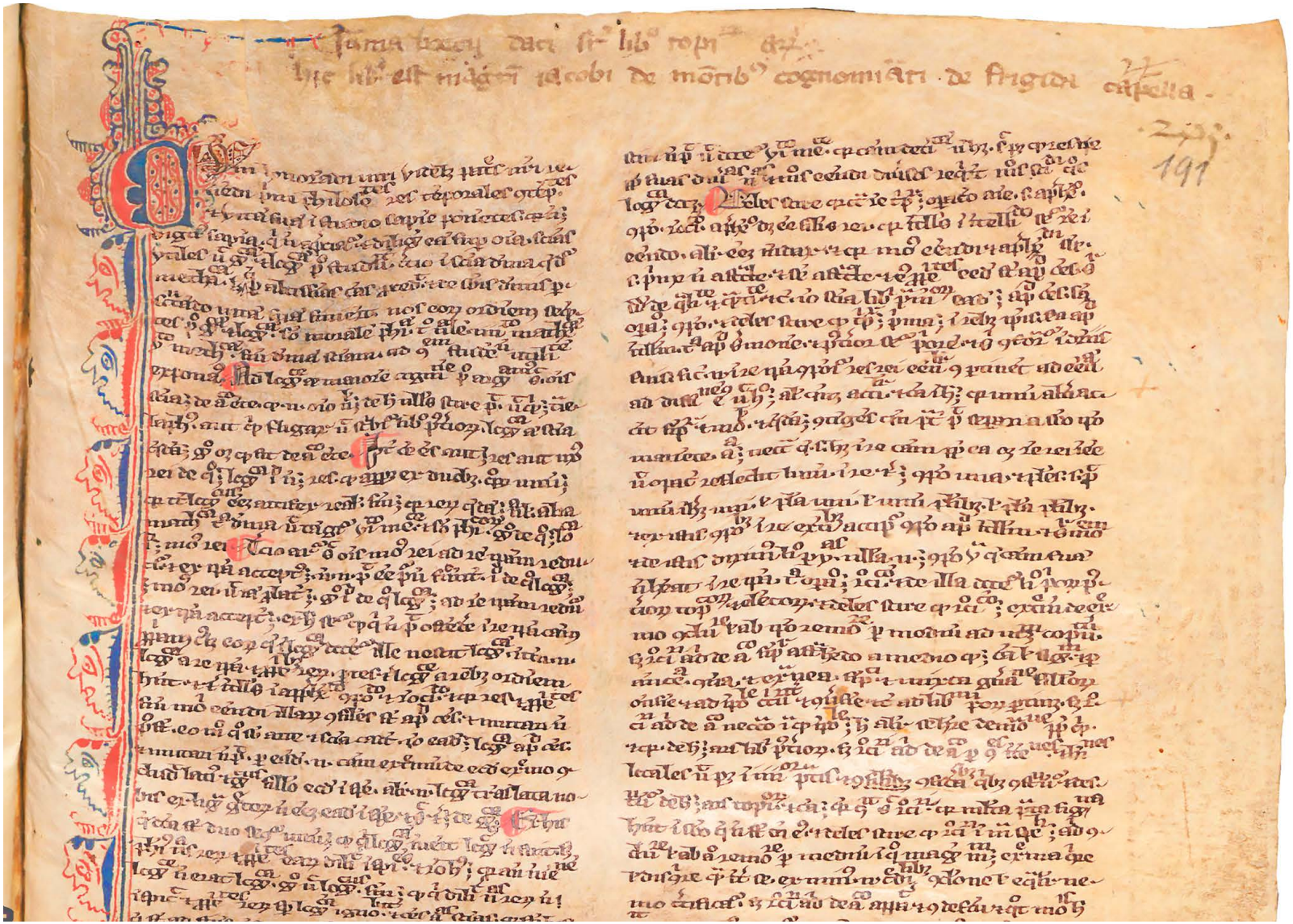
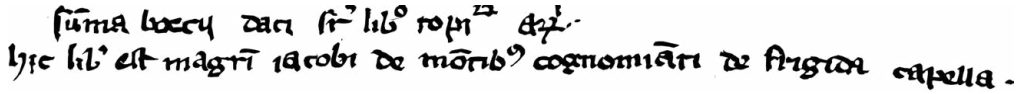


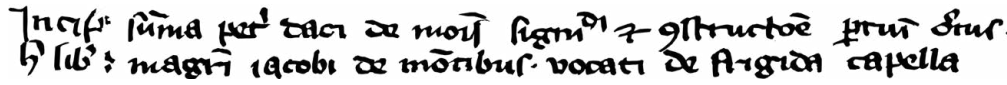
Figure 1. Berlin, Staatsbibliothek, Ms. lat. fol. 624, fols. 191r, inscription of ownership by Jacobus de Montibus

the Collège de Sorbonne emerges as the site that best explains the connections between Godefroid and the apparent Janus figure who may be Jacobus de Montibus and Jacobus, the author of *Speculum musicae*, in one.[56]

Jacobus de Montibus inscribed his name in both fascicles (Figures 1 and 2; Appendix 1). In so doing he gave us an additional toponymic—the fourth of the possible names of Jacobus. He styled himself '*Magister* Jacobus de Montibus *cognominatus* (or *vocatus*) De Frigida capella'. A *cognomen* in the classical sense is the third name, and that is what we find in the Berlin source. The name 'De Frigida capella' refers to Froidchapelle, a hamlet about 50 km (30 miles) southeast of Mons, still within the county of Hainaut. So the qualifier 'in Anonia' given to the canon Jacobus in documents from Liège and the Avignon Papacy was certainly accurate. His birth in Froidchapelle may solve one major problem about his identification with the Jacobus who wrote *Speculum musicae*: why should a man from Hainaut, a county that belonged almost wholly to the diocese of Cambrai, have received a benefice in the diocese of Liège?



a. Fol. 191r: 'Summa Boecij Daci super librum Topicorum Aristotelis. Hic liber est magistri Iacobi de Montibus cognominati De Frigida capella'



b. Fol. 215r: 'Incipit Summa Petri Daci De modis significandi et constructione partium orationis. Hic liber est magistri Iacobi de Montibus vocati De Frigida capella'

Figure 2. The inscriptions of ownership of Jacobus de Montibus, *alias* de Frigida capella, in Berlin, Staatsbibliothek, Ms. lat. fol. 624, fols. 191r and 215r

The answer is that Froidchapelle was situated in the one small corner of Hainaut that happened to fall under the diocese of Liège (Figure 3).[57] The city of Liège was thus the logical choice when Jacobus de Montibus was considered for a benefice in 1316. Moreover, since he belonged administratively to the diocese of Liège rather than Cambrai, he could only have to gone to school in Liège, which had long been an intellectual powerhouse, and a rich supplier of talent to Paris.[58] (As coincidence would have it, Siger of Brabant, whom I mentioned a moment ago, had held a canonry in the same church of St. Paul's as Jacobus de Montibus.)

[56] See also below, Appendix 2, for the connection between the canon Jacobus de Montibus and the Sorbonne College theologian Galterus de Auxiaco.

[57] C. B. de Ridder, *Les diocèses de Belgique avant 1559* […] *Première partie: Diocèse de Liège* (Leuven, 1866), 181. In Froidchapelle, the chant tradition that children grew up with was the Use of Liège: in 1608, the missal used in the local parish church was reported to follow that use; see M. T. Bernier, 'Le besogné de Froid-Chapelle en 1608, précédé d'une notice sur ce village', in *Documents et rapports de la Société paléontologique et archéologique de l'arrondissement judiciare de Charleroi* 14 (1886), 335-438, at 365: 'Deux missels l'un à l'usage de Liège et l'autre à l'usage de Rome'. All this helps explain why it made sense for Jacobus de Montibus to name himself after Mons (and sometimes Froidchapelle) and yet be active as a canon in Liège.

[58] Christine Renardy, *Le monde des maîtres universitaires du diocèse de Liège, 1140-1350: Recherches sur sa composition et ses activités*, Bibliothèque de la Faculté de Philosophie et Lettres de l'Université de Liège 227 (Paris, 1979).

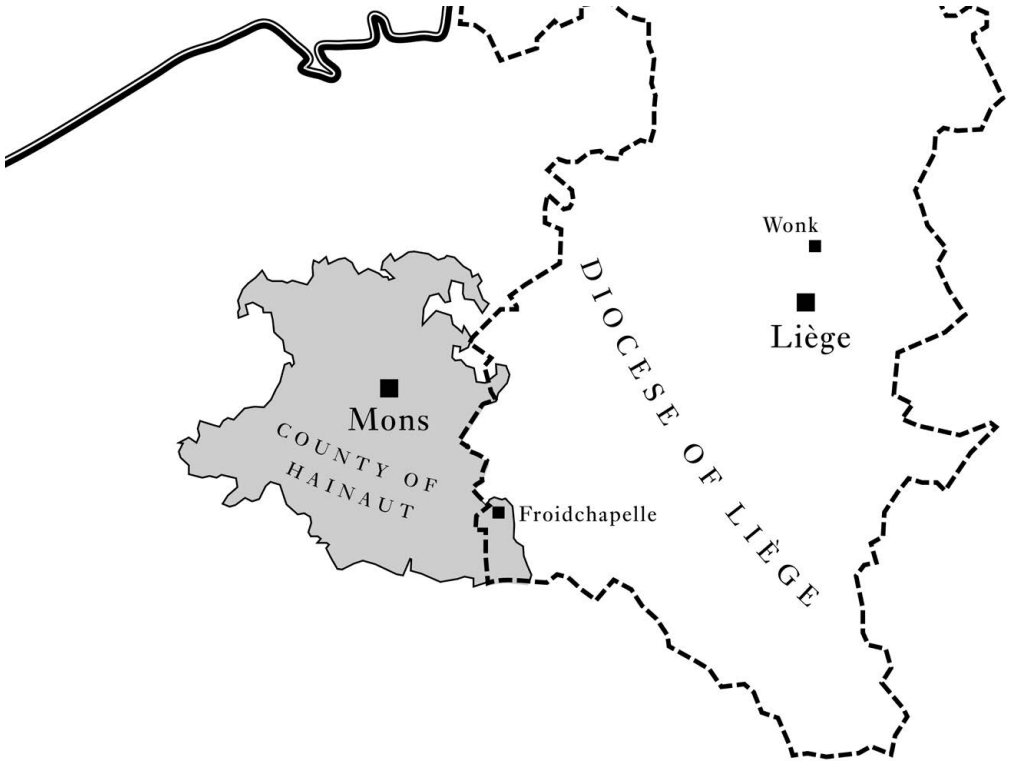


Figure 3. Map of medieval Hainaut and the diocese of Liège

Jacobus de Montibus and his family were indeed known in Mons as De Froicapelle.[59] His father Hues de Froicapelle, an independently wealthy *rentier*, is mentioned as *échevin* of the city of Mons in multiple documents from 1269 until his death in 1314. His name also appears in connection with the life annuities he set up for his daughters Agniés, Jehanne, and Mariien, as well as for his only son, *maistre* Jakemon de Froicapelle (Figure 4). The latter is mentioned as 'le fil dou Huon de Froicapelle' in accounts from 1310-11, but from 1316 on he appears with his academic title and full name as it was known in Mons. (He could not usefully be identified in this city as 'Jakemon de Mons'.) The last known payment of his life annuity was recorded in 1335. That does not mean he died in that year. The document in question is the second of two lone annual accounts that happen to survive in Series P of the Mons town archives. There is no way of telling how many years after this he kept collecting the annual payments of his annuity:[60]

[59] Christiane Piérard, *Les plus anciens comptes de la ville de Mons (1279-1356)*, 2 vols. (Brussels, 1973), vol. 2, 27-28 for the full index of names; Jacques Monfrin, 'Chirographes de Mons (1269-1427)', in idem, *Études de philologie romane*, Publications romanes et françaises 230 (Geneva, 2001), 175-90. The pattern is a familiar one: countless families held property in the village of origin and continued to draw income from it, but did business in the city, became resident citizens, and took on public responsibilities. In Figure 4, Jakemon's sister Agniès receives payment a few lines further down: 'A Agnies qui fu fille Huon de Froicapielle, nonne de Bethleem' (line 7). She was a nun in the Abbey of Bélian or Bethleem near Mons, and was mentioned as abbess in 1351. See Gonzalès Decamps, 'L'abbaye de Bethléem ou de Bélian à Mesvin-lez-Mons, 1244-1796', *Annales du Cercle archéologique de Mons* 32 (1903), 16-160G, at 32, 75, and 153-57.

[60] Piérard, *Les plus anciens comptes de la ville de Mons*, vol. 1, 67, 116, 596, and 604.

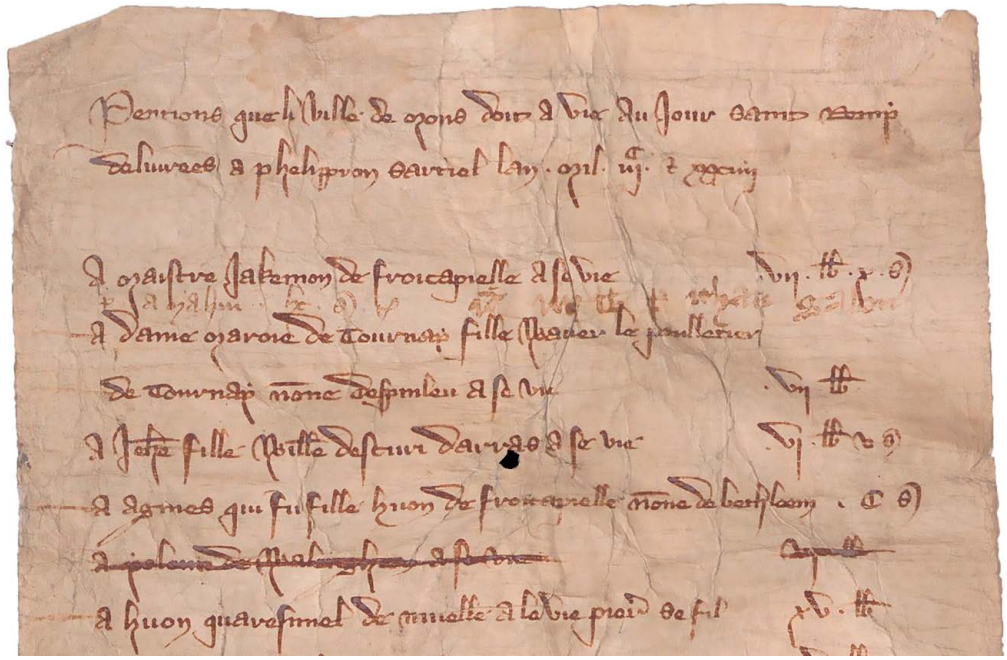


Figure 4. Payment of life annuity to maistre Jakemon de Froicapielle, on 1 October 1334 (line 3). Archives de l'État à Mons, Archives de la ville de Mons (section ancienne), No. 1422/1 (published with permission)

Series M: accounts of the municipal treasury

[1 May and 24 June 1312] Item, rechiut a Jean Loys […] pour le moitiet de 39 s. tour. ke li ville doit a tous jours au fil Huon de Froicapelle, au premier jour de may […] et pour le moitiet de 10 lb. ke li ville doit a tous jours au fil dou dit Huon de Froicapelle, au jour Saint Jehan Baptiste.	Item, received from Jean Loys […] for one half of 39 sous tournois which the city owes for always [that is, for the rest of his life] to *the son of Huon de Froicapelle*, on the first day of May […] and for one half of 10 pounds which the city owes for always to the son of the said Huon de Froicapelle, on the day of St. John the Baptist.
[11 April 1316] Item, paiiet a maistre Jakemon de Froikapelle pour se pension de le Pasque, 7 lb. 10 s.	Item, paid to *maistre* Jakemon de Froikapelle for his Easter pension, 7 pounds and 10 sous.

Series P: rolls of pensions

[1 October 1334] A maistre Jakemon de Froicapielle a se vie, 7 lb. 10 s.	To *maistre* Jakemon de Froicapielle for his life annuity, 7 pounds and 10 sous.
[16 April 1335] A maistre Jakemon de Froicapielle a se vie, 7 lb. 10 s.	To *maistre* Jakemon de Froicapielle for his life annuity, 7 pounds and 10 sous.

With his life annuity Jacobus de Montibus would have been independently wealthy like his father. That means he could comfortably study and teach at Paris, and be productive

as the arts master that the university wanted to keep.[61] This may explain, at least in part, why he had never before sought a benefice. For that is what the papal letter of 1316 states (see Appendix 2, ll. 2-3):[62]

> To our beloved son Jacobus de Montibus of Hainaut, Canon of the Church of St. Paul in Liège, greetings, etc. Your praiseworthy virtues of probity, on which the testimonies of trustworthy men commend you, persuade us to extend the right hand of apostolic liberality in order to make provision for you. That is why we wish to grant you, *who has up to now not obtained an ecclesiastic benefice*, the special favor of a canonry of the Church of St. Paul in Liège, with the fullness of canon law, as well as the prebend owed by law to no one else, if one is vacant in the same church at present, with rights and all appertaining things conferred on you and provisioned for you by [our] apostolic authority.

Unless there were exceptional circumstances, canonries were not normally awarded to individuals under the age of 40 or 45.[63] I would therefore conjecture that Jacobus de Montibus was born c. 1270-75. In that case, the four or five undergraduate years at Paris, from age 15 to 20, should have passed between about 1285 and 1295.

The fact that *maistre* Jakemon de Froicapelle of Mons was the same person as *magister* Jacobus de Montibus in Liège may explain one more thing. The Liège canon established thirty-one vigil services at the altar of St. Agnes in St. Paul's. A major consideration in choosing this altar would have been the eternal salvation of his mother Agnès de Froicapelle and his sister Agniés.[64] But now it is time to conclude our excursion and go back to the Berkeley treatise.

Problems in the Berkeley Manuscript

I mentioned earlier that the Berkeley reference to Boethius and Jacobus de Montibus could be seen as the counterpart of our modern footnote. One could paraphrase it in today's style like so: 'For the numerations and divisions of the chromatic, enharmonic, and diatonic genera, see Boethius and Jacobus de Montibus'. (For the sake of brevity I have omitted the author's words 'causa brevitatis'.) That piece of information was all we needed when we dealt with the short version of the story. Obviously we will need to return to the passage as a whole to learn what the Berkeley author meant by numerations and divisions.

[61] For the Jacobus who wrote *Speculum musicae*, complete leisure would have been a precondition if he was to make a thorough study of Boethius and then write an opus on music that came in seven monograph-sized volumes.

[62] Vatican, Archivio Segreto Apostolico Vaticano, Reg. vat. 64, fol. 263^{r}.

[63] The chief exception was the nobility. See David Lepine, *A Brotherhood of Canons Serving God: English Secular Cathedrals in the Later Middle Ages*, Studies in the History of Medieval Religion 8 (Woodbridge, 1995), 72-75. One could in principle receive a canonry without holy orders and without being legally of age. An example is the twelve-year-old Jacobus de Yspania who was awarded a canonry in Amiens Cathedral on 1 September 1324: 'Jacobo de Yspania […] nos volentes tibi, in duodecimo etatis tue anno uel circa ut asseris constituto, gratiam facere specialem canonicatum ecclesie Ambianensis' (Vatican, Archivio Segreto Apostolico Vaticano, Reg. vat. 79, fols. 297^{v}-298^{r}). An under-age boy could not have received so lucrative a benefice without the powerful backing of his family or benefactors. Bonnie Blackburn kindly pointed out the extreme example of a boy who received a canonry at age seven. See Edward E. Lowinsky, 'On the Presentation and Interpretation of Evidence: Another Review of Costanzo Festa's Biography', in *Journal of the American Musicological Society* 30 (1977), 106-28, at 110-11.

[64] Desmond, 'New Light on Jacobus', 32 and 38, doc. 11, dated 1340: 'item colit 31 vigiliis magister de Montibus de altari Beate Agnete in Ecclesia Beati Pauli'. The obit for canon Jacobus de Montibus in Anonie was celebrated on 20 February (ibid.), the feast of the regional saint Eucherius, whose relics were kept in the nearby Abbey of St. Truiden.

That is where problems begin. And it is where the long version of the story takes off.

Consider the whole passage, printed here below. It is almost indigestible, especially upon first reading. And yet it makes coherent sense in at least one way. The author wants his readers to know that he is about to supply an illustration. More specifically, he will (1) put together a monochord of some kind, and (2) depict certain technical things—more clearly, one hopes, than he describes them here. In addition, the author will (3) spare his readers the headache of numerating and dividing, though they are welcome to look it all up in Boethius or Jacobus de Montibus should they choose to:

Ut autem precedencium armonieque triplicem ordinem, cromatis, ennarmonii, videlicet, et dyatonici generis, ortus habeatur, (1) hic tale monocordum componam, triplicem utriusque generis consonanciam dyapason continens. (2) Regularis et irregularis monocordi differencias et species speculative quoad practicam circulariter depingam. (3) Numeraciones et divisiones, causa brevitatis, ad Boecium seu ad Iacobum de Montibus, si reperiatur, remitto, scilicet, cromatis, quod est ♭ rotunda, ennarmonii, quod est cantus naturalis, dyatonici, quod est ♮ quadrata, omnium quorum hic patet divisio.	However, in order to obtain the threefold order of the preceding things and of the harmony, that is, the beginnings of the chromatic, enharmonic, and diatonic genus, I shall (1) put together such a monochord here, containing the triple diapason consonance of [each] genus. I shall (2) depict in circular fashion the *differentiae* and *species* of the regular and irregular monochords, in speculative fashion as far as practice is concerned. For the sake of brevity I (3) leave the numerations and divisions to Boethius or to Jacobus de Montibus (if it be found), namely, of the chromatic, which is round ♭, of the enharmonic, which is natural song, of the diatonic, that is, square ♮, of all of which things the division can be seen here.[65]

This much is clear, then: the author is about to visualize some very difficult topics. Yet the reader is not in a position to guess what they are. Just about every concept in the passage is mentioned here for the first time. And by 'here' I mean: at the very end of the treatise, when there is no time left to explain them even belatedly. Right away the author promises to illustrate 'the preceding things'. But what he says about them cannot be found anywhere in the treatise, before or after. He goes on to speak of a 'three-fold order of harmony'. We can find resonances of this expression earlier in the treatise, for instance in the list of topics announced at the beginning: 'I shall discuss the harmonic body by three members.'[66] Shortly after this the author does indeed speak of three harmonies.[67] But these turn out to be the consonances of the fourth, fifth, and octave, which have no relevance to what he describes here. He will mention those consonances again in his discussions of the monochord.

In the present passage, however, we are told that the threefold order of 'harmony' comprises the ancient Greek genera: enharmonic, chromatic, and diatonic. These had not been explained before either. Had the author been able to hear the original enharmonic genus, he might well have hesitated to speak of harmony: it contains two successive quartertones. But then it is unclear if he had a precise notion of what the

[65] Ellsworth (ed.), *The Berkeley Manuscript*, 226-27.
[66] Ellsworth (ed.), *The Berkeley Manuscript*, 186-87. See below for further discussion of the list.
[67] For this and what follows, see Ellsworth (ed.), *The Berkeley Manuscript*, 188-89 and 226-27.

genera are. At this time one could not blame the average musician for not knowing anything about them. The genera were concepts that belonged to speculative music theory, that is, music theory as a branch of natural philosophy, studied as a purely academic endeavor. It would be impossible to define them without an advanced academic background. It took multiplications, divisions, and subtractions that involved three- and four-digit numbers. Who has time for that?

Not our author. He chose to leave those calculations to Boethius and Jacobus de Montibus. This, he said, was 'for the sake of brevity'. It is true that the treatise was at this point already growing to an alarming 1,000 words, approaching the combined size of three abstracts for an AMS national meeting. Yet if brevity was an issue, why bring up such an unfeasibly difficult and time-consuming topic in the first place? And at the end of the treatise at that?

Yet the genera were more than theoretical constructs. They had made musical sense in days long past, and they could still be conceived in practical terms. Properly understood, the genera were three different ways of tuning four strings, that is, a tetrachord, of which the highest and lowest must be exactly one fourth apart. The diatonic genus is easy: ut-re-mi-fa. The chromatic genus involves steps that the author might well have liked: a minor third followed by two semitones, one major and one minor, as in: G-B♭-B♮-C. That scale segment was not allowed in the gamut, but it could have rationalized, for example, the beginning of the B section of Solage's *Fumeux fume*, where the top part sings B♭-C-B♮ on the word 'fumeuse' (Appendix 5). However, the third genus, the enharmonic, was downright impossible: a major third followed by two quartertones that together make up a minor semitone.

Few authors in this period could wrap their minds around the enharmonic genus. How could anyone tune four strings by ear if they were meant to sound two neighboring quartertones? Even if the effort was successful, how could a regular person tell the difference from an instrument that was simply out of tune? And this is only about strings. How to be pitch-perfect in singing quartertones? Johannes de Muris, writing in the early 1320s, was mystified:[68]

In qua parte orbis terrarum, in quibus angulis regionum, sub qua parte caeli modo latitant alia duo genera, nescio. Nihil plus opinor nisi quod quasi contra naturalem inclinationem humanarum vocum ad cantus divisa sunt. Scio enim, quod aut vix aut numquam humana vox in his generibus concordaret nec umquam de seipsa certa esset; in instrumento tamen possibile est multum. Tamen non dubito, dura et aspera iniocundaque esset illa musica istorum duoram modorum hominibus imbutis in tertio genere diatonico, ut nos sumus.

I do not know in what part of the world, in what [remote] corners of regions, or under what part of heaven, the [chromatic and enharmonic] genera are hiding now. I am of the opinion that they were divided [on the monochord] against the natural inclination of the human voice to song. For I know that the human voice could rarely or never make concord in those genera. Nor could it ever be sure of itself—though it is quite possible on musical instruments. I do not doubt, however, that the music of those modes would be harsh, difficult, and unpleasant to people who are steeped in the third diatonic genus, like we are [today].

[68] Falkenroth, *Die* Musica speculativa *des Johannes de Muris*, 264 and 266.

Others wondered if Boethius had spoken of the enharmonic genus in jest.[69] To the extent that the chromatic and enharmonic genera received any attention, it was thanks to his *Musica*, I. xxi-xxiii. That is where every liberal arts student would have learned of their existence. For the first two books of Boethius were required 'hearing' in the master's classroom.[70] However, Boethius deferred the detailed demonstrations of the pitch ratios to the much less well-known Book IV (see below). It is those later parts, which few scholars had ever read, to which the Berkeley author directs his readers.

Now comes the astonishing part. The Berkeley author spoke of the three genera not as they are understood in speculative music theory, but as the three *hexachords* of the gamut. He took them to be the same thing. The three hexachords start on C, F, and G in every octave, and they are distinguished as natural, soft, and hard. Now, a genus of tetrachord has four strings by definition. That is what the Greek name says. By the same token, a hexachord has six. That is contradiction number one. Yet our author goes beyond that. He speaks also of three *octochords*, that is, octaves, likewise starting on C, F, and G but now distinguished as diatonic, chromatic, and enharmonic. That is contradiction number two. How could anyone read the *Musica* of Boethius and come away with such ideas? How could hexachords have any relevance to Boethius, who lived half a millennium before they were invented?

In fairness, the Berkeley author was not the only theorist to conflate the ancient Greek genera with medieval hexachords.[71] The *Speculum* Jacobus had heard of that conflation, yet he was not his usual censorious self when he drew attention to the error. We can tell this from two comments in *Speculum*, II. xxxv. 6 and V. xi. 1-2:

Item tres sunt modi cantandi in gamma vel palma contenti, scilicet per .♮. quadratum vel durum, per naturam, et per .♭. molle. *Nec sunt hi tres modi iidem cum tribus tactis modis cantandi diatessaron*, scilicet diatonico, chromatico, enharmonio, licet *hoc dixerint aliqui*, quia tria illa genera concurrunt in suis principiis et terminis, ut infra patebit, non ista.	Also, there are three ways of singing within the gamut or palm, namely through square or hard .♮., through nature, and through soft .♭. *And these three ways are not the same as the said three ways of singing the fourth*, that is, diatonic, chromatic, and enharmonic—although *some have said so.* For the three genera agree on their first and last notes, as will be apparent below, but the hexachords do not.

[69] Johannes Boen, in 1357, reported this as the supposition of an otherwise unknown commentator: 'Quamvis enarmonicum cantum Boetius aptissime dicat coaptatum, forsitan yronice locutus est, ut dicit commentator eius Linconensis' ('Although Boethius may say that the enharmonic genus is most fittingly attuned, perhaps he was speaking ironically, as his commentator from Lincoln says'). See Wolf Frobenius (ed.), *Johannes Boens* Musica *und seine Konsonanzenlehre,* Freiburger Schriften zur Musikwissenschaft 2 (Stuttgart, 1971), 54.

[70] The book itself did not circulate as widely as one might expect, considering the thousands and thousands of arts students in the later thirteenth and fourteenth centuries. Of the 137 surviving copies listed by Calvin Bower in 1988, only nineteen have been dated in these two centuries. Most of these were probably for monastic use. See Calvin Bower, 'Boethius' *De institutione musica*: A Handlist of Manuscripts', in *Scriptorium* 42 (1988), 205-51. There were copies in the college libraries at Paris, including the Sorbonne. For private individuals it would have been a very expensive proposition to have the *Musica*—with all its figures, tables, symbols, and Greek terms—copied for personal use. Jacobus says he had 'heard' ('audieram') the first two books in his undergraduate years, and had even copied excerpts from them (*Speculum*, II. lvi. 170). More recently he had had to borrow a copy from an unnamed 'distinguished person' (undoubtedly the owner of a large private library, like Godefroid de Fontaines or Pierre de Limoges) so he could study all five books as thoroughly as time allowed (*Speculum*, II. lvi. 12, 15-19). Perhaps it was in Liège that Jacobus experienced difficulty finding a copy he could keep at home for study.

[71] See Bonnie Blackburn's contribution to this volume. For examples, see Johannes Wylde, *Musica manualis cum tonale*, ed. Cecily Sweeney, Corpus scriptorum de musica 28 (Neuhausen-Stuttgart, 1982), 68-69, and Sergej Lebedev (ed.), *Cuiusdam cartusiensis monachi Tractatus de musica plana*, Musica mediaevalis Europae occidentalis 3 (Tutzing, 2000), 36. The Berkeley treatise departs from what appears to have been the general consensus. It equates the diatonic genus

Possumus autem tres cantandi diatessaron modos tribus conferre modis qui in gammatis dispositione continentur, qui sunt modus cantandi per .♮. quadratum vel durum, modus cantandi per naturam vel proprium cantum, et modus cantandi per .♭. molle vel rotundum. *Et dixerunt aliqui hos modos esse eosdem cum illis tribus modis*, diatonico scilicet, chromatico et enharmonio. Sed hoc stare non potest.	However, we can compare the three ways of singing the [tetrachord] with the ways contained in the disposition of the gamut, which are the way of singing through square or hard .♮. the way of singing through nature or proper song, and the way of singing through soft or round .♭. *And some have said that these are the same as the other three ways*, that is, diatonic, chromatic, and enharmonic. But this cannot be sustained.

Now that we are aware of this broader context, the illustration promised by the Berkeley author may make sense at least as the representation of a seriously mistaken idea. Figure 5 shows the result of his efforts.[72] The first thing to point out is that this is not a monochord like he said he would show. A monochord is a sound box with a single string. But where in the diagram is the string? This is only one of several examples that show the author using the term monochord in strangely non-literal senses.

What we see instead is the gamut, rolled up in the outer band of the circle, in such a way that ee-la-mi (about five minutes to the hour) and the F *grave* below Γ-ut (at the top of the hour) are neighboring steps.[73] Needless to say, going from one to the other would be like stepping into an empty elevator shaft and plummeting down three octaves. Yet it does show that the idea of visualizing the gamut as a circle was original, if perhaps not especially enlightening.[74] Within the circle there are nine ribbons which connect steps that are one or more octaves apart. The particular connections are between C and C, F and F, and G and G, mostly in neighboring octaves. The connecting ribbons name the octaves after the genera they are taken to represent: the diatonic octave, the chromatic octave, and the enharmonic octave.[75]

We find ourselves in a world of confusion. Is this the man on whose testimony we must rely for the identification of Jacobus, author of *Speculum musicae*? Why did he presume to write a treatise on a subject he was so obviously ignorant of? Who was this man?

with the hard hexachord, and the enharmonic with the natural; this is emended in the Ghent version. Later examples are listed in *Lexicon musicum Latinum medii aevi* (Munich, 1992-), under the lemmata *genus* I. 2. (übertragen auf die Hexachordgattungen), *chromaticus* C (auf die Hexachorde bezogen), and *enharmonicus* I. E. 5 (zur Bezeichnung der Hexachorde).

72 For the second circular diagram see below, Figures 6-8.

73 The 'b' that is two steps to the right (at about ten past) is marked natural, and is therefore *B*-mi, the third lowest step of the gamut. The F *grave* makes it theoretically possible to sing *B*-fa, a step that does not exist in the gamut. The 'f' at the top of the hour does not exist in the gamut either. The Berkeley author took it to be a low *F* right under the Γ-ut that starts the scale. If this step *F* was going to have a solmization syllable of its own, it could only have been 'ut' in a hexachord newly brought into existence.

74 I know of only one other treatise that represents the gamut in circular fashion. See Trad Holl. V, in *Traditio Iohannis Hollandrini*, ed. Michael Bernhard and Elżbieta Witkowska-Zaremba, 8 vols. (Munich, 2010-16), vol. 3, 63 and 202. Yet the anonymous author created the illustration to make a different point. He clearly had a thing for circular diagrams, as did countless fourteenth-century authors. His treatise presents four other circular diagrams that are not about the gamut; see ibid., 96, 103, 181, and 183.

75 'Dyapason dyatonicum, dyapason chromaticum, dyapason enarmonicum'. One is reminded of Marchetto of Padua who in his *Lucidarium* (1317-18) identified three types of octaves which he classed as enharmonic, chromatic-diatonic, and diatonic, respectively, depending on the interval species of which they were composed. Perhaps this is where the Berkeley author picked up the idea, though there appears to be no connection between his diagram and Marchetto's reasoning. See Jan W. Herlinger (ed. and trans.), *The Lucidarium of Marchetto of Padua* (Chicago-London, 1985), 364-67.

Figure 5. The first of two circular diagrams in Berkeley, Music Library, Ms. 744, fols. 58ᵛ-59ʳ. Ellsworth (ed.), *The Berkeley Manuscript*, 228-29

Doctor Goscalcus

As a matter of fact we do who know who he was. Although the treatise in Berkeley is often said to be anonymous, the author himself tells us who he is. His name was Goscalcus. He may not be as well known today as Jacobus, Muris, or Vitry, yet he was hardly a nobody. The teachings of Goscalcus were to influence the work of others for more than two centuries. The evidence attesting to his authorship is both internal and external. Internal because he identifies himself by name. External because theorists in the fifteenth and sixteenth century unanimously ascribed the work to him. They spoke of our treatise as 'the fourth part of Goscalcus'. One author referred to it as his 'Treatise on the Genera'. For these theorists, then, Goscalcus had written a book in four parts, of which our treatise was the last. That is exactly what we find in the Berkeley manuscript. I will come back to this later. First it may be helpful to step back and consider the work of Goscalcus as a whole, that is, the four treatises as a unit.

Table 1. Structure of the Book on Music by Goscalcus as it survives in its three complete sources

Lo	Ct	Bk	Sections	Topics	Pages in the Ellsworth edition
I	I	I	1	Guidonian hand, hexachords	32-47
			2	*mutatio* between hexachords	48-51
			3-4	*coniunctae* in the gamut	50-53, 52-67
			5-7	the eight authentic and plagal modes	66-75, 74-81, 80-85
			8	modes in polyphony	84-87
	[ins.]			[the 'fifth' Berkeley treatise]	
				musical examples	86-97
			9	fourteen species of intervals	98-109
II	II	II	1	the six simple species of discant	110-19
			2	advanced mensural theory	118-31
			[3]	*verbulare*, followed by examples	130-47
Mur?	III	III		elaboration of Muris, *Ars practica cantus*	148-83
				colophon of Goscalcus	182-83
		IV		treatise on the genera, with mention of Jacobus de Montibus (226-27)	184-239

Table 1 offers a schematic representation of the three complete manuscript versions we have today. The first thing to note is that the fourth treatise, in the bottom row, was a later addition to a three-part work that had already circulated without it. That work, identified here as Goscalcus I-III, begins with a short introduction in which the author announces and describes the three parts:

> Primo, de tonis sive modis omnium ipsorum, deinde de contrapunctu et nonnullis circa ipsum contingentibus; et denum de cognicione notularum cum suis pertinenciis practicalibus, intendo procedere Dei gracia mediante.
>
> With the help of God's grace, I intend to proceed, firstly, with the tones or modes of all [songs], thereafter with counterpoint and several things pertaining to it, and lastly with the recognition of notes and their pertinent practicalities.

The three-part work ends with a colophon in which Goscalcus identifies himself as the compiler, and specifies the date and place of completion.[76]

[76] Ellsworth (ed.), *The Berkeley Manuscript*, 182-83. The text as quoted here conflates the readings of Bk and Ct. The word *doctor*, at this time, was a general term for anyone who made a living as a teacher—like a choirmaster, for instance. The academic title Doctor was already in use at this time, but was awarded only to scholars who had completed years of study in one of the advanced faculties of theology, law, or medicine, and not before the age of about 35, if that early.

Et per hec sit finis huius libri, compilati Parisius anno a nativitate Domini millesimo trecesimo septuagesimo quinto, die duodecima mensis Ianuarii, per eximium doctorem Gostaltum francigenam.	And with this let there be an end to this book, which was compiled by the distinguished teacher Goscalcus, French by birth, at Paris on 12 January, in 1376 [1375 old style].

Note that Goscalcus speaks of the whole work as a *book*. Elsewhere he speaks of its three parts as treatises. I will adopt his usage, because it reflects the conventional hierarchy of text organization current at this time. In the broadest sense, a substantial text by a single author was called a work (*opus*, pl. *opera*). It was divided into books (*liber*, *libri*), which in turn were divided into treatises (*tractatus*, *tractatūs*), which in their turn were divided into chapters (*capitulum*, *capitula*).[77] Goscalcus uses only two of these terms, *liber* and *tractatus*. Ellsworth, the editor of the Berkeley manuscript, further divided the treatises into chapter-size sections counted in Arabic numerals. One corollary of all this is that when a theorist speaks of a 'treatise', he need not necessarily think of it as a self-contained, independently circulating work.

The three complete sources for Goscalcus I-III are Berkeley 744 (Bk), London 23220 (Lo), and Catania D39 (Ct).[78] They are represented by the vertical columns in Table 1; the rows stand for the four treatises. The differences between the manuscript versions are important to the following discussion. I will therefore distinguish the three versions according to manuscript. In what follows I will speak of 'Goscalcus III' in a general sense (that is, as we know it from the 1984 edition), but whenever there is reference to one of the three manuscript versions, it will be identified as 'Lo III', 'Ct III', or 'Bk III'. The treatise that mentions Jacobus de Montibus will be called Goscalcus IV. Altogether Goscalcus I-IV fill the whole of the Berkeley manuscript—all sixty-four pages of it.[79]

Goscalcus I-III is a serious and substantial work. It is a teaching manual on practical music going from hexachords all the way to florid counterpoint and *ars subtilior* notation. It is meant for the use of choirmasters (see below), many of whom were active in provincial towns where a copy of *Speculum musicae* would indeed be difficult to find. The boys under their care were the ultimate beginners. They started learning music and Latin at around six or seven years of age, when they had years ahead to reach professional levels of musicianship. As one would expect from the self-described teacher Goscalcus, the book is clearly organized, carefully edited, and without significant error or confusion. It was to find good use in different parts of Europe.

Most of the book is the work of Goscalcus himself, the most original section being that on *coniunctae*, the steps in the gamut that could be modified by sharps and flats.

Cf. Olga Weijers, *Terminologie des universités au XIII^e siècle* (Rome, 1987), 142-51. Goscalcus, needless to say, was a teacher in the first sense.

77 Jacobus arranges his *Speculum musicae* strictly according to this hierarchy. The whole is a 'work', divided into seven 'books', which in turn are divided into 'treatises', which in their turn are composed of 'chapters'. He provides no rubrics or numbers for the 'treatises', yet regularly refers back to clusters of chapters on one and the same topic as *tractatūs*. An example is his extended discussion of the three genera in *Speculum* V. viii-xiii, which is based on Boethius's *Musica* IV. v-xii (to be discussed below). He refers to it later as his *Tractatus De tribus cantandi diatessaron generibus* (V. xv. 15) Usage of these terms is not always consistent, because words like work, book, treatment, or chapter were used in a variety of everyday contexts.

78 For these and additional sources, see below, Appendix 3.

79 For the so-called 'Fifth' Berkeley Treatise, see below, Appendix 4.

Yet Goscalcus was also right to describe his work as a compilation. There was no shame in that. When the objective is to give future musicians of the church a solid education, one has to have the humility to accept that numerous topics have already been taught so expertly as to require no reformulation. It is in these terms that Goscalcus introduced his original Book on Music (I-III) at the beginning of Treatise I. He saw it as his job to sort through existing materials, borrowing what was best, resolving internal contradictions, and discarding things that were inconsistent or confusing. It is this eclectic approach that made the text so valuable to fellow-choirmasters everywhere. Goscalcus offered an all-in-one introduction to practical music. No longer did teachers have to piece things together from a variety of texts—including multiple versions of the perpetually shape-shifting *Ars nova* of Vitry. Here everything was brought together, updated, and expanded under the vision of a single, experienced teacher.

[…] quorum vestigia prout congruant racioni sequendo, capiendo aliqua de ipsorum dictis, aliqua dimittendo, et ponendo nonnulla alia circa practicam omnium cantuum predictorum, breviter tractaturus.	[…] following in the footsteps [of past masters] insofar as they agree with reason, borrowing the statements of some of them, discarding others, and adding a number of things about the practice of all songs of the aforesaid [masters].[80]

Of the debts to prior authors, one is more substantial than all others. Goscalcus III is in effect a pre-existing treatise that was incorporated in its entirety: *Ars practica mensurabilis cantus* of Johannes de Muris, also known as the *Libellus practice cantus mensurabilis*.[81] In Bk III and Ct III this text is so richly elaborated that one could justifiably speak of a commentary. It is fair to credit Goscalcus with its authorship, in the same way one would credit a commentary on Aristotle's *Physics* to the person who did the commenting, as well as, obviously, Aristotle himself.

Table 1 shows the elaborated version of Muris in the columns of Bk and Ct. Yet there is no counterpart in Lo. The latter source appears instead to present the original text of Muris (designated here as Mur).[82] This is puzzling. Why is there is no Lo III corresponding to Ct III and Bk III? Does the London manuscript perhaps give us an early version, that is, just Goscalcus I-II, without a third part?[83] At first sight that seems unlikely. Lo I and II clearly state that they belong to a three-part work, in words nearly identical to those in Bk and Ct.[84] Yet this need not mean that Lo I-II had never existed as an independent work.

[80] Ellsworth (ed.), *The Berkeley Manuscript*, 30-31.

[81] In what follows I will use the *Recensio maior A,* as edited by Christian Berktold on the basis of twenty-one sources. See Berktold (ed.), *Ars practica mensurabilis cantus secundum Iohannem de Muris: Die* recensio maior *des sogenannten 'Libellus practice cantus mensurabilis'*, Bayerische Akademie der Wissenschaften, Veröffentlichungen der Musikhistorischen Kommission 14 (Munich, 1989), x-xi.

[82] I wish to express my gratitude to Peter M. Lefferts and Travis Jeager for sharing their complete transcription of Lo with the scholarly community, on Thesaurus Musicarum Latinarum, <https://chmtl.indiana.edu/tml/14th/BERMAN1_MLBL2322> (accessed 22 June 2024). Their work has been of invaluable help to the research for this article.

[83] On the chronology of the sources for Goscalcus, see Gregorio Bevilacqua, 'Il *Comentum super cantum* di Roger Caperon: introduzione ed edizione critica' (Ph.D. diss., Università di Bologna, 2008), xlvi-xlvii.

[84] Goscalcus lists the three parts and their topics in the introduction; see Ellsworth (ed.), *The Berkeley Manuscript*, 30-31 (textual parallels with later passages underlined). Part I, he says, will be 'de tonis sive modis omnium ipsorum'. Unremarkably the first part takes off with 'Cum autem cuius toni siue modi sit cognoscere […]' (ibid., 32-33). Goscalcus goes on to describe Part II as being 'de contrapunctu et nonnullis circa ipsum contingentibus'. Equally unremarkably the second part begins (in the Lo version): 'Sequitur secundus liber, scilicet de contrapuncto'. Yet it concludes with a description that is taken verbatim from the introduction: 'Sic, igitur, de contrapunctu, et nonnullis eciam ipsum contingentibus' (ibid., 108-9 and 146-47). Finally, he promises that Part III will be 'de cognicione notularum cum suis

It could well be that the statements are editorial insertions, entered only after Lo I-II had been expanded to include Mur/Lo III. Alternatively one could posit that the opus had three parts from the start, with the Muris part in Lo being only lightly edited as yet.

The History of Goscalcus I-III

Fortunately there is no need to speculate. There are two ways to find out the answer. The first is to look for any words or phrases that are shared by Lo, Ct, and Bk but absent in Muris. If these are indeed exclusive to the trio of sources, then surely they must go back to Goscalcus himself: Lo could not have come by them from Muris directly. The same is true of the inverse, that is, text in Muris that is not found in Lo, Ct, and Bk. The result of this search is not lacking in clarity. Both possibilities are attested by at least seven examples.[85] On this ground alone it is justified to speak of Lo III rather than Mur, that is, an adaptation by Goscalcus rather than the original.

The second way of finding out is more interesting because it focuses on idiosyncrasies of editorial style and Latin idiom. This may get us closer to an understanding of Goscalcus and his background as a theorist. As the editor of his own work, he was bound to have a 'house style', imposed on everything he wrote and copied. If so, it should be possible to recognize his editorial hand, at least if he was consistent in the application of that style.

When we compare Mur and Lo III, we can find a consistent editorial change in discussions of *prolatio*. Prolation is the division of the semibreve ♦ into parts called minims ♦. There were two ways of dividing the semibreve: into three minims ♦ = ♦♦♦ or into two ♦ = ♦♦. To put it differently, there were two prolations, threefold and twofold. They were distinguished with adjectives modifying the noun *prolatio*. By almost universal custom the adjectives were *maior* and *minor*, greater and lesser. These are the adjectives that are used, as a matter of course, in Bk and Ct.

However, Lo uses a different adjective for the division in two. Whenever Bk, Ct, and Muris speak of *prolatio minor*, the London manuscript consistently reads *brevior*—shorter rather than lesser. That must be a usage peculiar to the editor of Lo III, all the more so as it is rarely found elsewhere. The question is whether this was indeed a consistent editorial style. If it was, we should find it in Lo I-II, too, provided they

pertinenciis practicalibus'. This part, too, is described with a literal quotation from the introduction. It begins (in the Lo version): 'Sequitur tercius tractatus de cognicione notulorum cum suis parciis practicalibus' (ibid., 146-47). These verbatim restatements indicate that the incipits and explicits were editorial additions entered, not in the course of writing, but after the three-part work was completed. It is typical for later additions to occur at the beginnings and endings of large textual units, as indeed they do here. They do not preclude the prior existence of a two-part opus. In a few moments we will encounter evidence to indicate that Lo I-II was originally a self-contained work.

[85] The relevant passages are indicated by the page and line numbers in Ellsworth (ed.), *The Berkeley Manuscript*, abbreviated here as BM, and by the page and sentence numbers in Berktold (ed.), *Ars practica mensurabilis cantus*, *recensio maior* A, abbreviated here as AP. Text shared by Lo, Ct, and Bk but not in Mur: (1) 'et potest esse […] converso' BM 152: 5-6; (2) 'quoad totum […] remotas' BM 156: 9-12; (3) 'semibrevis minoris […] imperfici' BM 160: 14-15; (4) 'brevis eciam […] totum' BM 160: 18-19; (5) 'et quia […] prolacionis' BM 168: 6-7; (6) 'quibus […] procedi' BM 172: 11-12; (7) 'idem […] pausis' BM 180: 12. Text in Mur but not in Lo, Ct, and Bk: (1) 'tamen […] dictum est' AP 22: 23; (2) 'brevem imperfectam […] minoris prolationis' AP 26: 29; (3) 'item […] hic' AP 33: 46; (4) 'sequuntur […] imperfici' AP 33: 47; (5) 'similiter […] duas semibreves' AP 37: 5; (6) 'nam quandocumque […] alterata' AP 37: 7; (7) 'et nota […] prolationis' AP 43: 4. The Muris sources closest to Lo III are Vatican, Bibl. Apost. Vat., Ms. Reg. lat. 1146, fols. 35^{r}-44^{v}, 45^{v}, and 46^{v} (significantly, this copy is interleaved with the first part of Goscalcus II on fols. 46^{r}-47^{r}) and Cambridge, Corpus Christi College, Ms. 410, second part, fols. 1^{r}-6^{r} (significantly, this copy, too, is followed by material related to Goscalcus II, on fols. 6^{v}-7^{v}). Cf. Ellsworth (ed.), *The Berkeley Manuscript*, 282.

include discussions of *prolatio*. There is no discussion of the topic in Lo I, yet we do find one in Lo II. And what we find there is that Goscalcus was just as consistent in Lo II as he was in Lo III. The evidence is shown in Table 2. Note that Lo is alone in using *brevior*. The word does not seem to have been in the dictionary of Goscalcus when he finalized the Bk and Ct version in 1376. Since Goscalcus was the editor of both Lo I-III and, at a much later stage, Ct/Bk III, one can only assume that *brevior* was the term he had originally learned from his teachers, and that he changed all occurrences of it into *minor* later in life. Why he would have done this, and so consistently at that, is another question. Yet it is a question to which we will have a plausible answer in a few moments.

Table 2. Frequency of the adjectives *minor* and *brevior*, as applied to the noun *prolatio*, in Lo, Bk, Ct, and Mur

Goscalcus II	**Lo**	**Bk**	**Ct**	
minor	2	11	10	
brevior	13	0	0	
Goscalcus III	**Lo**	**Bk**	**Ct**	**Mur**
minor	2	16	18	13
brevior	13	0	0	0

The technical term *prolatio brevior* is used also in four treatises from the fifteenth century. These are the *Musica* of Adam of Fulda, Anonymous XI, Anonymous XII, and the so-called Brieger Anonymous.[86] What these treatises have in common is that they are all from the Germanic-speaking part of Europe: Kremsmünster (Austria), Trier (western Germany), Bavaria (south-eastern Germany), and southern Germany at large. Perhaps the usage was unique to territories in the Holy Roman Empire—including most of what are now the Netherlands and Belgium. Is this where Goscalcus came from?

His name is obviously Germanic. But that need not carry particular weight. The name Godescalc is sometimes found also in medieval France, just as Goetschalk was current in the Dutch-speaking parts of north-west Europe. It is true that the theorist speaks of himself as *francigena* (see the colophon quoted above), meaning that he was born in the kingdom of France. But French-born and French-speaking are not necessarily the same thing. Besides, the medieval kingdom of France was significantly smaller than

[86] See Martin Gerbert (ed.), *Scriptores ecclesiastici de musica sacra potissimum*, 3 vols. (St. Blaise, 1784; repr. Hildesheim, 1963), vol. 3, 359-66, at 361 and elsewhere: '*in breviori prolatione*'; Richard J. Wingell, 'Anonymous XI (CS III): An Edition, Translation, and Commentary', 3 vols. (Ph.D. diss., University of Southern California, 1973), vol. 1, 1-173, at 155 and elsewhere: 'signum *brevioris prolacionis* temporis perfecti O'; Jill M. Palmer (ed.), *Tractatus et compendium cantus figurati*, Corpus scriptorum de musica 35 (s. l., 1990), 41-93, at 65 and elsewhere: 'in tempore perfecto *non brevioris* set maioris *prolationis*'; P. Altman Kellner, 'Ein Mensuraltraktat aus der Zeit um 1400', in *Anzeiger der Oesterreichischen Akademie der Wissenschaften, philosophisch-historische Klasse* 94 (1957), 73-85, at 75 and elsewhere: 'sic se habet minima *in breviori prolatione*'. NB. Johannes de Muris used the term *brevior* as a name for the imperfect breve; it has no relevance to the division of semibreves into minims. The variant *brevior* is not reported in the altogether twenty-six sources for the *Recensiones maiores* A and B of Muris's treatise edited by Berktold (ed.), *Ars practica mensurabilis cantus*, passim. Berktold grouped Lo (Lp in his edition) among the *Recensio minor* sources; of the other five sources in this group, I have been able to consult only Cambridge, Corpus Christi College, Ms. 410 and Vatican Library, Reg. lat. 1146 (above, n. 85).

the current Republic of France. Goscalcus could not have called himself *francigena* if he was born in Lorraine, Alsace, Franche-Comté, Savoy, or the Provence. That leaves only one part of the kingdom where subjects spoke a Germanic language: the county of Flanders, which was largely Dutch-speaking yet fell under the French Crown.[87]

So if we assume that the *francigena* Goscalcus had learned the expression *prolatio brevior* in a Germanic-speaking part of the French kingdom, and if we take his Germanic first name to point in the same direction, then realistically he could only have been born in Flanders. Yet no matter where he came from, it would have been natural for him to adapt the text of Muris to the Latin idiom current in the region of his birth. At this point in his life he may not have had the ambition to write for an international readership.

But at some point Goscalcus moved to Paris, perhaps to study at the university or perhaps to be professionally active as a musician. It is here, in Paris, that he would have discovered that *brevior* was a provincial alternative for what Muris had called *minor* from the beginning. To adapt his book to the more cosmopolitan Parisian ways of speaking about music, he purged his existing text of all occurrences of *brevior* and replaced them with *minor*. The thoroughness of the job is clearly apparent in Table 2. There is a sea change between Lo and Bk/Ct. The shift in usage is relevant to his testimony about Jacobus de Montibus. For if Goscalcus was indeed a musician educated in Flanders, not far from Liège, he must certainly have heard of the *Speculum musicae* and its author. We will see later on that he had more than just heard of it.

There are other changes in editorial style between Lo and Bk/Ct, and these have their own stories to tell. For example, the early version in Lo uses the word 'nota', for musical note, throughout. In Part III it agrees on this with the original text of Muris. Yet the word was consistently replaced by 'notula' in the later sources Bk and Ct. The sheer thoroughness with which this happened suggests that the difference had a particular significance no longer recoverable now. There is a similar difference with regard to internal references like 'see above' and 'see below'. Bk and Ct frequently refer to earlier or later passages with the adverbs *superius* and *inferius*, but in Lo these terms are all but absent. This could be another editorial practice Goscalcus adopted in Paris.

There is one more difference that deserves pointing out (Table 3). The difference this time is between Lo I-II, on the one hand, and Bk, Ct, and Mur, on the other. It may not appear dramatic in English translation, yet it does involve different Latin constructions that cannot but leap to the eye. In Lo, Goscalcus frequently speaks in the future tense when it comes to the proper application of his rules. For example, 'cantabitur' ('it shall be sung'). Sometimes he does the same in the subjunctive present tense: 'cantetur' ('it should be sung' or 'it may be sung'). Yet in Bk and Ct nearly all these verb tenses have been replaced by a different construction. It consists of the word 'debet' or sometimes

[87] Medieval Flanders was French in every sense that mattered. Protracted litigation ended up in the Parlement de Paris, rebellions were suppressed by French royal forces, taxes were paid to the French king, the law of the land came from Paris, the king of France controlled the currency, and during the Hundred Years' War, Flanders contributed to the war effort against England just like all other parts of the kingdom. Nearby territories like the counties of Brabant and Holland, or the prince-bishopric of Liège, belonged to the Holy Roman Empire. It is not far-fetched to assume that the usage *brevior* might have been in current in Flanders: two of the later attestations go back to sources copied in Kremsmünster and Trier (above), which as the crow flies are 580 km (360 miles) apart. From Trier to Bruges, in Flanders, was only half that distance, 290 km (180 miles).

'oportet' ('one must') plus an infinitive—in this case 'cantari' ('to be sung'). 'Debet cantari': 'it must be sung'. In English translation it does not make much of a difference. Yet the consistency with which Goscalcus implemented the change suggests that this could be another Parisian usage that he may have seen as more elegant, distinguished, and authoritative. It does in any case prove that Lo I-II was an independent work before the Muris treatise was added as Lo III.

Table 3. Changes in verb tenses between Lo and Bk and Ct

	Lo	Bk and Ct
Goscalcus I	ascendet	debet attingere
	cantabitur	debet cantari (2×)
	dicetur	dici debet (2×)
	dicentur	dici debent
	deprimetur	debet deprimi
	elevabitur	debet elevari
	finiretur	finiri debet
	terminabitur	debent terminari
Goscalcus II	aggravabit	debet aggravari
	altificabitur	oportet altificare
	ascendet	debet ascendere
	ascendetur	oportet ascendere
	discantabit	discantare debeat
	observaret	debet observare

In all this one can discern the outlines of a chronology that would have evolved in at least three stages. Goscalcus I-II was probably the original nucleus. It was subsequently expanded with the *Ars cantus mensurabilis* of Muris, only lightly edited at first. All this was probably done before Goscalcus moved to Paris. It is only in the latter city that he finished his revision of 1376. Goscalcus IV, the treatise that mentions Jacobus de Montibus, represents a further chronological stage beyond that. This stage could have been initiated at any time after 1376—perhaps years or even decades later.

Having now obtained this background, let us revisit this last stage, and pick up the thread about Jacobus de Montibus.

The Mystery of Goscalcus IV

Goscalcus had never planned to write a fourth treatise. Or at least he never made reference to any such plans, and he never said that there was subject matter left to be discussed. The colophon had sealed Goscalcus I-III. It was finished: all had been said. And yet Goscalcus would change his mind at some later point. When he resolved to write an additional treatise on speculative rather than practical music theory, he made sure that readers would not take it to be a single, freestanding work, independent from the book he had already completed. He saw it, rather, as the logical continuation of the

curriculum he had laid out before. It could not be read without that curriculum. In the preface to the fourth treatise, Goscalcus speaks immediately of 'the preceding things', that is, treatises I-III. Yet he does not seem to look on those treatises with a great deal of satisfaction. Goscalcus likens their subject matter to the milk of babes, like baby formula administered by bottle to a helpless infant. It had all been practical stuff, the stuff that choristers practiced in choir school every day but did not engage more advanced intellectual faculties.

Goscalcus applies the metaphor of 'the milk of babes' not just to the preceding treatises I-III, but also to his former self as their author. If his work had been of merely practical use, the blame was his. For he himself had then been nursed only on milk. Goscalcus was painfully aware of this in the second treatise, when he had to leave the discussion of minute divisions of rhythmic values to the *speculantes*, that is, scholars of music. Here as elsewhere, his humility is winning. Yet his self-reproach is harsh, especially if one considers the origin of the milk metaphor. It comes from the Epistle to the Hebrews, 5: 12-14, where it is not coincidentally applied to teachers. Here, St. Paul warns in no uncertain terms that those reared only on 'milk' are not qualified to teach the Gospel.

12 Etenim cum deberetis magistri esse propter tempus, rursum indigetis ut vos doceamini quae sint elementa exordii sermonum Dei. Et facti estis quibus lacte opus sit non solido cibo. 13 Omnis enim qui lactis est particeps expers est sermonis iustitiae, parvulus enim est. 14 Perfectorum autem est solidus cibus eorum qui pro consuetudine exercitatos habent sensus ad discretionem boni ac mali.	For although you ought to be teachers on account of your age, you yourselves need to be taught once again the elementary principles of God's Word. You have become like those who have need for milk and not of solid food. Every person who is a partaker of milk is like a little child, void of the Word of Justice. But solid food is of fully grown men who by their habits have developed a sense of the difference between good and evil.

We can infer from all this that Goscalcus started compiling I-III as a young and ambitious choirmaster, passing on the things he had learned not long ago from his own masters. Only this can explain why he describes the beneficiaries of his efforts as little kids without experience, 'pusilli imperiti' (see the quotation below). Yet his curriculum was nothing if not ambitious. His ultimate goal was to get choirboys to such a level of professionalism that they could sing motets and ballades in public. Such proficiency is documented, for example, in the Sainte-Chapelle in Paris, which lay within the precinct of the royal palace, and where advanced choirboys sang motets and ballades in the presence of the king of France himself.[88]

But now, as he started writing treatise IV, Goscalcus had partaken in the solid food of speculative music theory. He had read the *Musica speculativa* of Johannes de Muris, the *Musica* of Boethius, and the treatise of Jacobus de Montibus. As a newly refreshed *magister* he was ready to nourish his pupils on more substantial fare.

[88] Regulations drafted in 1350 for the choirboys at the Sainte-Chapelle in Paris stipulate that 'if the current [choirboys], or those in future, know their motets, ballades, and such-like quite well', they will not attend the music lessons after dinner, but must instead apply themselves to other activities. It suffices for them that they learn and memorize ('recorder') 'three or four motets, and equally many other things, every day after Vespers, but only in the event that they

Ad quam scire corda imperitorum emulor, hunc libellum componens ad scolarium disciplinam, et modum canendi, quibus edocens pro posse meo, secundum quod regularum edocet ritus, et mea ut pusillis prosit doctrina, tunc pusillis precedencia scripsi. Igitur qui tunc lacte pastus eram, hos lacte pavi, nunc autem cibo solido refectus, cupio huius pericie cibo solido refici amatores.	I contend with the minds of the inexperienced in order that they have knowledge [of music], putting together this little book [Goscalcus I-III] for the instruction of schoolboys, and for the way of singing. Teaching these things to the best of my ability, according to what the protocol of rules teaches, and in order that my teaching may benefit the little ones, I then wrote the preceding things for the little ones. Therefore I, who had then been nourished only on milk, nursed them on milk also. But now that I have been refreshed with solid food, I desire that lovers [of the art] may also be refreshed with the solid food of this experience.[89]

For the purposes of this article, the reference to the music theorist Jacobus de Montibus, shortly after this, is the crucial piece of evidence. But as I said before, its credibility is undermined by the surrounding text, which is unworthy of the name of treatise, and unworthy of the name of Goscalcus. Having lavished so much care on the preceding three treatises, how could he be content to send out so useless an addition into the world?

There are indications that the text of Goscalcus IV as we know it is a severely mutilated version of what was once a substantial work on speculative music theory. I have already noted that the passage which mentions Jacobus has no explanatory context. It refers back to 'preceding things' that are nowhere in the fourth treatise. It uses technical terms that have not previously been mentioned, defined, and explained. Most of the passage is incomprehensible. What does the author mean by a monochord that 'contains' three octaves? What are 'the species of the regular and irregular monochord', not to mention their *differentiae*, their distinguishing features? What are we to understand by 'the division of all these things', and how is the reader expected to recognize that division in the circular diagram (Figure 5)? To make matters worse, Goscalcus commits the capital blunder of equating the three genera with the three hexachords of the gamut (see above). Does he have a clear idea what his readers will find in Boethius and Jacobus de Montibus? Has he actually read them?

The trouble goes back to the first sentence of Goscalcus IV, in which he details his plans for the treatise that follows. He announces four topics:

Inchoacioni vero huius operis toni divisionem preferam; deinde corpus armonicum per tria membra; componam tethracorda, penthacorda, et cetera; insuper et monocorda pro facultate mei parvi ingenii compilabo.	For the beginning of this work, I shall give pride of place to (1) the division of the whole tone, thereafter (2) the harmonic body by three members. I shall (3) put together tetrachords, pentachords, and so on. Beyond this, I shall also (4) compile monochords, as the ability of my small wit allows.

must learn something in great haste for the king or the church'. See Michel Brenet, *Les musiciens de la Sainte-Chapelle du Palais* (Paris, 1910), 15-16, regulations 6 and 11. For other examples, dating 1411 and 1425, see David Fiala and Étienne Anheim, 'Les maîtrises capitulaires et l'art du contrepoint du XIVe aud XVIe siècle', *Analyse Musicale* 69 (2012), 13-20, at 4 and 6. A list of old regulations compiled at Notre Dame of Paris in 1408 includes a prohibition of mixing discant with chant while singing from a chant book, 'excepting the choirboys, for the sake of their training'. See Craig Wright, *Music and Ceremony at Notre Dame of Paris, 500-1500* (Cambridge, 1989), 348. Since *discantus* stands for polyphony in rhythmic notation, the prohibition must have been made in the wake of the bull *Docta sanctorum patrum* issued by Pope John XXII in 1324/1325.

[89] Ellsworth (ed.), *The Berkeley Manuscript*, 184-87.

It is difficult to match these topics with what comes next. To start with (1), the division of the whole tone, this was a centrally important issue in the fourteenth century. Most of the interest lay in the connection with *coniunctae*, steps in the gamut that could accommodate sharps and flats. Obviously, accidentals are a way of dividing whole tones (for example, C-D into C-C♯ and C♯-D) and fusing semitones (for example, B-C and C-C♯ into B-C♯). Yet when the author gets down to dealing with this topic, immediately after the opening sentences, he borrows a diagram from the *Musica speculativa* of Johannes de Muris which shows a division, not of the whole tone, but of the octave, from $^{2}/_{1}$ down to $^{9}/_{8}$.[90] That makes no sense. As to the second topic (2), there is not even a mention of what he just promised, a harmonic body consisting of three members. What was that supposed to be? We are only three sentences into the treatise, and already the plan seems have changed. However, there is a second diagram, also copied from Muris, which gives a hint of what Goscalcus may have meant. Perhaps the diagram as such is the body, and its three members are the fourth, fifth, and octave. Or so one must assume, in the absence of any explanation.

Goscalcus had said that the next topic would be (3) tetrachords, pentachords, 'and so on'. The relevant section turns out to be a digest of Boethius, *Musica*, I. xx. In this chapter Boethius narrates the progressive increase in the number of strings on ancient music instruments, starting with the original four of the tetrachord, and going up to eleven in the one-louder endecachord. The point of his narrative was to show how the strings in ancient Greek theory had come by their various names: hypate, parhypate, lichanos, mese, and from there to the eleventh string, hypate hypaton. Yet Goscalcus shows little interest in these names. Evidently this is not the story he wants to tell. Although his diagrams are modeled on Boethius, they seek to translate everything in terms of the gamut. As a consequence we cannot tell what his story is actually in aid of.

To make matters worse, Goscalcus interrupts the story with a sentence about 'ista tria genera' ('those three genera'), as if he had mentioned them before. He hadn't. Yet they must be the same diatonic, chromatic, and enharmonic genera that he would refer to in the passage about Jacobus de Montibus. It is in fact the topic that old Boethius went on to discuss immediately after the story of the strings (I. xxi). Goscalcus attributes the composition of the three genera to a certain Pteulex Egipcius, who cannot be anyone other than Ptholomeus Egiptius—as Ptolemy is called, a few lines later, in the Ghent source.[91] The reference to Ptolemy only makes the interruption worse, for what follows is one of his monochord demonstrations, copied almost verbatim from *Musica*, V. xiv.[92] After that the story goes on as if nothing had happened.

Yet the tale of the strings may not have been entirely without purpose. Remember what Goscalcus promised at the beginning: 'componam' ('I will put together') tetrachords, pentachords, and other string instruments. What he means by 'putting together' is providing an illustration. And indeed, the narrative as he tells it is accompanied by a

[90] For the two diagrams from Muris, see Ellsworth (ed.), *The Berkeley Manuscript*, 186-89, and Falkenroth, *Die* Musica speculativa *des Johannes de Muris*, 138-39 and 240-41.

[91] Ghent, Universiteitsbibliotheek, Ms. 70, fols. 64^{v}-65^{r}. Ptolemy was centrally involved in the earliest discussions of the genera and their tunings.

[92] Ellsworth (ed.), *The Berkeley Manuscript*, 206-9; Boethius, *Musica* (Friedlein), V. 14. This is Ptolemy's proof that six whole tones in succession do not make a perfect octave but exceed it by a hair, that is, the difference between B♯ and C♮, that is, the Pythagorean comma.

series of six illustrations of fourteenth-century string instruments: a fiddle, a gittern, two harps, and two psalteries.[93] These are not amateur sketches based on vague recollections. There is sufficient technical detail to suggest that the author had expert knowledge of the instruments.

What next? The last item was to be (4) a discussion of monochords. The plural is a contradiction in terms, given that there can only be one species of monochord. How many varieties can there be of a single-string instrument? Yet the actual text turns out to be a history of the modes, from Dorian to Mixolydian and beyond, along with their plagal companions. That is probably just as well, for throughout this section it remains unclear what the author understands by monochord. All but one of his 'monochords' are instruments with more than one string. His imprecise usage recalls the circular diagram above, which he described as a monochord even though it had no string at all.

As if this part of the Book on Music was not already incoherent enough, it ends out of the blue with the passage that refers to Boethius and Jacobus de Montibus. As I noted before, that passage has no context in the treatise. And it is followed by an illustration of—what, exactly (Figure 5)? What does it show but three regular octaves elevated to the distinction of diatonic, enharmonic, and chromatic, without having done anything to earn it?

This brings us back to the possibility I raised before. There is good reason to believe that Goscalcus IV as we have it is not the treatise he originally wrote. It is a collection of isolated scraps that remained after something disastrous had happened. The first image that springs to mind is that of a manuscript so badly burned that the original could only be reconstituted by gathering together the few pieces of parchment that remained. Not that this is an especially likely scenario. For us today, the explanation of choice in cases of textual chaos is that the text must be a *reportatio*, a set of lecture notes taken by a student. In that respect the Berkeley copy of Goscalcus IV may not be all that dissimilar from the version of Anonymous VII that survives in the margins of Bruges 528.[94] However, if all of this is true, and if we are left only with fragments of a treatise, what are we to do with the reference to Jacobus de Montibus?

The Wheel of Durán

Fortunately, there are several pieces of evidence that bring at least some sense to the picture. They may not solve all the mysteries surrounding Goscalcus IV, but they do give a compelling answer to the question that got us here. In the following discussion I will address three topics:

1. The music theorist Rubinet, who is unknown to us from any other source. It was he who proposed the analogy between the three genera of antiquity and the hexachords of the gamut. Neither he nor Goscalcus ever meant it to become the absurdity it is in Goscalcus IV.

[93] See the expert discussion in Christopher Page, 'Fourteenth-Century Instruments and Tunings: A Treatise by Jean Vaillant? (Berkeley, MS 744)', in *The Galpin Society Journal* 33 (1980), 17-35, at 21-23.

[94] See Sandra Pinegar, 'Exploring the Margins: A Second Source for Anonymous 7', in *Journal of Musicological Research* 12 (1992), 213-43. The source is Bruges, Stadsbibliotheek, Ms. 528, fols. 54^{v}-58^{r}.

2. The 'Wheel of Durán', a unique reproduction of the second circular diagram of Goscalcus IV in a book printed in 1492.
3. 'Mercury's Tetrachord', a mystifying illustration offered without any explanation other than the author's proud announcement that he himself made it.

To place these three points in context, Goscalcus enjoyed a significant afterlife in the fifteenth and sixteenth centuries. Most of the evidence comes from Spain, yet there is also an Italian source that attests to his influence. This is the *Liber Musices* of Florentius de Faxolis, compiled sometime between 1485 and 1492. Faxolis repeatedly acknowledges Goscalcus as one of the authorities on whom he relied. Yet he also cites him on something that must have happened very long ago, in the 1310s. We learn that the masters at Paris University had rejected the earliest modified semibreves, as they were known from Marchetto of Padua's *Pomerium* of c. 1316-17.[95]

Quasdam quoque Marchetti notulas, id est semibreves cum cauda ascendenti vel descendenti figuratas non comprobamus, quoniam in Parisiensi studio (ut Goschalchus inquit) doctores abiecerunt. Ideo talium figurationem non conseram.	And also, we do not approve of certain notes of Marchetto, that is, semibreves shaped with ascending [𝅜] or descending [𝅝] tails. For the masters at the university of Paris (as Goscalcus says) rejected them. Therefore I will not include the shapes of such notes.

It is interesting to learn that Marchetto's ideas reached Paris. Yet it need not be surprising. Jacobus must have known about his new notes from *Pomerium* directly.[96] And Vitry adopted them in some of the earliest versions of *Ars nova*.[97] The testimony of Goscalcus, as quoted by Faxolis, is that the masters at Paris (including, presumably, the *Speculum* Jacobus) firmly rejected the note-shapes of Marchetto, and by implication those of Vitry.

[95] See Florentius de Faxolis, *Book on Music*, ed. and trans. Bonnie J. Blackburn and Leofranc Holford Strevens, I Tatti Renaissance Library 43 (Cambridge, MA, 2010), 170-73. For the quotation about the notes of Marchetto, see ibid., 182-83. In the relevant passage *studium* is to be understood as *studium generale*, a common term for the university in the thirteenth and fourteenth centuries. Blackburn and Holford Strevens determined that the version of Goscalcus used by Faxolis was closest to Ct.

[96] This is not something that an author like Faxolis would have made up. The report undoubtedly goes back to the same version of Goscalcus from which he quoted elsewhere, presumably the final section of Book II. Jacobus shows his familiarity with *Pomerium* in *Speculum*, VII. xxxiv. 16-18, where he addresses a problem concerning alteration. When there are two semibreves between two breves 𝅜 𝅝 𝅝 𝅜 or between two dots · 𝅝 𝅝 ·, the unwritten convention had always been to double the value of the second (*altera*), like so: 𝅗𝅥 𝅝. That convention was known as alteration. It had never been possible to notate the reverse, that is, the doubling of the first (*prima*) semibreve. Marchetto solved that problem by giving the first semibreve a downward tail 𝅝, thus specifying the rhythm 𝅝 𝅗𝅥. So the alternative was 𝅜 𝅝 𝅝 𝅜 or · 𝅝 𝅝 ·. It is Marchetto's downtailed semibreve to which Jacobus objected in *Speculum* VII. xxxiv. 16-20. He quoted three of Marchetto's arguments, each of which was based on an *auctoritas* of Aristotle. First, it is natural for things to grow and gain strength as time progresses (*Auctoritates Aristotelis*, 164 auct. 58). Second, Art must imitate Nature, wherefore the second semibreve should reflect such growth (ibid., 269 auct. 16). But third, Art must imitate Nature *only* as far as it is able to (ibid., 145 auct. 60). Art is not obliged to always copy Nature's tendency to grow. It is perfectly admissible for it to create a sign to modify Nature's course. See Marchetus de Padua, *Pomerium*, ed. Joseph Vecchi, Corpus scriptorum de musica 6 (s. l., 1961), 48-53. To my knowledge there is no other French-language music theorist in the 1310s and 1320s who discussed Marchetto's notes, though Vitry borrowed them for his 'new art'. The direction of borrowing is not hard to surmise. Marchetto was senior to Vitry by twenty years, his *Pomerium* is about six times the size of *Ars nova*, and vastly superior in scope, substance, and learning to Vitry's practical manual on notation. Whereas Marchetto used the tools of academic disputation to discuss mensural notation, Vitry simply issued rules and posited new notes to be adopted unquestioningly by the uninitiated (above, nn. 6 and 8).

[97] Paris 15128, fols. 127^{r}-131^{v}; Vitry, *Ars nova*, 84-93. This is the version closest to the one Jacobus used. As for the dating of *Ars nova*, the arguments put forward by Edward Roesner in his introduction to *Le Roman de Fauvel in the Edition of Mesire Chaillou de Pesstain* (New York, 1990), 31 n. 70, still bear reading.

It would not be surprising if this rejection triggered the conflict I have called the 'Quarrels of the Note-Shapes'.[98]

Spanish music theorists were well acquainted with the work of Goscalcus.[99] Over the 140-year period between about 1480 and 1620, they left us no fewer than eight treatises that mention him by name. These are typically short texts on the art of singing plainchant. Their authors are Bartolomé de Molina, Juan Bermudo, Pedro Cerone, Cristóbal de Escobar, Domingo Marcos Durán, Alonso Spañon, and anonymous.[100] Sometimes we find Goscalcus in lists of the major authorities on whom they relied. And sometimes we find 'Gosc.' in the margin of some statement or other for which he is the source. Just as often, perhaps, materials of his may have been used without acknowledgement.[101]

The most helpful references are those of Cristóbal de Escobar (Table 4).[102] The reason is that he seeks to be as exact as possible about the locations in Goscalcus to which he refers. One can tell from what he says that the copy he owned consisted of four parts. His interest was chiefly in two things: *mutatio* (that is, the proper transition from one hexachord to its overlapping neighbor above or below), and the Greek genera—the very topic of which Goscalcus IV had made such a mess. Escobar refers to these and other topics by treatise and chapter number. This is intriguing because none of the copies of Goscalcus that survive today are divided into chapters (see above). Escobar must have used a different redaction or revision of the book. The important thing now is to find out what Escobar and other Spanish authors said about Goscalcus. The upshot can be summarized in three points.

[98] See Johannis de Muris, *Notitia artis musicae et Compendium musicae practicae; Petrus de Sancto Dionysio Tractatus de musica*, ed. Michels, 74. In the relevant passage Muris explains why he is going to devote two chapters to note-shapes and note-names: '[…] cum modo tempore nostro super hoc cotidie nostri doctores musicae ad invicem <conrixantur>' ('because now, in our time, our masters of music are quarreling with each other every day upon [this topic]'). The majority reading 'convixantur' implies a Latin verb convixari which, if it exists, must be a derivation of convixi, i.e., the perfect active tense of convivere, to live and dine together. That could hardly have been the situation among musicians at Paris in 1319. Muris himself steered well clear of the debates, and preferred to work out the problem on his own. Vitry would surely have been at the center of the quarrel. His multiple revisions of *Ars nova*, and his combative tone, attest to a climate of intense rivalry.

[99] On this topic, see, amongst others, Bonnie Blackburn, 'Music Theory and Musical Thinking after 1450', in *Music as Concept and Practice in the Late Middle Ages*, ed. Blackburn and Reinhard Strohm, The New Oxford History of Music 3, pt. 1 (New York, 2001), 301-45, at 309-12; Santiago Galán Gómez, *La teoría de canto de órgano y contrapunto en el Renacimento español: la* Sumula de canto de organo *de Domingo Marcos Durán como modelo*, Estudios sobre música antigua 1 (Madrid, 2016), passim; Pilar Ramos López, 'Spanish Treatises on Musica Practica c. 1480-1525: Reflections From a Cultural Perspective', in *Companion to Music in the Age of the Catholic Monarchs*, ed. Tess Knighton, Brill's Companions to the Musical Culture of Medieval and Early Modern Europe 1 (Leiden, 2017), 469-503. I am grateful to Bonnie Blackburn for pointing out the reference to 'Goscaldus' in Antonius Possevini, *Bibliothecae selectae*, 2 vols. (Rome, 1593), vol. 2, 184.

[100] See Galán Gómez, *La teoría de canto de órgano*, 188 tab. 23.

[101] An example is the definition 'Est enim disiuncta vehemens transitus ab una deduccione in aliam' (Ellsworth (ed.), *The Berkeley Manuscript*, 48) which is unique to Goscalcus, but was copied without his name in Luis de Villafranca, *Breve instrucción del Canto llano* (Seville: Sebastian Trugillo, 1565), sig. A^{v}, margin, and in a short treatise in the Catania Ms. D39, fol. 39^{r-v} (Bevilacqua, 'Il *Comentum super cantum* di Roger Caperon', xxxii).

[102] The references to book II are not easily reconciled with the surviving sources for Goscalcus. *Mutatio*, *coniuncta*, and *disiuncta* are all discussed in Goscalcus I—not II, which is about counterpoint, contrapuntal diminution, and advanced mensural notation. However, the genera do belong to Goscalcus IV as we know it. But the Berkeley and Ghent manuscripts have neither chapter numbers nor substantial discussions to connect Escobar's references.

Table 4. Comparison of the locations in Goscalcus to which Cristóbal de Escobar refers in his *Introduction muy breve de canto llano* (s. l., [probably 1496]), and the corresponding locations in Lo, Ct, and Bk

Escobar chapter in which the reference is made	**Parts and chapters in Goscalcus that Escobar refers to**	**Ellsworth (ed.), *The Berkeley Manuscript*, treatise, section**
[7] conjunctas	I. 2	I. 3
[2] mutanças	II, 1	I. 2
[2] mutanças	[II], 3[103]	I. 2
[3] disjunctas	II, 6	I. 2
[6] generos	IV, 2	IV
[6] generos	IV, 3	IV
[6] generos	IV, 5	IV
[6] generos	IV, 6	IV

First, Spanish music theorists noted that of the three ancient genera, only the diatonic was still in use. The enharmonic genus had been abandoned long since, and the chromatic genus was useful only in part. For this information they relied on the authority of Goscalcus. The issue of conflating genera with hexachords is nowhere in sight. Here is how Alonso Spañon put it in 1504:[104]

Enpero segund dize el Goscaldo ensu tratado delos generos, el <en>armonico todo es apartado de nuestro uso, y la mayor parte del cromatico, ansi que no usamos en nuestro tiempo salvo el genero diatonico en todo & el cromatico en parte, & segund alguna semejança.	However, according to what Goscaldo says in his *Treatise on the Genera* [= Goscalcus IV], the enharmonic genus has totally disappeared from use, and also the larger part of the chromatic. That is, we do not use [the three genera] in our time, except for the diatonic wholly, and the chromatic partly, and this according to a certain resemblance.

Second, despite their obsolescence, the old genera still bore a resemblance ('semejança') to the hexachords of the gamut. This made it possible to use the terms enharmonic, chromatic, and diatonic in a transferred sense, not asserting identity, but drawing simply on that resemblance. According to our Spanish authors, the first theorist who proposed this was a certain Rubinet or Rubinete, in a work that no longer survives. The particular place was the chapter entitled *Illatio gravium ad acutas* in Rubinet's Book III. Here is Escobar explaining the reasoning behind the proposal:[105]

[103] Escobar reads: 'Goscaldus. quarta parte capitulo. iii'.
[104] Alonso Spañon, *Esta es una introducion muy util & breve de canto llano* (Seville: Pedro Brun, 1504), Capitulo septimo delos generos, unnumbered page.
[105] Cristóbal de Escobar, *Introduccion muy breve de canto llano* (s. l., [probably 1496]), Capitulo de los generos, unnumbered page.

Los generos segund los antiguos son tres, scilicet chromathico, diatonico, & enarmonico, los quales el Boecio considera en su primero libro, capitulo *His igitur*. Pero esta consideracion es muy antigua & olvidada del uso. Pero aqui se dara alguna declaracion dellos, aunque no segund la doctrina antigua, mas segund alguna semejança dellos, dada por el Rubineto en su tercero libro, capitulo *Illatio gravium ad accutas*, con la qual las intensiones & remissiones del sonido se entiendan.	According to the ancients there are three genera, namely, chromatic, diatonic, and enharmonic. Boethius considers these in his first book, in the chapter beginning *His igitur* [*Musica*, I. xv]. But this consideration is very old and forgotten in practical use. Yet we will give some clarification of them here, albeit not according to the ancient teachings, but rather according to a certain resemblance posited by Rubinet in his third book, in the chapter beginning *Illatio gravium ad accutas*, by which one may understand the raising and lowering of pitch.

Third, the three genera in this transferred sense were defined and used as octave species, put together from species of fourth and fifth. Escobar, quoting Goscalcus, explains in some detail how the diatonic and chromatic octaves were to be constructed.[106] The results do not match the circular diagram in Figure 5, but at least they suggest there was some rationale behind it. It is just that the Berkeley copy of Goscalcus IV withholds that rationale from us. It looks like we are dealing with a lost tradition.

If we now look for other authors who wrote about the identity or analogy between hexachords and genera, we find two things. First, Jacobus affirmed that some people did indeed believe they were the same thing. We know now that this is not true of Goscalcus. It only seemed to be true because we cannot tell otherwise from the Berkeley manuscript. But when we now consider two other treatises, the *Tractatus de musica plana* 'of a certain Carthusian monk', and the *Musica manualis cum tonale* copied by John Wylde, it does not seem to be true of them either.[107] The monk speaks only of things being comparable, not identical.

Dyatonicum genus est quod procedit per tonum et tonum et semitonium minus, et huic *comparatur* cantus naturalis. Cromaticum genus est quod procedit per semitonium maius et tria semitonia minora, et huic *comparatur* cantus ♭ mollaris. Enermonicum vero genus est, quod procedit per dyesim et dyesim (hoc est per semitonium minus et semitonium minus) et ditonum, et huic *comparatur* cantus ♯ duralis.	The diatonic genus is that which proceeds by tone and tone and minor semitone, and 'natural song' is *comparable to* this. The chromatic genus is that which proceeds from a major semitone and three minor semitones, and 'soft song' ♭ is *comparable to* this. The enharmonic genus is that which proceeds by diesis and diesis (that is, by minor semitone and minor semitone) and a minor third, and 'hard song' ♯ is *comparable to* this.

[106] To the best of my understanding, Escobar says that the diatonic genus must be put together from the first species of fourth—tone-semitone-tone (TST), as between D and G, or A and D—plus its own reiteration, making altogether tone-semitone-tone-tone-semitone-tone (TSTTST), the white-key scale from A to G. Effectively this is the plagal protus mode, but without the final whole tone that completes the octave. The chromatic genus, on the other hand, must be put together from the fourth species of fifth (tone-tone-semitone-tone (TTST), as between G and D), plus all or part of its own reiteration, making altogether tone-tone-semitone-tone-tone-tone-semitone-tone (TTSTTTST), the white-key scale from C to D. That is effectively the plagal tritus mode.

[107] For the following quotations see Wylde, *Musica manualis*, 68-69, and Lebedev (ed.), *Cuiusdam cartusiensis monachi Tractatus*, 36.

And the treatise copied by Wylde speaks only of a smiling at ('arridere'), a responding to ('respondere'), a playing at ('alludere'), and an agreeing with ('congruere'). Something very gentle, by the sound of it.

Tres istae species sive regulae cantuum tribus musicae generibus videntur *arridere*, quibus utebantur antiqui, quae sunt enarmonicum, cromatium, et dyatonicum [...] ♮ quadrata seu dura, quam solo ♭ mollis genuit differentia, videtur enarmonico generi *respondere* [...] ♭ mollis, quae nomen ex re trahit, quia cantum mollificat, cromatico generi videtur *alludere* [...] Proprius cantus sive naturalis bene *congruit* generi diatonico.	Those three species or rules of songs [natural, soft, and hard] seem to be *smiling* at the three genera of music used by the *antiqui*, which are enharmonic, chromatic, and diatonic [...] square or hard ♮, which was created only by the difference from soft ♭, seems to *correspond* to the enharmonic genus [...] soft ♭ (which has this name because it softens the song) seems to be *playing* with the chromatic genus [...]. Proper or natural song *agrees* well with the diatonic genus.

The closer we look, the less reason there seems to be to blame Goscalcus for the ruinous state in which we find his fourth treatise. In the preceding treatises I-III we have seen him as a theorist who more than deserved the standing he enjoyed in subsequent centuries. The survival of a text like Goscalcus IV under his name is inexplicable. We do not know who was responsible for this. But even in the fragments that survive, we can recognize clear signs of the original and learned thinker we have come to know in Goscalcus I-III. There are two especially telling examples of this.

The first example is the second circular diagram, which I mentioned before but have not yet discussed. It survived the calamity that destroyed nearly all of the original text. But the text that once explained it did not. All we have, for both this figure and the one before it, is that same incomprehensible paragraph whose chief value for us is that it mentions Jacobus de Montibus.

Yet one could say that the image is self-explanatory, in the way that so many things look self-explanatory once they have been explained (see the Berkeley illustration in Figure 6). Once again we see the gamut rolled up in the outer band of a circle. Yet this time, each of its steps corresponds to the first syllable of a hexachord, written in the next-smaller band. From there it is easy to see that the syllables continue in ever-decreasing circles, all converging directly on the dot in the middle. The diagram is an illustration of irregular steps outside the gamut, of *musica ficta* (as Goscalcus preferred *not* to call it), steps that could only be represented on the black keys of a chromatic keyboard (see Appendix 5). Take, for example the hexachord extending inward from A la mi re, at a quarter past the hour. Going from ut to re is unproblematic. It is just the whole tone between A and B, solmized as ut-re. The next step, re-mi is also a whole tone. But now we must proceed from B natural. That means mi is C♯. That step lacks all justification in the gamut, on the eminently reasonable ground that it does not exist. But of course that is why Goscalcus designed the diagram: not to justify but to rationalize. The next two steps after C♯, fa and sol, present no problems: they are D and E. Yet the final step la calls once again for a sharp: this time it is F♯. Now, this example only concerns the hexachord on A la mi re. Yet we see the same thing in all other slices of the cake. The way of visualizing this is nothing if not original. The gamut is represented in circular form, suggesting perfection in the sense that nothing can be added to it, but is then cut into slices to account for almost every *coniuncta* that can be introduced in the gamut.

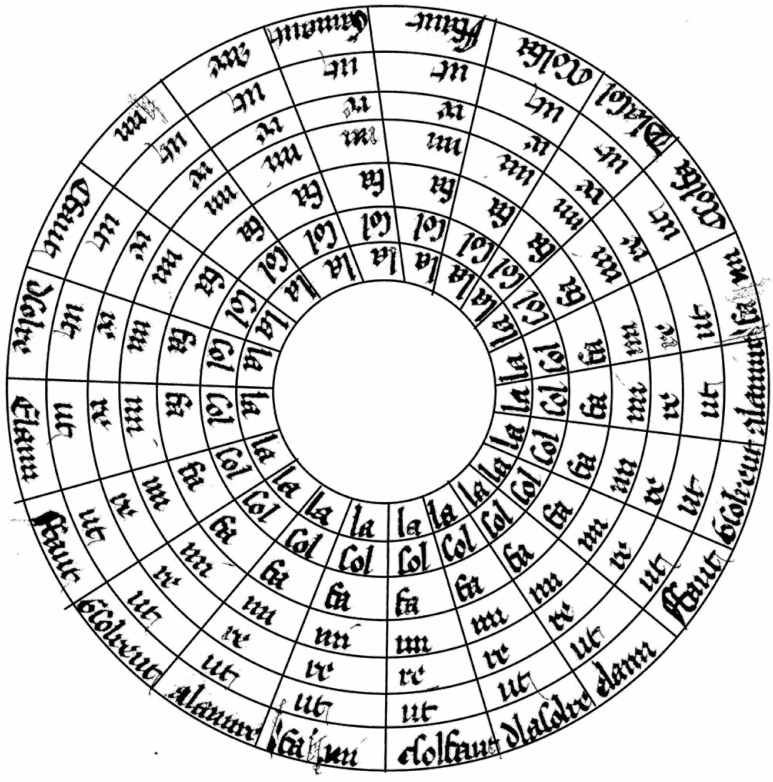


Figure 6. The second circular diagram of Goscalcus IV in the Berkeley Ms.

Like the first circular diagram, the second is transmitted also in the Ghent version of Goscalcus IV (Figure 7). Yet what is truly surprising is that the second survives also in a third source. Domingo Marcos Durán had it engraved for his treatise *Lux bella* of 1492 (Figure 6).[108] He even did his readership the courtesy of explaining it.

Esta figura sperica contiene ambas las antecedentes, demonstrando la musica proceder en una linea continua circular. E en cada signo 6 bozes & 18. mutanças, segund Sant Gregorio & sus sequences musicos theoricos y praticos la constituyeron.	This spherical figure contains both [*or*: all] of the preceding things, demonstrating how music proceeds in a continuous circular line. And in every sign there are 6 syllables and 18 mutations, according to how Saint Gregory and the theoretical and practical musicians after him put it together.

It is hard to imagine that this explanation came from Goscalcus in whatever version he may have used. If the gamut is to be represented visually, the appropriate image would probably be the ladder (*scala*), or else perhaps a sinuous line tracing the steps projected on the left 'Guidonian' hand. But it is not a circle, and music cannot usefully be said to proceed in a circular line. Moreover, Pope Gregory knew nothing of hexachords, which were not to be invented until more than four centuries after his death. Nor did he know

[108] For this copy, see also Roger C. Vogel, 'The Musical Wheel of Domingo Marcos Durán', in *College Music Symposium* 22 (1982), 51-66.

of solmization syllables, mutations, staves, clefs, or even letters that denote pitches. But the engraving in *Lux bella* does at least bear testimony to the enduring influence of Goscalcus.

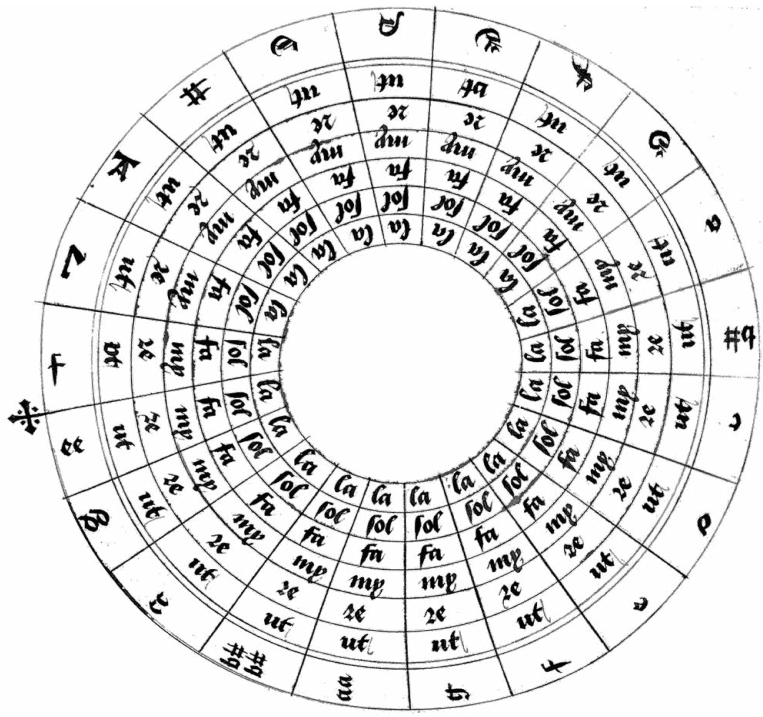


Figure 7. The second circular diagram of Goscalcus IV in Ms. Ghent 70

The Tetrachord of Mercury

And then, secondly, there is the mysterious Tetrachord of Mercury, that legendary four-string instrument that was invented in the dark mists of time, well before it occurred to anyone to add supplemental strings to it. Goscalcus is proud to announce that he has made an illustration of it, yet he does not suggest anything more complicated than a soundbox with four strings. His comment includes literal borrowings from the *Musica* of Boethius, which I have italicized here.[109]

Hic tethracordum Mercurii depingam, quia *quattuor cordis solum usus est*, diversas in eo dividens simphonias, *nichil in eo discordum senciens*, quod *duravit usque ad Orpheum*.	Here I shall depict the tetrachord of Mercury, because *he used only four strings*, dividing it into different consonances, *hearing nothing discordant in it*, which *lasted until Orpheus*.

After this we are feasted on a curious image (Figure 9). It features four strings exactly like Goscalcus said it would. Yet the strings do not have the same length. This alone suggests that we are not in the world of practical music here. The feasible way to tune a

[109] Ellsworth (ed.), *The Berkeley Manuscript*, 190-95 (see also the drawing on pp. 198-99); Boethius, *Musica* (Friedlein), I. 20.

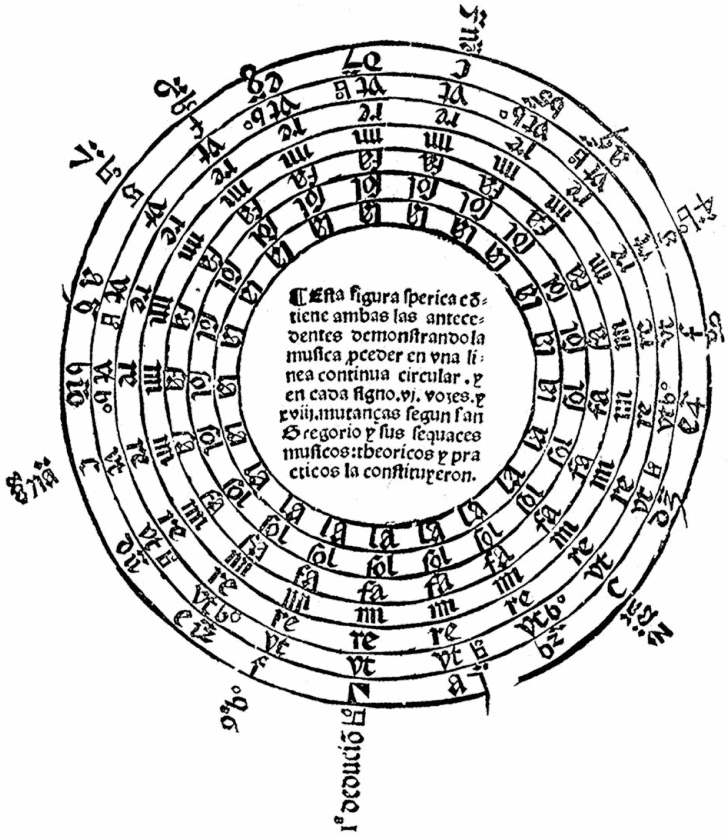


Figure 8. The second circular diagram of Goscalcus IV, in *Lux bella* of Domingo Marcos Durán (1492)

string instrument is to start with strings of equal length and then modify the pitch relationships by controlling the tension with tuning pegs. What the image in Goscalcus IV suggests is that the four strings are all under the same tension (perhaps by having the same weight attached on one end of each string), so that they must be tuned by making them shorter or longer. That is prohibitively impractical. Surely what we are looking at is the division of a single string, the monochord, each division being represented by a longer or shorter horizontal line. The relevant lengths of the strings are determined by the position of the monochord bridge.

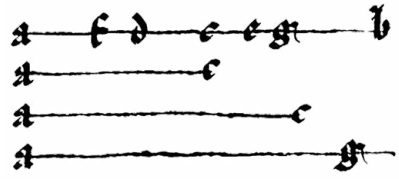


Figure 9. The tetrachord of Mercury, as depicted in the Berkeley Manuscript, p. 51

It is the letters that have proved hard to construe. In 1980 Christopher Page raised the possibility that the Berkeley illustration may be inspired by contemporary tablature

notation, that is, notation depicting strings, with the different pitches indicated as stop positions.[110] Yet the chief obstacle remained the letters: do they stand for pitches or for stop positions? In a response to Page's article, Jonathan Bates and Stewart McCoy demonstrated that the image must be read as a monochord, each line representing a different position of the bridge. The alphabet letters mark those positions. The diagram makes sense when we compare it to its probable source: the *Musica* of Boethius, Book IV, ch. 5. This is the first place in the treatise where Boethius demonstrates concretely how monochord division works, and how the various intervals are to be calculated. In this and the next seven chapters he will show the hexachord divisions and calculations of the diatonic, chromatic, and enharmonic genera. These chapters, 5-12 in Book IV, are the place to which Goscalcus referred his readers along with the corresponding text in Jacobus de Montibus.

Boethius and Goscalcus agree on the purpose of the demonstration. It is to derive the intervals of the unison, whole tone, fourth, fifth, octave, and double octave by dividing the monochord string at the appropriate points. This is done in successive steps, starting with the simplest division, into two parts. After that the number goes up. Or at least that is the idea. Table 5 shows the steps as Boethius made them in *Musica* IV. v. As one can see, each new stop or division point is marked by the next letter of the alphabet, reading from left to right.

Table 5. The monochord divisions of the diatonic genus, as presented by Boethius in *Musica*, Book IV, ch. 5

A						B	1	the whole string, stretched from A to B, sounding the unison
		C		D	E		2	division into *four* parts, with CB sounding the fourth, DB the octave, and EB the double octave
	F						3	division into *nine* parts, with FB sounding the whole tone
			G				4	division into *three* parts, with GB sounding the fifth
A	F	C	G	D	E	B		all stops in order, as found on the string

The plan followed by Boethius is confusing. If his readers are about to learn monochord division for the first time, some kind of logic to the series of steps would be helpful. Yet the sequence of steps he follows seems counterintuitive. For example, there is no first step for division in halves, which would have made it easier to make the fourfold division with which Boethius starts; it is a matter of dividing in half and then dividing in half again. And the steps after this seem strangely out of order: a ninefold division in step 3 that comes *before* the threefold division in step 4. Division into nine parts is easier when the string has already been divided into three parts; it is a matter of dividing in three, and then dividing in three again. This is hardly the ideal order in a teaching manual.

[110] For this and what follows, see Christopher Page, 'French Lute Tablature in the 14th Century?' in *Early Music* 8 (1980), 488-92; Jonathan Bates and Stewart McCoy, 'Mercury's Tetrachord', in *Early Music* 10 (1982), 213-15; and Ellsworth (ed.), *The Berkeley Manuscript*, 191 n. 7.

It does not help that Boethius does not assign letters to each and every stop in each division. For example, step 4 is a threefold division to be made with two stops. Yet only one of these is assigned a letter, G. The other remains unlabeled. Likewise, step 3 is a ninefold division to be made with eight stops. Once again only one of these gets a letter of its own. The consequence is evident from the bottom row, which shows the total sequence of stops on the string: AFCGDEB. If one had nothing but this sequence to go on, without illustrations or discussion, and if every stop had been given its own letter, it would be possible to reconstruct the divisions made by Boethius. This is because the position of each letter in the series allows us to distinguish between one division and the next. Take, for example the letter D: AFCGDEB. The next letter in the alphabet is E. We find it to the right of D. That means E is still part of the same division as D. If we had found it to the *left* of D, and it was supposed to be part of the same division, then of course it would have been labeled D rather than E. And the stop that now carries the letter D would have been labeled E. It is the left-to-right order that tells us which letter starts the next division.

We can tell from Table 5 that not only is E to the right of D, but D in turn is to the right of C: AFCGDEB. So now we have three stops in the same division, C, D, and E, making for four parts. That was step 2 in Table 5. The next letter F is not to the right of E but near the beginning of the sequence: AFCGDEB. Accordingly it must mark the beginning of the next division. But this division cannot be reconstructed. If Boethius had been consistent in assigning letters to all stops, we would have been able to recognize the ninefold division as well. But as it stands, only one stop is labeled, none of the others. So when we find G to the right of F, AFCGDEB, we have no choice but to assume, wrongly, that they belong to the same threefold division. The full sequence we should have found in Boethius is AFGCHIDKLEMNB, that is, the whole string AB, then the fourfold division created by the three stops CDE, and finally the ninefold division by the eight stops FGHIKLMN.

Let us now look at Mercury's tetrachord as it is depicted in Goscalcus IV (above, Figure 9). We go directly to the string at the top and copy the sequence of letters: AFDCEGB. What we must find out is if these letters can reveal the successive divisions of Goscalcus. Figure 10 will serve as a reference.

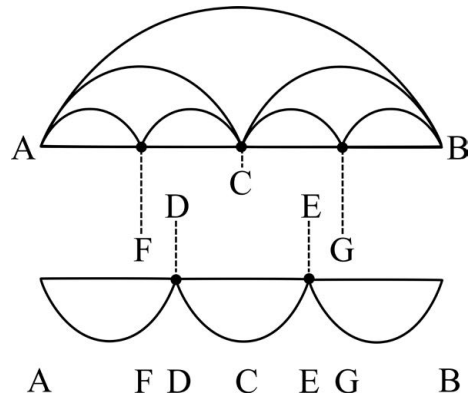


Figure 10. The successive hypothetical steps in creating Mercury's tetrachord, in descending order: (1) the undivided string AB, (2) division into two sections at point C, (3) division into three sections at points D and E, (4) division into four sections at points F, C, and G

We start with the whole string AB, as yet undivided.

Division 1. Naturally C lies between A and B. It marks the first division: AFDCEGB. The next alphabet letter D is to the left of C, and therefore not part of this division. So we have only one stop C, which divides the string into two equal parts.

Division 2. D is the first stop of the next division, being to the left of the existing stop C. E is part of the division as well, being to the right of D. But there are no further stops in this division: the next letter F is to the left of E. So we leave F for the next division, and keep the two stops D and E, which divide the string into three equal parts.

Division 3. After this the only remaining letters are F and G. In the sequence of letters they are further apart than D and E which demarcated the middle third of the string: AFDCEGB. This alone tells us that division 3 is into more than three parts—as of course one would expect. Since all parts within any division are equal, the distance from A to F must be the same as that from G to B. The part in between, going from F to G, can only be a multiple of that distance. A multiple, that is, of string sections equal in length to AF and GB. The consequence is that there must be a stop between F and G. The only problem is that we find no letter for that stop: F goes straight to G. Yet the explanation is simple. The stop between F and G has no letter because it has already been assigned one in a preceding division. That makes sense, for why should the same location on the string be given different letters in different divisions? A quick glance at Figure 10 shows that the only letter that qualifies is C, right in the middle of the string. So now we have a division in four parts, created by the three stops F, C, and G.

Altogether, then, the successive divisions in Goscalcus are in two, three, and four parts. Even in this modest illustration we can recognize the natural pedagogue Goscalcus. His tetrachord is effectively the answer to the question: what if we divided a string first in two, then in three, and then in four parts? That would be the didactic way of explaining monochord division, for it is easier to remember successive divisions by 2, 3, and 4 than by 4, 9, and 3.

It is a tribute to Goscalcus that his methodical way of explaining difficult topics is transparent even in the mere scraps of his treatise that remain—in this case, four horizontal lines and seven letters. There can be no question that he had carefully studied ch. 5 in Book IV of Boethius. But when he decided to borrow its monochord demonstration for his own Book on Music, he could not help tidying it up, lest the imperfections left by Boethius would end up hindering the learning experience of young pupils.

With this discussion we have arrived at the exact place where we need to be: Book IV, ch. 5, of Boethius. For as I noted earlier, this and the following seven chapters are the location to which Goscalcus referred his readers. If we can dwell in that location a little longer, we may just discover its counterpart in the work of Jacobus de Montibus.

'If One Can Find Him'

As Goscalcus said, 'I leave the numerations and divisions of the genera to Boethius or Jacobus de Montibus, if one can find him [*or:* it]'. Finding him: that is the job which remains for us at the end of this inquiry. *Can* we find the music theorist Jacobus de

Montibus? All we have to go on is the 'numerations and divisions' that Goscalcus promised we would find. The chapter of Boethius which we considered just now is the first of altogether eight chapters that deal with precisely this issue: Book IV, chs. 5-12. This chapter was as yet quite undemanding. The 'numerations' were childishly simple: all we had to do was divide the string into 2, 3, 4, and even 9 parts. Yet if we wanted to move on to the chromatic and enharmonic genera, as Boethius proceeded to do, we would quickly need a pocket calculator.

With all this we have obtained the one criterion by which we can recognize Jacobus de Montibus. His work must have contained a substantial section on the topic discussed by Boethius in *Musica* Book IV, chs. 5-12. Its treatment should be equally thorough and authoritative, if not more so. After all, why should anyone go out of their way to look for the treatise that was the harder to find, unless it truly merited the extra effort?

By these criteria, the least one can say for Jacobus, author of *Speculum musicae*, is that he is a viable candidate. As a matter of fact he is the only viable candidate. Chapters 26-37 of *Speculum* Book V are wholly devoted to chs. 5-12 of *Musica* Book IV. One could describe them as an elaborate commentary on Boethius. Jacobus goes over all the steps of each monochord demonstration with exquisite patience, and makes the subject matter easier to understand. In the process he nearly triples the word count of Boethius's chs. 5-12, from about 4,000 to 11,000. As if that were not thorough enough, he spends several additional chapters processing the implications of his discussion. If the *Speculum* is what Jacobus de Montibus had written, readers who were eager to learn would have done well to keep looking for it.

Yet how does Jacobus compare with other theorists in this period? To determine this, I will use a simple but effective method: raw statistics. It is reasonable to assume that an author who works on the Greek genera will make frequent use of the terms diatonic, enharmonic, and chromatic. So why not count the number of occurrences of these words in every treatise? If *Speculum musicae* was not exceptional in its treatment of the genera, then the result should not be significantly different from that of other treatises. But if it does exceed the others, *all* of them, even Boethius himself, then only he is likely to be the authority to whom Goscalcus referred. Not that this method is without pitfalls. Consider just the number of medieval spellings of 'enharmonic': *enermonicus*, *ennarmonicus*, *enormonicus*, *enormaticus*, *enharmoniacus*, and, not infrequently, *enharmonicus*. Likewise, *diatonicus*, *dyatonicus*, *diattonicus*, *diathonicus*, *diatonus* (adj.), and *cromaticus*, *chromaticus*, *kromaticus*, and other variations. And of course one has to find every case of each adjective. Another potential problem is that the term 'diatonic' could be used in many contexts other than the genera. So that search term must be excluded.

The raw statistics of the search can be presented in a kind of 'Top 15', ranking the fifteen works, or parts of works, that have the highest occurrence of the terms 'enharmonic' and 'chromatic'. The picture that emerges, based on the entire corpus of the online resource Thesaurus Musicarum Latinarum (TML), is shown in Table 6. I have sorted the results by approximate date, going from Boethius at the top to Girolamo Mei at the bottom. The dotted horizontal line stands approximately for the year 1400. What matters for our inquiry, then, is everything above that line. I have included the later treatises only to put the results in historical perspective.

Table 6. The 'Top 15' of medieval music theorists using the terms 'chromatic' and 'enharmonic'

Boethius, *Musica*, IV	6th c.	217
Boethius, *Musica*, V	6th c.	57
Adelboldus, *Musica*	11th c.	100
Hieronymus, *Tractatus*	1280s	173
Jacobus, *Speculum*, V	1320s	567
Jacobus, *Speculum*, VI	1320s	74
anon., Oxford Commentary	14th c.	114
Ciconia, *Nova musica*, IV	1403	127
Ugolino, *Declaratio*	15th c.	113
Anselmus, *De musica*	1434	81
Faber Stapulensis, *Elementa*	1496	66
Gaffurio, *De harmonia*, I	1518	231
Salinas, *De musica*, III	1577	606
Salinas, *De musica*, IV	1577	96
Mei, *De modis*	1567-73	120

There are several points we can immediately observe.First, with the exception of *Speculum musicae* and *De musica* of Francisco Salinas, none of the texts exceeds the total number of occurrences in Boethius, *Musica* IV-V, which is 274. That makes them less useful as alternatives to Boethius, and less likely to have earned the recommendation of Goscalcus.

Second, two authors are in the 'Top 15' only because their discussions are copies of chs. 5-12 of *Musica* Book IV. They are Adelboldus, in the first decades of the eleventh century, and Hieronymus of Moravia, in the final decades of the thirteenth. Even if Goscalcus somehow mistook either of these for Jacobus de Montibus, he could scarcely have recommended their treatises as worth looking for in preference to Boethius.

Third, only one author is anonymous. This is the Oxford scholar who wrote a commentary on Books I, IV, and V of Boethius, some time in the late fourteenth century.[111] Beyond Boethius, Jacobus, and him, there are only two other candidates before 1400. And they already had first names. In fact they are the same Adalboldus and Hieronymus we ruled out a moment ago. It follows that the Oxford Commentator is the only other person who could have had the name Jacobus—just as easily, of course, as he could have had any other name.

Although one cannot rule out the possibility that the Oxford Commentator was called Jacobus, his text is no match for *Speculum musicae*. True, it would have been harder to find than Boethius's *Musica*, for its only two sources were copied in Oxford. Yet one could scarcely describe the commentary as equal or superior to Boethius. There

[111] Matthias Hochadel (ed.), *Commentum Oxoniense in musicam Boethii: Eine Quelle zur Musiktheorie an der spätmittelalterlichen Universität*, Bayerische Akademie der Wissenschaften, Veröffentlichungen der Musikhistorischen Kommission 16 (Munich, 2002).

is a reason why its total score in Table 6 is only about 20 per cent of *Speculum musicae* Book V. Jacobus consistently expands on Boethius, while the Oxford Commentator consistently abbreviates. Again this is a matter of raw statistics. The eight chapters of Boethius have a combined word count of about 4,000. The Oxford Commentary devotes about 3,500 words to those same chapters, against the approximately 11,000 of Jacobus. The one opus worth looking for in the fourteenth century was *Speculum musicae*.

One reason for the brevity of the Oxford Commentator is that he was disinclined to walk the reader through each step of every demonstration. He was content to explain the basic method once, and then let the reader apply it in other situations. But of course that is exactly what makes his treatment an abbreviation rather than a commentary. The author offers a shortcut. Although he is generous with his discussion of chs. 5-6, the chapters after that take progressively less time. At the end he spends only a few moments on ch. 12.

Fourth and most importantly, the Jacobus who wrote *Speculum musicae* rises head, shoulders, torso, and femurs above all other contenders before 1400. The historical scope of his achievement becomes clear when we take all authors into account, both before and after 1400. Jacobus was not to be outdone, and then only by a narrow margin, until a quarter millennium later, by Francisco Salinas. It is he and Salinas who are contending, in different centuries, for first place.

Before leaving the matter at this, let us apply one additional control, to make sure that the picture is not distorted by possible flaws of methodology. Since the 'numerations' involve dozens of three- and four-digit numbers, and since it was essential that these numbers not be corrupted in transmission, they are an even safer pool of data to draw from. Besides, none of the numbers had any business being in places other than discussions of the genera. So there is little danger of counting false positives in other contexts. The results need to be discussed only briefly here. They are based on the forty-seven most frequently cited numbers in the relevant discussions predating 1400.[112] Only Boethius IV and Jacobus V refer to all of them. The combined total of references to any one of these numbers is 257 in both treatises. The Oxford Commentary falls well short of these statistics. The author mentions only seventeen of the forty-seven numbers, a mere third.[113] And as expected, the combined total of references is a dwindling seventy.

Conclusion

The central question of this article concerned the Jacobus de Montibus who is mentioned in the treatise of Goscalcus. Based on the specifics which the latter provides, his identity with the Jacobus who wrote *Speculum musicae* can be regarded as a matter beyond reasonable doubt. Of course one can always insist on the possibility that the author may have been a different historical individual as yet to be discovered. That is certainly a possibility—in theory. But in the absence of evidence to tell us anything about that other individual, such insistence cannot be called *reasonable* doubt. Doubts that presume undocumented possibilities are not doubts about the particular identification, but about

[112] While the raw statistics may be numbing, it is important to substantiate this point. The numbers are 78, 104, 117, 144, 156, 192, 208, 216, 234, 288, 312, 324, 384, 416, 432, 486, 576, 648, 768, 864, 1024, 1536, 2048, 2304, 2592, 2736, 2916, 2994, 3072, 3456, 3648, 3888, 3992, 4096, 4374, 4491, 4608, 5184, 5472, 5832, 6144, 6912, 7296, 7776, 7984, 8192, and 9216.

[113] The numbers are 78, 144, 192, 216, 288, 324, 384, 768, 2048, 2304, 2592, 2736, 2916, 2994, 4608, 6144, and 9216.

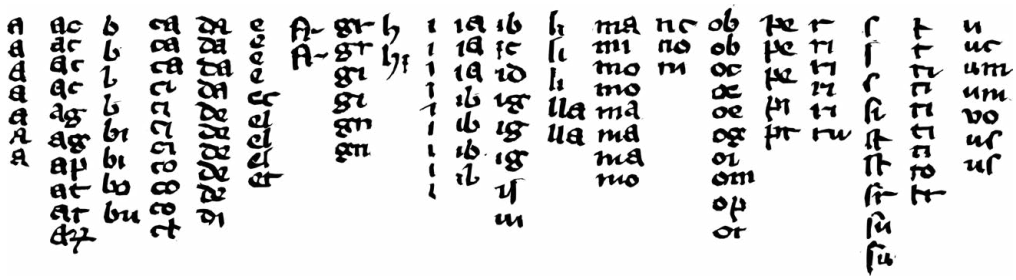
historical method in general. They cannot be settled by evidence, for there is none to be evaluated. They can only be addressed in the field of epistemology, the logic of science, where they are rejected as fallacies.

We have also briefly looked at another candidate for identification, a certain Jacobus de Montibus who was a canon at Liège. His candidacy is a compelling one. His first name matches. The toponymic matches as well—that is why Desmond discovered him in the first place. The dates match: the canon lived from about 1270/75 to 1340 plus or minus four to five years, and must have died in his sixties or early seventies. His place of residence, Liège, is another match. His academic activities in Paris match. Most compellingly, his interest in Averroist-leaning philosophy matches. Although this second candidate was called 'from Mons', his self-attested origin in the village of Froidchapelle makes him a native of the diocese of Liège. This explains why he received a benefice in the latter city rather than anywhere in the diocese of Cambrai. My research on him is still in progress. That is why I have not been able to offer more than an interim report.

Identifications are only helpful when they generate new research. Otherwise, what are they but names? Names are of little use as ends in themselves, as points where we can stop asking questions. In fact they can be a positive hindrance when they require evidence to be adjusted in order to make them appear plausible. But names, indeed even just the search for them, can be useful when they bring in fresh evidence that allows us to explain things that are otherwise hard to account for. Ideally a name and identity could become part of a comprehensive historical picture that can account for many more things.

Of course there remains the practical question what we should call the author of *Speculum musicae*. I do not propose that we must now all of a sudden speak of Jacobus de Montibus rather than just Jacobus. How could that be of benefit to ongoing research? Besides, the names of Jacobus (if I may cite the title of this article) are at least three, and probably four: De Ispania, Del Leodio, De Montibus, and De Frigida capella. Which would we pick if we had to? If there is one useful outcome to this inquiry, it is precisely that we need not look for a single 'official' name. There is none—not even De Montibus. I for one am content to keep calling him just Jacobus. Like the early thirteenth-century musician called Perotinus. Or like the theologian from the same century who was named Albertus. Or like the ninth-century emperor Carolus, or the seventh-century founder of plainchant Gregorius. And if Jacobus's first name is not specific enough, we can always add the epithet that has been bestowed on each of these four individuals, and call him Jacobus the Great.

Appendix 1. The Handwriting of Jacobus de Montibus vocatus De Frigida capella



Appendix 1. Figure 1. Ligatures and letter combinations in the hand of Jacobus de Montibus *vocatus* de Frigida capella, in Berlin, Staatsbibliothek, Ms. lat. fol. 624, fols. 191^{r} and 215^{r}

With formal scripts there is a low probability of finding a secure match in other sources, and a high probability of coming up with false positives. During the research for this article I have more than once made a note of scripts that looked like that of Jacobus de Montibus, based simply on a global impression while looking for something else. In each of those cases, letter-by-letter comparison revealed multiple discrepancies that disqualified the script. I take this to be an encouraging sign, for it adds plausibility to any script that may pass the test in future. For this reason I share the following list of criteria by which future candidates may be verified.

1. There are no capitals after the initial letter;
2. letters are not tightly compressed but leisurely spread (e.g., '9 s t r u c t o ē');
3. words are divided by comparatively long spaces (e.g., 'cognominati de frigida capella');
4. the letter **a** is double-storey not single-storey (as in '**c**apell**a**');
5. the **a**'s and **d**'s extend a little above x-height without reaching ascender height (cf. the word 'm**a**gr**d**');
6. the slant of the letter **b** tends to be rightward rather than strictly vertical or leftward (e.g., 'monti**b**^{9}');
7. the ears of the letters **g** and **r**, and the horizontal cross bar of the letter **t**, are typically prolonged, as if reaching out to the next letter; to some extent this is true of **c** as well (see, for example, '9s**truc**toē p**ti**ū', 'ma**gr**ī');
8. the letter **i** is undotted (*passim*);
9. while the letter **m** was usually composed of three separately-written shoulders, Jacobus de Montibus tended to connect them in a single stroke; as a consequence the shoulders of the **m**'s tend to be pointed rather than rounded, sometimes resulting in a zig-zag appearance (as in '**m**agrī', 'sū**m**a', and '**m**oīs');
10. the descender of **p** tends to curve to the right;
11. the **r**'s are minuscule, not *rotunda* (e.g. 'monocho𝆕d').

Appendix 2. The Benefice Awarded to Jacobus de Montibus in 1316

Vatican, Archivio Segreto Apostolico Vaticano, Reg. vat. 64, fol. 263r. This is a copy of a letter addressed to Jacobus de Montibus, authorizing him to claim his canonry. He would no doubt have presented it immediately to the church of St. Paul, to ensure that the next available canonry would indeed be conferred upon him. Only lines 1 and 2 provide personal information; these are translated above, p. 201. The remainder of the document consists of a standard set of clauses designed to expedite the transfer and prevent misunderstanding. We find the identical set of clauses in many other such papal letters, for example, that to fellow-applicant Galterus de Vasseyo (fol. 263r-v).

[1] Dilecto filio Jacobo de Montibus Anonie, Canonico Ecclesie Sancti Pauli Leodiensis, salutem et cetera. [2] Tue probitatis laudabilia merita, super quibus fidedignorum testimonia te commendant, nos inducunt ut ad providendum tibi apostolice liberalitatis dexteram extendamus. Hinc est quod nos, volentes tibi, nullum adhuc ecclesiasticum beneficium assecuto, gratiam facere specialem canonicatum Ecclesie Sancti Pauli Leodiensis, [3] cum plenitudine iuris canonici, ac prebendam nulli alii de iure debitam, si qua in eadem ecclesia vacat ad presens, cum iuribus et pertinentiis suis, apostolica tibi auctoritate conferimus et de illis etiam providemus. [4] Si vero nulla talis prebenda vacat ad presens in ecclesia supradicta, nos prebendam inibi proximo vacaturam, que de iure similiter nulli alii debeatur conferendam, tibi cum vacaverit donationi apostolice reservamus, [5] decernentes ex nunc irritum et inane si secus super hoc a quocumque quavis auctoritate contingerit attemptari, [6] non obstantibus de certo canonicorum numero et aliis quibuscumque statutis et consuetudinibus contritiis, ipsius ecclesie iuramento, confirmatione sedis apostolice, vel quacumque firmitate alia roboratis, [7] seu si aliqui apostolica vel alia quavis auctoritate in eadem ecclesiam in canonicatos sint recepti, vel ut recipiantur insistant, [8] quibus omnibus preterquam auctoritate nostra receptis vel prebendas aut beneficia expectantibus in eadem, te in ipsius prebende assecutione volumus anteferri, [9] sed nullum per hoc eis quo ad assecutionem aliorum prebendarum et beneficiorum preiudicium generari, [10] aut si dilectis filiis capitulo eiusdem ecclesie vel quibuscumque aliis communiter vel divisim ab eadem sede indultum existat quod ad receptionem vel provisionem alicuius minime teneantur, [11] et ad id compelli non possint quodcumque de canonicatibus et prebendis ipsius ecclesie vel de beneficiis ecclesiasticis ad eorum collationem vel quamvis aliam dispositionem coniunctim vel separatim spectantibus, [12] nulli valeat provideri per litteras apostolicas non facientes plenam et expressam ac de verbo ad verbum de indulto huiusmodi mentionem, [13] et alia quavis indulgentia dicte sedis generali vel speciali cuiuscumque tenoris existat per quam presentibus non expressam vel totaliter non insertam efficiens huiusmodi nostre gratie impediri valeat quomodolibet vel differri, [14] et de qua cuiuscumque toto tenore debeat in nostris litteris fieri mentio specialis, [15] seu si presens non firmatis ad prestandum de observandis statutis et consuetudibus ipsius ecclesie solitum iuramentum, [16] dummodo in absentia tua per procuratorem ydoneum et cum ad ecclesiam ipsam accessis corporaliter illud prestes. [17] Nulli ergo et cetera nostre collationis provisionis reservatis et constitutis infringere et cetera. [18] Datum Avinioni idus Novembris anno primo.

[19] In eundem modum, dilecto filio Abbati Monasterii Lantigniacensis Parisiensis dyocesis, et Nicholao de Ceccano Attrabatensis, et magistro Galthero de Auxiaco*

Noviomensis ecclesiarum canonicis, salutem et cetera. [20] Usque illud prestet quocirca discretioni vestra per apostolica scripta mandamus quatenus vos, vel duo, aut unus vestrum per vos, vel alium, seu alios, auctoritate nostra eundem Jacobum, vel procuratorem suum eius nomine, ex nunc in dictam ecclesiam Sancti Pauli Leodiensis recipi facientes in canonicum et in fratrem, stallo sibi in choro et loco in capitulo assignatis, [21] ipsum vel dictum procuratorem pro eo in corporalem possessionem huiusmodi prebende per nos sibi collate, si tempore collocationis per nos et fcem. de ipsam in ecclesiam predictam vacabat, [22] ac iurium et pertinentiarum ipsius inducatis et defendatis inductum, [23] alioquin prebendam per vos in eadem ecclesiam Sancti Pauli ut premittitur reservatam si ab huiusmodi reservationis tempore vacavit ibidem vel quam primum eam vacare contingerit eidem Jacobo vel dicto procuratori pro eo conferre et assignare curetis, [24] facientes ipsum pacifica illius possessione gaudere sibique de ipsius prebende fructibus, redditibus, proventibus, iuribus, et obventionibus universis integre responderi, [25] non obstantibus omnibus supradictis seu si prefatis capitulo vel quibuscumque aliis communiter vel divisim a sede sit indultum predictam quod interdici, suspendi, vel excommunicari non possint per litteras apostolicas non facientes plenam et expressam ac de verbo ad verbum de indulto huiusmodi mentionem. [26] Contra per censuram et cetera. Datum ut supra.*

* Galterus de Auxiaco, or Gautier of Auchy-la-Montagne, was one of the twenty-seven applicants in the 1316 petition of the university of Paris. He is mentioned here in the so-called *in eodem modo* clause, in which three individuals are appointed to help implement the papal provision. None of the other twenty-six papal letters mention Galterus in this capacity. One wonders if there is a personal connection with Jacobus de Montibus. Unfortunately, we know little more about Galterus than that he was a master of theology at the Collège de Sorbonne—the same position in the same college as once held by Godefroid de Fontaines

Appendix 3. Sources of the Book on Music by Goscalcus

(1) **Bk** Berkeley, University of California Music Library, Ms. 744 (Goscalcus I-IV). Usually dated 1376 after the colophon, but probably later, to account for the time it took to write Goscalcus IV after the completion of Goscalcus I-III in 1376.

(2) **Ct** Catania, Biblioteche Riunite, Civica e A. Ursino Recupero, Ms. D 39 (copied in 1453), fols. 12^{r}-30^{r} (Goscalcus I-III).

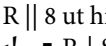
(3) **Lo** London, British Library, Ms. Add. 23220, fols. 1^{r}-14^{r} (Goscalcus I-III).
For a thorough analysis of sources 1-3, see Bevilacqua, 'Il *Comentum super cantum* di Roger Caperon', xxix-xlix.

(4) **G** Ghent, Universiteitsbibliotheek, Ms. 70, fols. 63^{r}-71^{r} (Goscalcus IV).

(5) **V** Vatican City, Biblioteca Apostolica Vaticana, Ms. Reg. lat. 1146, fols. 46^{r}-47^{r} (first part of Goscalcus II).

(6) **Bg** Bergamo, Biblioteca Civica, Ms. MAB 21 (*olim* Σ.IV.37), fols. 20^{r}-30^{r} (Goscalcus I-II). I have been unable to consult this source.

(7) **R** Source whose present whereabouts are unknown (Goscalcus I-III). This manuscript was in the possession of the Romance scholar Jean-Baptiste Roquefort until his death in 1833 at the latest; it has not turned up since. François-Joseph Fétis described it as 'an anonymous treatise on mensural music dated 1375', and published a French translation of a short passage from Goscalcus III as well a transcription of two songs included in the text. See Fétis, *Histoire générale de la musique depuis les temps les plus anciens jusqu'a nos jours*, 5 vols. (Paris, 1869-76), vol. 5, 298-99. The materials provided by Fétis include variants that distinguish R from the three chief sources Bk, Ct, and Lo. Daniel Seth Katz demonstrated this with regard to the two songs, see Katz, 'The Earliest Sources for the "Libellus cantus mensurabilis secundum Johannem de Muris"' (Ph.D. diss., Duke University, 1989), 48-51. The only other source to transmit these songs is Bk.

The text translated by Fétis can be integrated into the critical commentary of Ellsworth (ed.), *The Berkeley Manuscript*, 172, as follows: 3 reperiuntur Bk inveniantur Lo reperiuntur CtMur on trouve R || 4 nigre (*first*) Bk *not in* LoCtMur noires R | et rubee BkCtMur alie Lo les rouges R || 5 imperfecte BkLo vel vacue inperfecti Ct vel vacue sunt modi imperfecti Mur du mode imparfait R | ut hic BkLoCtMur comme on le voit dans cet example R | et si BkCt si que Lo item si Mur si R | inveniantur nigre, rubee vel vacue Mur *not in* BkLoCtF || 6 sunt temporis BkLoMur sint tempore Ct sont du temps R | alie sunt Bk alie Lo rubee erunt Ct alie quam Lo rubee vel vacue Mur et les rouges R | ut hic LoCtMur *not in* Bk comme on le voit ici R || 7 si vero BkCt si que Lo item si Mur si R | sunt (*first*) BkLoMur sint Ct sont R | alie sunt BkCt alie quam Lo rubee vel vacue Mur et les rouges R || 8 ut hic BkLoCtMur comme il suit R |  Bk Ct Lo R | Si autem procedere sic posset econuerso Lo *not in* BkCtMurF | Item coloribus superscripcionibus pausis et signis perfectum LoMur *not in* BkCt F| distinguuntur ab imperfectum Lo *not in* BkCtF distinguitur ab imperfecto et etiam cognoscitur Mur *not in* F|| 8-9 et nota quod…perfeccionem *not in* LoMur || 9 imponerent Bk importerant Ct sont pour R || 10 rubee vero Bk rubee vel vacue Ct les rouges F.

(8) **H** Honolulu, Library of Michael Asato Cuthbert and Elina Asato Hamilton (US-HONasato), Lat. 11: fragment of portions of Goscalcus I (corresponds to portions of Ellsworth (ed.), *Berkeley Manuscript*, 70-80, minus 71, 75, 77), including discussion of Muris.

Appendix 4. The 'Fifth' Berkeley Treatise

At the very end of Bk there is a text of 350 words, the size of a modern conference abstract, with six short musical examples. It is found also in Ct, but there it is inserted between sections 8 and 9 of Goscalcus I (see above, Table 1). In both sources we find it without a title or rubric, and without an introductory sentence or final *explicit*. It is a fragment. A third copy of the text survives in a compilation edited by Georgius Erber at Paris in 1460-62. See the online edition in Christian Meyer, 'La compilation sur la musique de Georgius Erber (Paris, 1460-1462) Innsbruck, Universitätsbibliothek, Cod. 962, f. 128r-163r', <https://hal.science/hal-01522251> (accessed 17 July 2024), 21-22. Here it does have a rubric, but it was written by Erber, not the original author. It reads: 'Nota opinionem cuiusdam; nescio si sit in toto uera', that is, 'Note the opinion of some person; I don't know if it is wholly true'. Seventeen lines later Erber does know: 'quod credo quasi totum falsum' ('I believe that almost all of it is false'). If Goscalcus ever incorporated this text into his own work (as is suggested by its insertion in Ct I), he must have done so for the same reason, that is, as a curiosity worth reporting, but not worth the trouble of refuting.

The text is confusing, and contradicts the scientific truths about music demonstrated by Boethius some eight centuries previously. The author starts with two premises. First, he says, the interval known as the major semitone (like, for example, the step between G♮ and G♯) is a *semitonium* worth one third of the whole tone. Second, the mi-fa interval known as the minor semitone (like that between A and B♭, or G♯ and A) is a *semitonus* worth two thirds of a tone. These premises are stated without argument or demonstration, or the name of some authority.

From here, the author works his way to a conclusion which he takes to be the corollary. He seeks to demonstrate that the intervals G♯-A plus A-B♭ add up to the whole tone G♯- B♭. Although that may be true in today's equal temperament, it defies all reason in Pythagorean tuning. The problems are twofold.

First, any interval between G and B is by definition a third, no matter what pitch modifications it may undergo. Alphabet letters have always stood for strings: that is why we speak of the 'six-string' or hexachord. In this case we are speaking of three strings: G, A, and B. What the author proposes is that we skip the string in the middle and leap directly from the G to B string, tuning these in a whole tone. That is easily possible in practice, but hard to rationalize in theory. There will always be the middle string as the shared point of reference for the outer strings. They must be tuned in relation to the A in between. It would be next to impossible to derive B♭ directly from G♯.

Second, the two intervals G♯-A and A-B♭ are both mi-fa, that is, the minor semitone in Pythagorean tuning. The author stated at the beginning that mi-fa is always a *semitonus* worth two thirds of a whole tone. If we took him at his word, then the two *semitoni* should add up to $^{4}/_{3}$, thus overshooting the $^{3}/_{3}$ fraction of the whole tone. Two cumulative mi-fa steps cannot by definition make a whole tone, for the tone is not divisible into equal halves. The only real whole tones in the discussion are G♯-A♯ and A♭-B♭. (Note, in this context, that Pythagorean fractions are to be multiplied, whereas the author's fractions are to be added up; the Pythagorean equivalent of his '$^{1}/_{3}$' is $\sqrt[3]{3}$, the cube root of 3.)

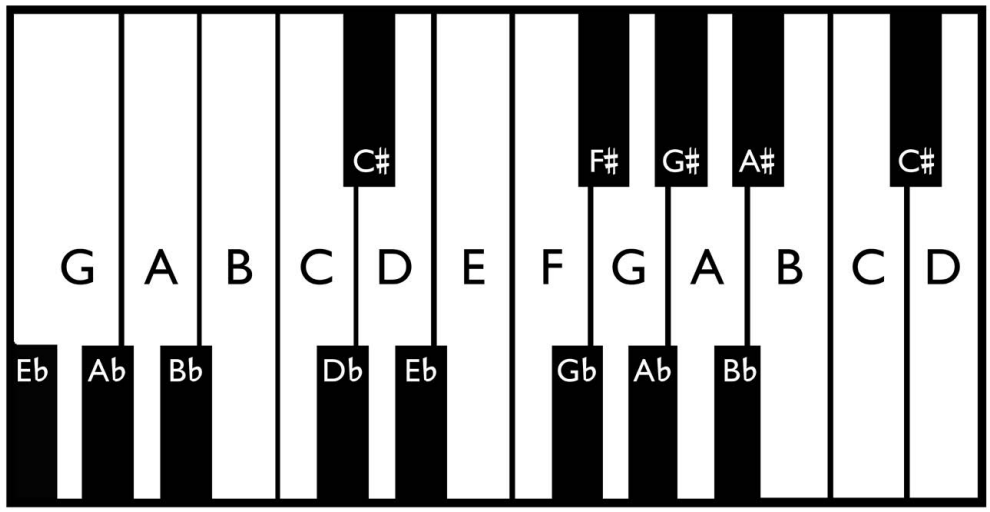
The critical mistake is that the author does not take the interval G♯-A to be a mi-fa semitone, despite the sign ♯ which turns G into a mi relative to A fa. It is this

mistake that leads him to think he has proven his point. If G♯-A is ⅓, and A-B♭ is ⅔, then of course they will add up to a whole tone, in defiance of the laws of solmization. But this fails to take into account several critical differences between the two semitones. The *mi*nor semitone is the *mi*-fa step. It is literally a step, in that the second pitch must be performed on a different string, the neighbor below or above. Accordingly that second step has a different alphabet letter from the first, like so: G♯-A or G-A♭. Two successive minor semitones are thus by definition to be performed on three strings, and thus add up to what is technically a third: G♯-A-B♭.

The major semitone, on the other hand, is an *inflection* of the pitch of a single string, and accordingly does not result in a change of letter. For example: A♭-A♮, or G♮-G♯. It is not allowed in the gamut, but could be easily heard on diatonic keyboards, since B♭ and B♮ were neighboring keys (Appendix 5).

More on this in Oliver B. Ellsworth, 'A Fourteenth-Century Proposal for Equal Temperament', in *Viator* 5 (1974), 445-53; Jan Herlinger, 'Fractional Divisions of the Whole Tone', in *Music Theory Spectrum* 3 (1981), 74-83, at 78-79. I am not persuaded that the anonymous author worked from a conception analogous to our modern equal temperament. The latter can only apply when the whole tone is divided into two equal parts, not three. That division was impossible in Pythagorean tuning, but is easily rationalized in equal temperament, by splitting a whole tone of 200 cents into two semitones of 100 cents each.

Appendix 5. The Chromatic Keyboard of Solage



Appendix 5. Figure 1. Hypothetical chromatic keyboard of the fourteenth century

In *Fumeux fume*, Solage seems to delight in the sheer irrationality with which flats and sharps can be applied in the gamut. In what follows I will be referring to the edition in Peter M. Lefferts, '*Subtilitas* in the Tonal Language of *Fumeux fume*', in *Early Music* 16 (1988), 176-83, at 177-78. Irrational is indeed the appropriate word, for every conventional sense of functionality is lost when, on the syllable 'spe-' (of 'speculacion', bb. 28-34), the top voice descends from G♯ to C♯ in a sequence of pitches that begins A-G♯-A♭-G, and ends E♭-D-C♯-D♭. One can no longer speak of a leading tone when G♯ 'leads into' A♭ which actually has a lower pitch (bb. 29-30); likewise C♯ into D♭ (bb. 33-34). The distance in both cases is a Pythagorean comma, unsingable by creatures lower than the angels. Meanwhile, the middle part has an even less rational sequence of pitches: B♮-A♭-B♭-F♯ (bb. 31-33). That is: down an augmented second (A2), up a regular whole tone (T), and then a fifth augmented by a major semitone (A5). One wonders if the human voice is capable of singing such intervals with the pitch-perfect accuracy that the math calls for.

Perfect accuracy could be achieved only on a special instrument of the kind Jacobus describes in the quotations below (see Figure 1). In addition to the white keys, the instrument should have two rows of black keys, one consisting only of flattened steps and the other only of sharpened ones. Naturally, both rows should be tuned relative to the white keys in the middle. It is best to keep them on different sides of the white keys, because there must not be direct communication between them. Solage has them communicate anyway. The diminished third G♯-A♭ (above) could only be performed by leaping from the black G♯ key at the top, across the row of white keys, and landing on the black A♭ key at the bottom. Figure 1 also confirms that the diminished third G♯-B♭ cannot be equivalent to a whole tone (see above, Appendix 4). The real whole tones in the image are G♯-A♯ (top row) and A♭-B♭ (bottom row).

Once the hypothetical two rows of black keys are divided, one can see that Solage never switches between them *within* bars, but only going from one bar to the next. The

most jarring progression across barlines is the Pythagorean comma pC (above); the top part has to produce it three times in the space of six bars (29-34). *Fumeux fume* also includes several other intervals that offend against the Gamut: the *major semitone* A1, *diminished third* d3 (2 minor semitones, or m2 + m2), *augmented second* A2 (= whole tone T + A1), *diminished fourth* d4 (= T + m2 + m2), *augmented fourth* A4 (= perfect fourth P4 + A1), *diminished fifth* d5 (= P4 + m2), and *augmented fifth* A5 (= perfect fifth P5 + A1).

It should be noted that there are at least three compositions from the fourteenth century in which the composer has the vertical augmented second B♭/C♯ serve in the place of the Pythagorean minor third B♭/D♭. These are anon., *Se grace* / *Cum venerint* / Ite missa est, tempus 4; Vitry, *O canenda* / *Rex quem metrorum* / — / Rex regum, tempus 53; and Machaut, *O livoris* / *Fons* / Fera pessima, tempus 68. Johannes Boen, writing in 1357, speaks of another example, *Floret cum vana gloria* / *Florens vigor* / Neuma quinti toni, in the motetus on the word 'Mardocheo' (tempora 94-102), yet there is not augmented second at either that point or in the rest of the piece. Boen, speaking of *Se grace* / *Cum venerint* / Ite missa est, says that the 'asperity' of the interval is 'propped up' (that is, kept standing) by its 'sweet circumstances'. This is familiar language whose significance is explored in Maw, 'Redemption and Retrospection'. The 'sweet circumstances' are the imperfect-to-perfect progressions from augmented second B♭/C♯ to major third A/C♯ to perfect fifth G/D. See Frobenius (ed.), *Johannes Boens* Musica, 67-68, 82, and 153-62. Paradoxically, the 'asperity' of the augmented second may not have been too hard to bear. The interval differs from the minor third in *just* intonation by the negligible distance of 2 well-tempered cents.

Here is a list of the awkward progressions in *Fumeux fume*. Syllables that do not feature such progressions are printed between square brackets. Eighth notes and eighth rests are not counted.

Fu[*meux*]	bb. 1-2 (A2: B♭-C♯) and 2-3 (A1: C♯-C);
fu[*me par fumée*].	4-5 (d3: b♭…F♯), 9-10 (A2: E-D♭, d5: B♮-F; A1: B♮-B♭), and 12-13 (A2: D♭-E)
Fumeu[*se*]	24-25 (A1: B♭-[C]-B♮)
spe-	28-29 (d3: B♭-G♯, A4: Γ-C♯; likewise 30-31, 32-33, and 34-35), and 29-30 (A5: C♯-F *grave*, pC: G♯-A♭; likewise 31-32 and 33-34)
cu[*lacion*].	39-40 (A2: F-G♯)

It is immediately apparent that the awkward progressions occur mostly on the first one or two syllables of each word; the remaining syllables are between square brackets. The exception is the long melisma on *par fumée* in bb. 15-23. It does not have the regular back-and-forth leaps between neutral, flat, and sharp areas (which is what creates the awkward moments) but retreats flatward in a steadily descending sequence.

To visualize this, let us represent each bar by one of three glyphs: ▫ for those that use only white keys (natural), ⬓ for those that use white and *lower* black keys (natural plus flat), and ⬒ for those that use white and *upper* black keys (natural plus sharp). Groups of bars that share the same syllable are demarcated by a vertical line of division |.

When there are two syllables within one bar, there will be a double vertical line || after that bar.

Fu-meux bb. 1-3: ◘▣|◘| *fu-me* 4-14: ◘▣◘◘□□◘◘◘□|□|
par fu-mé-e 15-23 □||◘◘◘◘◘◘◘◘◘|◘|.
Fu- meu- se 24-27 ◘|□|□□|
spe- 28-38 ◘▣◘□◘▣◘□◘□□ |
cu- la- ci- on 39-45 □▣□|◘|◘|□|

The awkward progressions listed earlier correspond to rapid alternations between the three glyphs. One can almost see one's fingers moving forward and backward on the integrated keyboard. The exception mentioned above, on *par fumée*, has no such alternation and is represented by an unchanging string of glyphs ◘.

This visualization makes it easier to tell why an exact rendition of *Fumeux fume* is feasible only on a keyboard like this, with three integrated rows of keys. The only alternative would be to use two keyboard instruments side by side. Yet it might be challenging to maintain pace while switching back and forth between two instruments in the up-tempo rendition called for by the rapid decay of sound. It might also be difficult to ensure smooth continuity when the general drift is rapidly downward (bb. 28-38) or upward (bb. 39-45).

Jacobus reports the existence of keyboards capable of performing major semitones (beyond the neighboring keys B♭ and B♮ that were playable already on the diatonic keyboard) and even Pythagorean commas and quartertones—the latter with the help of so-called *claves enormae* or *enharmoniacae*. Jacobus also reports that there are chromatic keyboards in which nearly all whole tones are split up into major and minor semitones. There can be no question that instruments of this kind were within the technical capabilities of the fourteenth century, which after all invented the chromatic keyboard and the mechanical church organ.

Nec claves, nec voces, nec signa sint ibi distinguendi minus semitonium in duas medietates, quamvis in instrumentis artificialibus, ut in organis, claves ad hoc habeantur quas enormas vocant.

There are no keys, no pitches, and no signs, to split the minor semitone into two halves, although artificial instruments like organs have keys for this purpose which they call *enormae*.

Speculum, II. xxxiv. 14

Licet regulariter apotome inter voces ipsius ♭ fa ♮ mi situm sit, per falsam tamen musicam in multis aliis locis potest reperiri, et tonus in duas inaequales partes separari, et hoc in multis instrumentis, specialiter in organis, observatur, ut tonus fundetur et consonantiae plures habeantur. Etiam claves ibi quaedam reperiuntur semitonium minus dividentes, quae enharmoniacae dicuntur.

Although the [major semitone] is situated, as a rule, between the pitches B♭ fa and B♮ mi, it is possible to find it in many other places and to divide the whole tone into two unequal parts with the help of *musica falsa.* And this can be observed on many instruments, especially organs, namely, that the whole tone is the foundation, and there are multiple intervals [within it]. One can even find certain keys that divide the minor semitone, which are called *enharmoniacae*.

Speculum, II. lxx. 14.

De semitonio maiore cum bis diapason aliquid breviter dicamus quamvis in monochordo, nisi falsa iuvemus nos musica, minime reperiatur. Secus est in aliquibus organis.

We will briefly say something about the major semitone plus double octave, even though it is not found on the monochord, unless of course we avail ourselves of *falsa musica*. But this is different on certain organs. *Speculum*, II. cxviii. 15

Dicendum igitur quod, etsi possibile sit ponere vocem mediam inter .A. primam et .B. secundam ibique dividere tonum in duo semitonia inaequalia, sicut in aliquibus instrumentis artificialibus fit, ut in organis, in quibus quasi ubique tonus in duo semitonia dividitur inaequalia ut ibi plures cantus possint fieri pluresque concordiae discantusque reperiri, non est tamen hoc utile quantum ad cantus vocis humanae.

It must be said, therefore, that although it is possible to notate a middle pitch between A and B, and to divide the tone into two unequal semitones (as happens in some human-made instruments such as organs, so that almost everywhere in the organ the whole tone is divided into two unequal semitones, and multiple songs can be played, and multiple concords and discants are found), this is of no use as far as the singing of the human voice is concerned.
Speculum, VI. lv. 7

Meanwhile, back in Holland, Johannes Boen was dreaming of a future in which such instruments might be invented one day…

Nam secundum diversitatem temporis et regionum multa nova et inaudita poterunt suboriri, sicut forte pronuntiatio commatis et trium semitoniorum minorum ac multorum similium, que, licet hactenus non audita sunt, forte tractu temporis per nova instrumenta et vocum habilitates posterius audientur.

For it will be possible for many new and unheard-of things to come about, according to the diversity of times and regions, such as, perhaps, the performance of the [Pythagorean] comma or of [an interval consisting of] three minor semitones, and of many similar things which in future, after some lapse of time, will perhaps be heard with new instruments and vocal abilities, even if they have not been heard up till now.
Frobenius (ed.), *Johannes Boens* Musica, 45.

Abstract

This article reviews the possibility that Jacobus, author of *Speculum musicae*, is identifiable with a certain Jacobus de Montibus who is mentioned as a music theorist in the late fourteenth-century music treatise of Goscalcus. The article also sheds light on the separate but related hypothesis that he is identifiable with a canon in Liège who is recorded there in the two decades after his appointment in 1316, and whose name was likewise Jacobus de Montibus.