MUSIC IN THE ARTS FACULTY OF PARIS IN THE THIRTEENTH AND EARLY FOURTEENTH CENTURIES

Gilles Rico
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D.Phil. Thesis
Trinity Term 2005

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Abstract

In the thirteenth-century, the city of Paris witnessed the birth of the University, the gradual penetration of the new philosophical paradigm of Aristotelianism and the emergence of a new theoretical discourse dealing with the measurement and notation of musical time. Scholars have attempted to find correlations between these three distinct phenomena. Focusing on music theory sources and on other indirect testimonies, they have never satisfactorily approached the central question of the teaching of music in the Arts faculty of Paris. The objective of the present study is precisely to explore this *terra incognita*. This exploration will take as a point of departure a multiplicity of hitherto unpublished sources, produced by the Parisian masters of Arts, likely to yield insightful information about the form and the content of the teaching of music in the Arts faculty of Paris in the thirteenth and early fourteenth centuries. It will be asserted that the teaching of music in the institution was confined to *musica* as an intellectual discipline. It involved commenting a textbook and discussing scholastic *questiones* about musical issues and was profoundly influenced by the gradual change of *epistemé* brought about by the study of Aristotelian natural philosophy. Reconstructing the nature and function of music teaching in the Arts faculty will lead to the reassessment of the role played by the institution in the developments of *musica mensurabilis*. It will be demonstrated that, contrary to what has been asserted, the University authorities do not seem to have fostered the cultivation of measured polyphony. Correlatively it will also be shown that influence of the Arts faculty and of its intellectual orientations on the elaboration and shaping of the theoretical discourse on rhythmic notation has been largely overestimated.

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ABBREVIATIONS

a) Printed documents

AcM	Acta Musicologica
AfM	Archiv für Musikwissenschaft
AHDLMA	Archive d'histoire et de doctrine littéraire du Moyen Age
AL	Aristoteles Latinus
ALPMA	*Arts libéraux et philosophie au Moyen Age. Actes du 4^e congrès international de philosophie médiévale* (Paris, 1969)
AUP	*Auctarium Chartularii Universitatis Parisiensis*, eds. H. Denifle and *al.*, 6 vols. (Paris, 1894-1966)
CM	Current Musicology
CS	*Scriptorum de musica medii aevi nova series a Gerbertina altera*, ed. E. de Coussemaker, 4 vols. (Paris, 1864-76; reprint, Hildesheim,1963)
CSM	Corpus scriptorum de musica
CUP	*Chartularium Universitatis Parisiensis*, eds. H. Denifle and E. Chatelain, 4 vols. (Paris, 1889-97)
EDFA	*L'enseignement des disciplines à la Faculté des arts (Paris et Oxford, XIII^e-XV^e siècles)*, eds. O. Weijers and L. Holtz (Turnhout, 1997)
EM	Early Music
EMH	Early Music History
EPTS	*L'enseignement de la philosophie au treizième siècle. Autour du Guide de l'Etudiant du ms Ripoll 109*, eds. C. Lafleur and J. Carrier (Turnhout, 1997)
GS	*Scriptores ecclesiastici de musica sacra potissimum*, ed. M. Gerbert, 3 vols. (St. Blaise, 1784; reprint. Hildesheim, 1963)
HMT	*Handwörterbuch der musikalischen Terminologie*, ed. H.-H. Eggebrecht (Wiesbaden, 1972-)
JAMS	Journal of the American Musicological Society
JM	Journal of Musicology
JMT	Journal of Music Theory
JRMA	Journal of the Royal Music Association
MD	Musica Disciplina
MTIS	*Music Theory and Its Sources*, ed. A. Barbera (Notre-Dame, 1990)
MuG	*Musik und die Geschichte der Philosophie und Naturwissenschaften im Mittelalter*, ed. F. Hentschel (Leiden, 1998)
PMM	Plainsong and Medieval Music
RBM	Revue Belge de Musicologie
RISM	Répertoire International des Sources Musicales
RM	Revue de Musicologie

b) RISM manuscript signatures

Manuscripts are quoted in the present study in accordance with the conventions established by the RISM committee in *RISM-Bibliothekssigel* (Munich, 1999)

A-A	ADMONT, Benediktinerstift
A-KN	KLOSTERNEUBURG, Augustiner-Chorherrenstift, Bibliothek
A-SF	ST-FLORIAN, Augustiner-Chorherrenstift, Bibliothek und Musikarchiv
A-Wn	WIEN, Österreichische Nationalbibliothek
B-BRs	BRUGGE, Stadsbibliotheek

B-Gu	GENT, Universiteitsbibliotheek
CH-Bu	BASEL, Universitätsbibliothek
CZ-Pnm	PRAHA, Národní muzeum
CZ-Pak	PRAHA, Knihovna metropolitní kapituly
D-B	BERLIN, Staatsbibliothek Preussischer Kulturbesitz
D-DS	DARMSTADT, Hessische Landes- und Hochschulbibliothek
D-EF	ERFURT, Wissenschaftliche Allgemeinbibliothek
D-ERu	ERLANGEN, Universitätsbibliothek
D-Kl	KASSEL, Landesbibliothek und Murhardsche Bibliothek der Stadt Kassel
D-KNd	KÖLN, Diözesan- und Dombibliothek
D-LEu	LEIPZIG, Universitätsbibliothek
D-Mbs	MÜNCHEN, Bayerische Staatsbibliothek
DK-Kk	KOBENHAVN, Det Kongelige Bibliotek
E-Bac	BARCELONA, Arxiu de la Corona d'Aragó
E-E	EL ESCORIAL, Biblioteca del Monasterio
E-Sc	SEVILLA, Biblioteca Capitular y Colombina
F-AUT	AUTUN, Bibliothèque municipale
F-CHRm	CHARTRES, Bibliothèque municipale
F-CO	COLMAR, Bibliothèque municipale
F-Pan	PARIS, Archives Nationales
F-Pa	PARIS, Bibliothèque de l'Arsenal
F-Pm	PARIS, Bibliothèque Mazarine
F-Pn	PARIS, Bibliothèque Nationale de France
F-Psg	PARIS, Bibliothèque Sainte-Geneviève
F-Ps	PARIS, Bibliothèque de la Sorbonne
F-TLm	TOULOUSE, Bibliothèque municipale
F-Sm	STRASBOURG, Bibliothèque municipale
GB-Cgc	CAMBRIDGE, Gonville and Caius College
GB-Cpc	CAMBRIDGE, Peterhouse College
GB-Cssc	CAMBRIDGE, Sidney Sussex College
GB-Ctc	CAMBRIDGE, Trinity College
GB-Gu	GLASGOW, University Library
GB-Lbl	LONDON, British Library
GB-Oas	OXFORD, All Souls College
GB-Obac	OXFORD, Balliol College
GB-Ob	OXFORD, Bodleian Library
GB-Occ	OXFORD, Corpus Christi College
GB-Omec	OXFORD, Merton College
GB-Onc	OXFORD, New College
GB-Otc	OXFORD, Trinity College
I-Fl	FIRENZE, Biblioteca Medicea Laurenziana
I-Fn	FIRENZE, Biblioteca Nazionale
I-IV	IVREA, Biblioteca Capitolare
I-Ma	MILANO, Biblioteca Ambrosiana
I-Pca	PADOVA, Biblioteca Antoniana
I-Rvat	ROMA, Biblioteca Apostolica Vaticana
I-Sc	SIENA, Biblioteca Comunale
I-TOD	TODI, Biblioteca Comunale Lorenzo Leoni
I-Vnm	VENEZIA, Biblioteca Nazionale Marciana
PL-Kj	KRAKOW, Biblioteka Jagiellonska
PL-Tu	TORUN, Bibliotheka Glowna Uniwersytetu Mikolaja Kopernika
US-Cn	CHICAGO (IL), The Newberry Library

INTRODUCTION

In the thirteenth century, the city of Paris witnessed the advent and development of a new centre of institutionalised learning, the University, the rise and growth of a complex and multifaceted phenomenon named Aristotelianism, and finally the emergence and rapid evolution of a theoretical discourse dealing with the measurement and notation of musical time known as *musica mensurabilis*. These three seminal phenomena mark the beginning of a momentous period in intellectual history as well as in the history of music. Because they all occurred in Paris at roughly the same time, it is indeed very tempting to find correlations or even causal determinations between on the one hand the innovations that occurred in the realm of music theory and practice, and on the other hand the gradual change of *episteme* brought about by the thorough study of Aristotelian philosophy under the aegis of the early University. The most obvious means by which to establish such links is to assume that *musica mensurabilis* was a university discipline that gave rise to lectures and formal examinations based on a prescribed textbook. Such an assumption poses a problem that has long been tickling the historical imagination of modern music scholars: the problem of the role music played in the University or, to be more precise, in the Arts faculty of Paris.

Indeed, music historians have been preoccupied with the way in which medieval universities contributed to musical life and learning. In a pioneering article written in 1921, Peter Wagner already emphasized the instrumental role of the University of Paris in the unprecedented theoretical developments that occurred in the French capital during the thirteenth and fourteenth centuries.[1] Following the path opened by Wagner, André Pirro concentrated on aspects of musical life in the institution, yet he avoided the question of the

[1] P. Wagner, 'Zur Musikgeschichte der Universität', *AfM*, 3 (1921), 1-4.

teaching of music.[2] Soon after the publication of these first articles on the subject, stronger links between the University of Paris, Notre-Dame polyphony and *musica mensurabilis* were proposed. In her monograph dedicated to the study of music in medieval universities, published in 1958, Nan Cooke Carpenter affirmed that there was 'overwhelming evidence' demonstrating that music as a practical discipline was, from the start, cultivated at the University of Paris. She saw in the quasi-mythic Notre Dame composers Leonin and Perotin two 'university officials' who 'taught music, publicly or privately to students of the university'.[3] In addition, Carpenter even suggested that a formal teaching of the new art of measured polyphony had made its way into the Arts curriculum: 'treatises on aspects of *musica practica* sprang from musical studies at the University of Paris […] attempting to solve the problem of a clearer system of notation […] and discussing the various forms of the new polyphony, *discantus*.' Thus, 'almost from its inception, the University of Paris [...] not only played a leading role in the development of [...] polyphony as well as of a corpus of musical theory to explain and interpret this multilinear music'.[4] Following Carpenter, Gordon Anderson spoke for his part of the 'great importance' of music at the University, while in his monumental study on the early motet Matthiasen also referred to university lectures on *musica mensurabilis*.[5] However, Carpenter's 'overwhelming' evidence is nowhere to be found. If most of the evidence she does gather brings forth interesting anecdotes on musical life in the University milieu, it eludes the question of the actual

[2] A. Pirro, 'L'enseignement de la musique aux universités françaises', *Mitteilungen der Internationalen Gesellschaft für Musikwissenschaft*, 2 (1930), 26-32 and 3 (1931), 45-56. For German and Central European universities, see the series of articles by Gerhard Pietzsch originally published between 1935-1942 and reprinted as *Zur Pflege der Musik an den deutschen Universitäten bis zur Mitte des 16. Jahrhunderts* (Darmstadt, 1971).

[3] N. C. Carpenter, *Music in the Medieval and Renaissance Universities* (Norman, 1958), 329. It is noteworthy that the *universitas* as a legal corporation of masters and students did not yet exist at the time of Leonin (*c*.1180). On Leonin's career see C. Wright, 'Leoninus, Poet and Musician', *JAMS*, 39 (1986), 1-35. On the birth of the University of Paris see the enlightening pages by S. Ferruolo, *The Origins of the University. The Schools of Paris and their Critics 1100-1215* (Stanford, 1985), 285-310.

[4] Carpenter, *Universities*, 54 and 329.

[5] G.A. Anderson, 'Paris', in *NG6*, XIII, 186 and F. Matthiasen, *The Style of the Early Motet* (Copenhagen, 1966), 35. Both are quoted in C. Page, *The Owl and the Nightingale. Music and Ideas in Medieval France 1100-1300* (London, 1989), 137-8.

teaching of music in the Arts faculty of Paris.[6] For instance, that English students welcomed King Henry III during his visit to Paris in 1254 *in gaudio et canticis* does not necessarily imply that they had received some musical training at the University.[7] In the same way, Christopher Page showed that Matthiasen's supposed lectures on polyphony were in fact based on his misunderstanding of a remark by the thirteenth-century Dominican music theorist Jerome of Moravia.[8]

Once these unfounded arguments propounding a university teaching of *musica mensurabilis* are dissolved, there remains a disquieting silence on the part of the official statutes of the institution. This documentary silence led the French historian Guy Beaujouan to speak of a 'two-hundred year eclipse' or even of a 'cessation' of music at the University of Paris.[9] Less categorically, Michel Huglo established a putative affiliation between the school of Chartres and the Parisian schools that congregated to form the University. From the famous *Heptateuchon* (*c*.1150) of Thierry of Chartres, which is presumed to best represent the Chartrian curriculum, Huglo inferred that the teaching of music at the Arts faculty was conducted with the most widely copied and disseminated musical text of the Middle Ages, Boethius' *De institutione musica*.[10] Furthermore, on the basis of a close scrutiny of the catalogues of medieval Parisian libraries, he hypothesized that several other 'ancient sources of music theory' (including Plato's *Timaeus*, Macrobius' *In somnium Scipionis* or Augustine's *De musica*) could have been used to supplement Boethius' treatise in the classrooms of the Arts faculty.[11] In short, Huglo proposed the following

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[6] In fact, a large majority of the musical references brought together by Carpenter are drawn directly from the earlier article by André Pirro.
[7] This event is described by Matthew Paris in his *Chronica Maiora*. See Carpenter, *Universities*, 65 and Pirro 'L'enseignement', 27.
[8] Page, *The Owl,* 238 n.18.
[9] G. Beaujouan, 'The transformation of the Quadrivium', in *Renaissance and Renewal in the Twelfth Century*, eds. R. Benson and G. Constable (Cambridge, 1982), 465.
[10] M. Huglo, 'L'enseignement de la musique à l'université de Paris au Moyen Age', in *L'enseignement de la musique au Moyen Age et à la Renaissance. Actes du colloque de Royaumont 1985* (Royaumont, 1987), 73-79; Id., 'L'enseignement de la musique dans les universités médiévales', in *Atti del XIV Congresso della società internazionale di musicologia Bologna 1987*, eds. A Pompilio and *al*. (Torino 1990), I, 30-7.
[11] M. Huglo, 'The Study of Ancient Sources of Music Theory in the Medieval Universities', in *MTIS*, 150-172.

reconstruction: the teaching of *musica* at the early University resembled that at the cathedral school of Chartres, was conducted with Boethius' *De institutione musica*, and was complemented with other ancient sources. Then, by the middle of the century, because of the introduction of Aristotle's widely influential *libri naturales* into the curriculum, *musica* fell into abeyance. Finally, a renewed interest for the discipline and for Boethius' text grew stronger at the beginning of the fourteenth century, an interest which eventually led to the elaboration of Johannes de Muris' *Musica speculativa*.

Huglo's premise is questionable. The works of Sir Richard Southern and the prosopographical inquiries of John W. Baldwin on the teaching personnel of the Parisian schools at the beginning of the thirteenth century have demonstrated that the schools of Chartres and Paris had very different educational orientations. The relatively small cathedral school of Chartres could certainly neither rival nor impose a curriculum on the numerous schools of dialectic and logic that made the fame of Paris in the twelfth century.[12] Even so, Huglo's hypothesis about a possible teaching of Boethius in the Arts faculty has been confirmed by Christopher Page who took as a point of departure for his inquiry another source well known to the historians of the universities, the *Compendium of Barcelona*.[13] Less optimistic than Huglo and Page, Max Haas denied the very possibility that music, before Johannes de Muris, was ever the object of lectures at the Arts faculty of Paris.[14] This is not the opinion of Olga Weijers who has provided the most complete and sound description to date of the place of music in the Arts faculty. Taking into account a recently

[12] R. Southern, 'The Schools of Paris and the School of Chartres', in *Renaissance and Renewal*, 113-135 and J.W. Baldwin, 'Masters at Paris from 1179-1215: a social perspective', in *Renaissance and Renewal*, 138-172.
[13] Two different versions of the section on music have been partly edited and succinctly studied by Page, *The Owl and the Nightingale*, 139-141 and 203-4; and by M. Haas, 'Studien zur mittelalterlichen Musiklehre I: Eine Übersicht über die Musiklehre im Kontext der Philosophie des 13. und frühen 14. Jahrhunderts', *Forum Musicologicum*, 3 (1982), 353-366. See also the acts of the congress on this important source for the history of the University of Paris published in *EPTS*.
[14] M. Haas, 'Les sciences mathématiques (astronomie, géométrie, arithmétique, musique) comme parties de la philosophie', in *EPTS*, 94-6.

edited body of literature emanating from the faculty, she reaffirmed the presence of Boethius' *De institutione musica* in the classrooms of the *Rue du Fouarre*.[15]

In parallel and sometimes in relation with these preoccupations about musical education at the early University of Paris, musicologists have also tended to associate the formidable blossoming of this institution with the emergence and unprecedented developments of a new theoretical discourse explaining, legitimising and justifying the advances in the praxis-oriented domain of polyphony. Though the idea of a formal teaching of *musica mensurabilis* in the Arts faculty, with all its institutional implications (ordinary lectures, examinations and other curricular prescriptions), no longer seems tenable, the possibility of an 'informal University teaching' of music theory remains an alternative fashionable among medieval musicologists.

In his recent edition of the different versions of Johannes de Garlandia's *Musica plana*, Christian Meyer sees in the scholastic rigour and the mathematical content of the text, characteristics that 'révèlent sans nul doute un enseignement universitaire'.[16] Elsewhere Meyer also describes the *Tractatus de consonantiis musicalibus* ascribed to Jacobus Leodiensis and the 'phantom' treatise of Philip of Vitry, the *Ars nova*, as *reportationes* of an oral teaching at the Arts faculty of Paris or in music schools linked to the University.[17] The 'informal teaching' hypothesis is in fact not limited to consonance or plainchant theory but also extends to *musica mensurabilis*. By linking Johannes de Garlandia's modal theory to the *modi significandi* of Parisian speculative grammar, Nancy Van Deusen explicitly posits *musica mensurabilis* as the offspring of the Arts faculty of Paris.[18] This is also the intent of Jeremy Yudkin when he speaks of the 'Notre-Dame school' of music theory or when he

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[15] O. Weijers, 'La place de la musique à la faculté des Arts de Paris', in *La musica nel pensiero medievale*, ed. L. Mauro (Ravenna, 2001), 245-262.
[16] Johannes de Garlandia, *Musica plana*, ed. C. Meyer (Baden-Baden, 1998), 130.
[17] C. Meyer, 'Le tractatus de consonantiis musicalibus' (CSI Anon. I, Jacobus Leodiensis alias de Montibus) : une *reportatio* ?', *RBM,* 49 (1995), 25-6. The complex problems raised by the textual tradition of Philippe de Vitry's so-called *Ars nova* have been treated in detail by S. Fuller, 'A Phantom Treatise of the Fourteenth Century? The Ars Nova', *JM*, 4/1 (1985-6), 23-50.
[18] N. Van Deusen, *The Harp and the Soul. Essays on Medieval Music* (Lewinston, 1989), 256-312.

qualifies the most important *musica mensurabilis* treatises of the thirteenth century as 'French University music texts'.[19] In the same vein, Michel Huglo describes Franco of Cologne's *Ars cantus mensurabilis* as a treatise addressed above all to the students of the Arts faculty of Paris, one written 'dans le style des sommes universitaires, à la demande de hautes personnalités, peut-être le recteur de la Faculté des Arts'.[20] Finally, the idea that a praxis-oriented music theory was taught within the framework of the University underpins Dorit Tanay's recent study on the intellectual context of rhythmic notation in late medieval Paris.[21]

To recapitulate, with the works of Huglo, Haas and Weijers, the role of music in the Arts faculty of Paris is no longer a complete *terra incognita.* Yet, the divergences between these scholars indicate that there are still points of contention. In addition, if the idea of a 'formal' teaching of polyphony and *musica mensurabilis* within the framework of the curriculum of the Arts faculty can now be discarded, it has been replaced by the idea of an 'informal teaching'. Although almost unanimously accepted by musicologists, this idea is in fact founded on nothing but arguments from silence and putative links established between music theorists and the University.

Thus, the problem of the role of music in the Arts faculty of Paris will not be solved until several important questions receive definite, and if possible, definitive answers. Did *musica* as an intellectual discipline form part of university education in Paris? If so, how was it taught? How did the content of this teaching and the interests of Parisian scholars evolve over time? What was the function of formal music instruction in the Arts faculty? Finally, did an 'informal teaching' of music theory ever take place at the University of Paris? In other words, did the University unofficially encourage the teaching of measured music and hence constitute a driving force in the developments of rhythmic notation?

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[19] J. Yudkin, 'The influence of Aristotle on French University Music Texts', in *MTIS*, 189.
[20] M. Huglo, 'Recherches sur la personne et l'œuvre de Francon', *AcM*, 71/1 (1999), 12 and 15.
[21] D. Tanay, *Noting Music, Marking Culture: The Intellectual Context of Rhythmic Notation (1250-1400)* (Holzgerlingen, 1999).

The major objective of this study is to frame answers to these important questions. Using largely hitherto unpublished material, we intend to cast a new light on the multifarious and still for the most part unknown role played by music in the Arts faculty of Paris. We will then concentrate 1) on the 'formal teaching' of music as an intellectual discipline in the Arts curriculum; 2) on the role of music in the other disciplines of the Arts faculty or in other scholastic activities; 3) and finally on the question of the informal teaching of *musica mensurabilis* at the University. Furthermore, as seen above, there tends to be an imbalance in musicological studies whereby musical instruction is treated as a monolithic phenomenon with little regard as to how it might have evolved over time. The intent of the present study is to contribute towards redressing this historical imbalance by advocating a diachronic and historically grounded approach. Such a diachronic view will inevitably include a measurement of the impact of the major philosophical trends and doctrinal evolutions in the Arts faculty on the teaching of music, be it formal or informal.

In order not to be swamped by primary sources, it is necessary to set up chronological boundaries. In the excavation of an archaeological site, certain strata of the soil corresponding to a specific lapse of time prove to be more promising than others and to yield a greater number of important and connected finds; similarly, in any given historical inquiry certain periods prove richer than others. The period covered by this study runs from the birth of the University of Paris in *c.*1200 to *c.*1350. Such chronological boundaries are in fact determined partly by the history of the University of Paris, partly by the source material available, and partly by the history of music theory. The period 1200-1350 is often considered the Golden Age of the University of Paris. It predates the foundations of new universities in Central Europe and it ends with the works of such important figures as Johannes Buridan, Nicolas Oresme, Albert of Saxony and Marsilius of Inghen – figures, along with their English predecessors William of Ockham, Thomas Bradwardine and the

other Mertonians, who best incarnate the *via moderna* of fourteenth-century philosophy.[22] The period 1200-1350 is also one of the most crucial from the standpoint of music theory. It witnessed the outbreak and development of *musica mensurabilis* and finally the consecration of the *ars nova*, a convenient term grouping the new notational theory and practices which emerged at the beginning of the fourteenth century and which allowed for a more far-reaching and less ambiguous codification of musical time than had been possible before. In addition, if prior to 1350 a great deal of the innovations in the realm of music theory can be located in Paris, after that date, music theory seems to have flourished rather in Italy and in England.

In positing chronological limits, it is fruitful to mention briefly several problems that arise when dealing with medieval sources and more particularly with university and music theory sources. Problems of dating and origin constitute a major hindrance to any diachronic approach such as the one advocated in the present study. Most of the sources that were consulted lack a precise date and origin. If the origin and date of a particular manuscript can be ascertained more or less accurately with the help of palaeography, locating the original text both geographically and chronologically is more difficult and always remains the subject of controversy. In addition, issues of dates and origins are exacerbated by the fact that a shroud of anonymity covers most of the primary sources used in this study. Either the texts are anonymous or they are ascribed to shadowy figures about whom nothing is known other than their name. Ironically, where it has become extremely fashionable among literary critics to commit the ritual 'murder of the Author', any historical study of the medieval universities would gain much insight if it were possible to reinstate, despite the secretive nature of the sources, the tutelary presence of the Author.

[22] For a good overview of this *via moderna* in logic and natural philosophy see A. De Libera, *La philosophie médiévale* (Paris, 1995), 421-449. See also the articles collected in *Studies in Medieval Natural Philosophy*, ed. S. Caroti (Florence, 1989) and in *La nouvelle physique du 14^e siècle*, eds. S. Caroti and P. Souffrin (Florence, 1997).

These preliminary remarks are pertinent because the present study focuses for the greatest part on hitherto unpublished material. As will become apparent, questions of dates, authorship and provenance appear between the lines of the following pages. Because each type of primary source is characterised by its specific problems and displays a distinctive pattern of testimonies about the role of music in the Arts faculty, each of the five chapters of this study will concentrate on a specific type of source. Each type of source can be seen as the facet of a prism whose shape changes over time and through which we can reconstruct the fluctuations of a beam of light unfortunately inaccessible to us. Up until now, modern scholars have concentrated on but one of these facets and have equated the beam of decomposed light that comes out through this facet with the white light that originally entered the prism. Yet because the edges of this facet were not clearly outlined, and because the other facets of the prism remained obscured, it was impossible to analyse the spectral fluctuations in each shaft of decomposed light coming out of the prism and hence to reconstruct the beam of light that entered it. The present study aims to reconstruct that light while taking into account that there are probably still other facets of the prism to uncover, and that there will always be unfilled gaps in the spectrum of reconstructed light.

The relatively familiar facet of the prism comprises such sources as the statutes, the examination compendia, such as the *Compendium of Barcelona*, and other tracts that constitute what is now regarded as the 'introductory literature' of the Arts faculty.[23] Some of these sources have been at the centre of the most recent inquiries (notably by Haas and Weijers) into the role of music at the University. In Chapter 1 of the current study, these sources will be complemented with unpublished texts of a similar kind as well as with other tracts that could have been used as basic teaching material for university lectures on music. Thus the official statutory documents will be reinterpreted with the aid of this new material.

[23] For an overview of this introductory literature see the works of Claude Lafleur and particularly his article 'Les textes "didascaliques" ("introductions à la philosophie" et "guides de l'étudiant") de la faculté des Arts de Paris au XIIIe siècle', in *EDFA*, 345-372.

The form, content and function of the teaching of music in the Arts faculty of Paris will be approached, whenever possible, from a diachronic perspective.

Another facet of the prism, one contiguous to the first, will form the focus of attention in Chapter 2. Other traces of a possible formal teaching of music in the Arts faculty will be explored in the marginal glosses of the treatise often regarded as the textbook of musical instruction, Boethius' *De institutione musica*. If the exegetical tradition of this treatise is well documented prior to 1200, the thirteenth and fourteenth centuries constitute a neglected episode in the history of its reception. Yet there exist several anonymous sets of glosses on the treatise, all unpublished, and for the most part unstudied. In each of these sets of marginalia, the levels of both stasis and change in relation to former exegetical traditions will be scrutinized with a view to contextualising departures and innovations within the broader intellectual framework of the Arts faculty of Paris. Particular attention will be paid as to how the authority of Boethius was juxtaposed with that of Aristotle and how exegetes provided original solutions to reconcile the antagonistic systems of thought of the two authors. The main objective of this chapter will then be to unveil a reading of the treatise typical of the philosophical orientations of the Arts faculty and thus to determine whether some of the thirteenth- and fourteenth-century sets of marginalia on the *De institutione musica* can be considered records of actual lectures on the treatise.

There is yet another facet of the prism that has hitherto remained unexplored. To fully appreciate the place and the role played by music in the official curriculum of the Arts faculty, one needs to leave the teaching on the discipline itself to focus more on musical references in other disciplines of the Arts faculty. Since the teaching in these 'other disciplines' was founded on the commentary of the works of Aristotle, a systematic survey of musical references in Parisian commentaries on the Aristotelian corpus, for the most part unpublished, will constitute the core material in Chapter 3. It will be shown that certain textual loci in the Aristotelian corpus triggered specific scholastic discussions about music.

These discussions will be analysed for their own sake as well as with regard to what they might reveal about the content of the teaching of music in the Arts faculty.

Working with medieval sources always leads to unexpected discoveries. The systematic survey carried out in Chapter 3 uncovers hitherto unnoticed scholastic questions about music, thus bringing to light yet another facet of the prism that will be at the centre of Chapter 4. Contrary to the musical questions in Aristotelian commentaries, these new questions do not generally aim at elucidating issues raised by a text commented upon. Instead they deal with specific music problems that will be analysed in detail and related not only to what has been so far adumbrated about music in the Arts faculty, but also with contemporary music theory. Since the *questio*-form also appears at that time in music theory treatises, one section will be devoted to the elucidation of the role and implications of such a scholastic feature. It will be especially interesting to determine the academic function of all these musical *questiones* and notably whether they can be seen as *reportationes* of actual disputations or whether they are simply tracts couched in the then habitual mode of expression of the scholastic *questio*.

Having delineated the scope and content of the formal teaching of music as well as the role of music in other disciplines and academic activities of the Arts faculty, in Chapter 5 the last facet of the prism to be unveiled will concern the crucial question of the 'informal teaching' of music. Because many theoretical treatises dealing with practical matters such as *musica mensurabilis* can be directly or indirectly linked to the university, this question is indissolubly bound to the larger issues of musical practice at the University and of the institutional context for *musica mensurabilis*. Where then, within the teaching of the Arts faculty of Paris, can we situate the great treatises on *musica mensurabilis* of the thirteenth and fourteenth centuries? Was the institution instrumental in the tremendous developments of measured music?

To search for answers to this difficult question, this final chapter will take as a point of departure hitherto unexplored aspects of musical life and instruction at the University and in the colleges which flourished in thirteenth- and fourteenth-century Paris. Reconciling theory and practice, we will see whether the Arts faculty set up a favourable institutional context that may have prompted the tremendous developments of measured music. We will then turn to the theoretical treatises traditionally seen as emanations from the university circles. These treatises will not be envisioned as repositories of practical ideas about musical performance but rather as products of a definite intellectual milieu, devised in response to the needs of a specific audience. In order to confirm or invalidate the hypothesis of an informal teaching of music theory within the framework of the University, it will be fruitful to ferret out formal, terminological and philosophical features of the music treatises that stem directly from the teachings of the Arts faculty. This will not only illuminate important aspects of musical instruction in late medieval Paris but also lead to a reassessment of the role played by the Arts faculty in the elaboration of the new terminology for explaining, legitimising and justifying the advances in the domain of *musica mensurabilis*. In analysing this last facet of the prism, we hope to include the realm of musical performance practice into the spectrum of our inquiry on the role of music at the Arts faculty of Paris.

In short, this study aims to cast light on and dissipate misconceptions about the teaching of music at the Arts faculty of Paris in the thirteenth and early fourteenth centuries. Focusing on mostly unpublished sources from this institution, it will be shown that music had an assigned place in the academic curriculum, a place confined to the speculative branch of the discipline but not to the practical ones. For the first time, the elusive nature and function of music teaching at the University of Paris will be inferred and described in detail from this myriad documentation. Exploring the musical curriculum based on such a perspective will also lead to a reassessment of the influence of the Arts faculty and its

intellectual orientations on the momentous upheavals which occurred during this period in the domain of rhythmic notation.

CHAPTER 1

TEACHING MUSIC AT THE ARTS FACULTY OF PARIS: A RE-APPRAISAL

The unprecedented wave of translations from Greek and Arabic in the twelfth and thirteenth centuries drastically changed the topography of knowledge in the Latin West. Numerous treatises transmitting Greek and Arabic lore in natural philosophy, medicine, mathematics and alchemy were translated by scores of translators active on the fringes of Christendom (Spain and Sicily). The entire Aristotelian corpus gradually became available to Latin thinkers.[1] The impressively coherent system of nature propounded by Aristotle transformed and eventually superseded the dominant philosophical paradigm of Christian thought, Platonism. The arrival of the new texts nurtured a transformation in the topography of knowledge. The ancient schema of the seven liberal Arts which organised medieval *epistemé* was discarded. The model was no longer adequate. Different fields of knowledge were then reorganized according to various taxonomies, mixing old and new elements.

Schemes of classification multiplied on the fertile soil of the Arts faculty of Paris where Aristotelianism or, should we rather say Aristotelianisms, flourished.[2] Almost all of these classifications preserved the old *quadrivium* schema (comprising arithmetic, music, geometry and astronomy) now renamed *mathematica*. In accordance with Aristotle, *mathematica* was placed between natural philosophy and metaphysics to constitute theoretical or speculative philosophy. *Musica*, as part of *mathematica*, was above all conceived of as a speculative discipline. As such it participated in the *bios theoretikos*, which soon became the ideal of life for the Parisian masters of Arts. Theoretically, the true philosopher was bound to learn all the disciplines of speculative philosophy including music

[1] See F. Van Steenberghen, *Aristotle in the West. The Origins of Latin Aristotelianism* (Louvain, 1955).
[2] For the different classifications of science in the Arts faculty, with an extensive bibliography, see O. Weijers, *Le maniement du savoir. Pratiques intellectuelles à l'époque des premières universités (13^{e}-14^{e} siècles)*, (Turnhout, 1996), 187-197.

to reach a state of mental felicity.[3] But was this the case in practice? Was *musica* really taught at the Arts faculty of Paris? And if so, how?

The present chapter will broach the subject from two complementary points of view: the point of view of the form and the point of view of the content of this teaching. Were there music lectures at the Arts faculty of Paris? When, where, how often did music lectures take place? Which textbooks were used? Did the form of music lectures change over time? These are questions that will be addressed in the first part of this chapter. Their answers will be essentially sought in the existing statutory documents from the University of Paris. Since the statutes give only a biased and fragmentary view of academic reality, complementary information will also be sought in other types of sources. After having outlined the form of music instruction at the Arts faculty of Paris, the second part of the chapter will concentrate on sources of a more practical nature that could well represent traces and testimonies of musical instruction. Scrutinizing these traces will constitute a first step towards drawing a clearer picture of the variegated content and function of the teaching of music at the Arts faculty of Paris.

Before wading into the heart of the matter, it will be useful to recall a few generalities about the Arts faculty of Paris. Rather than focusing on the evolution or the political role of the institution, this short description will concentrate on the most recent research concerning on the one hand academic regulations, and on the other hand the social and material reality of student life.

Already during the formative period of the University of Paris, (*c*.1150-1210), the 'Arts schools' (a synecdoche for 'schools of dialectic') proliferated on the Ile de la Cité and the banks of the River Seine inciting both the ire of critics and the praise of enthusiasts.[4] In

[3] See notably L. Bianchi, 'La felicità intellettuale come professione nella Parigi del duecento', *Rivista di filosofia*, 78/2 (1987), 181-201.
[4] Several eulogies and vilifications of the schools are analysed in S. Ferruolo, *The Origins of the University. The Schools of Paris and their Critics 1100-1215* (Stanford, 1985).

the thirteenth century, the schools of Arts moved to the Clos de Garlande (*Garlandia*) on the Left Bank and more particularly to the Rue du Fouarre (*Vicus straminus*) in the present Latin Quarter.[5] The term *facultas artium* does not appear before the middle of the thirteenth century but what it stands for is probably as old as the University itself.[6] Despite the fact that the Arts faculty was supposedly propaedeutic to the higher faculties of medicine, law and theology, as the largest grouping of the University it soon became the most prominent. At the beginning of the thirteenth century, the students and masters of Arts represented a large majority of the University population which, according to most scholars, numbered around ten per cent of the global population of Paris estimated between 25,000-50,000.[7] Even with a remarkable demographic growth in the course of the thirteenth century, the population of the University of Paris did not expand accordingly. While historians estimate the population of Paris to have been between 80,000-200,000 at beginning the fourteenth century,[8] a financial document for a university *collecta* in 1329 records that the University comprised between 3000 and 3500 members, 2800 to 3300 of whom were members of the Arts faculty.[9]

This large academic population of the Arts faculty was divided up into four 'nations': the French nation, the Picard nation, the Norman nation and the Anglo-German nation.[10] In fact, only the English nation was truly international comprising students and masters mostly from the British Isles and Germany, but also from Hungary, Poland, Bohemia and Scandinavia. The 'multi-nationalism' of the Parisian University must not then be equated with 'internationalism'. Prosopographical research carried out on the

[5] A. Gabriel, *Garlandia. Studies in the History of the Medieval University* (Frankfurt, 1969), 54.
[6] O. Weijers, *Terminologie des universités* (Rome, 1987), 52-4.
[7] See J. Baldwin, *Masters, Princes and Merchants: The Social Views of Peter the Chanter and His Circle* (Princeton, 1970), I, 72.
[8] For various estimates see R. Cazelles, *Nouvelle histoire de Paris. De la fin de Philippe Auguste à la mort de Charles V* (Paris, 1972), 398-403.
[9] This collecta has recently been edited and analysed by W. Courtenay, *Parisian Scholars in the Early 14th Century* (Cambridge, 1999).
[10] For a general account on the system of nations in medieval universities, see P. Kibre, *The Nations in the Medieval Universities* (Cambridge, 1948).

aforementioned document from 1329 indicates that foreign scholars at the University of Paris populated almost exclusively the higher faculties. The overwhelming majority of the members of the Arts faculty came from the diocese of Paris and from the surrounding archdioceses of Sens, Reims, Rouen and Tours. Far from being an international humanistic centre of learning as was previously thought, the Arts faculty was first and foremost a regional institution.[11]

Coming to Paris from a neighbouring diocese or from further away, a prospective Arts student had to fulfil two conditions: be a tonsured clerk and have a master. Usually, the student and his master came from the same region.[12] But their relation extended beyond geographical or academic bonds. Numerous names of masters in the *collecta* of 1329 are associated with anonymous *socii, scolares*, *artistae*, *grammatici* or *pueri* living under the same roof.[13] Therefore, most of the time, a master was responsible for a residential unit that he rented or owned, and his fellow boarders were his students. Thus, the master provided not only educational supervision but also, *in loco parentis*, moral guidance.[14] Such guidance was needed because the population of the Arts faculty was young and undisciplined, as the countless incidents involving ribald and wanton students as well as the numerous disciplinary regulations issued by ecclesiastical authority attest. According to the statutes, the minimum age to become a master was 20-21.[15] The minimum length of study was six years in 1215 and it gradually dropped to three years by the middle of the fourteenth century. Therefore the students started their Arts course around the age of 14-15 or later.

At the Arts faculty of Paris, a student had to go through three examinations to become an active master: the *determinatio* or baccalaureate which was less an assessment of

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[11] Courtenay, *Parisian Scholars*, 107-123.
[12] See M. Tanaka, *La nation anglo-allemande de l'Université de Paris à la fin du Moyen Age*, (Paris, 1991), 176-79.
[13] See the many examples of masters living with their students in Courtenay, *Parisian Scholars*, 218-246.
[14] On the moral duties of the master see A. Gabriel, 'The Ideal Master of the Medieval Universities', *The Catholic Historical Review*, 60/1 (1974), 24-35.
[15] See notably *CUP*, I, nos. 20 [*a.* 1215] and 202 [*a.* 1252]; *CUP*, II, no. 1185 [prior to 1350].

knowledge than a test of the practical abilities of the candidate to direct the academic exercise *par excellence*, the disputation; the *licentia* during which the candidate was examined by a jury composed of four masters (one from each nation) and the Chancellor either of Notre-Dame Cathedral or of the Abbey of Sainte-Geneviève; and finally the *inceptio* which notably comprised a solemn inaugural disputation marking the entry of the new licentiate into the corporation of masters.[16]

It is important to keep in mind that these three examinations (*determinatio*, *licentia* and *inceptio*) incurred huge costs. The candidate for the examinations at the Arts faculty of Paris had to pay 1) a fee for each examination that amounted to five *bursae* (i.e. five times his weekly expenditure excluding lodging); 2) an administrative fee *pro sigillo* to the nation; 3) a fee to the examiners for the determination and the licence; 4) an outlay to his master for presenting him for each examination and another sum for renting the latter's school for the disputations of the determination; 5) finally, the expense for lavish banquets after the examinations. On top of examination expenditures, student life in Paris entailed other costs: board, lodging, clothes, travels, honorarium for the master, writing material (ink, parchment, wax tablets, etc.), books, the annual fee paid to the nation, university *collectae* and other incidental expenses (fines for misconduct, taverns and even brothels, etc.). Although certain practices could alleviate the financial weight of studying in Paris (e.g. the *subdeterminatio,* exemption of *collectae*), they were neither systematic nor consistent.[17] The famous XVIIIth Canon of the Third Council of Lateran (1179) which guaranteed a free schooling for the poor was in fact limited to spiritual and moral instruction. Education in the Arts faculty was never free. In his *Summa* written between 1208-1213, the Parisian Theologian Robert of Courson affirmed that 'de magistris artium quod intuitu eorum que spiritualia uel moralia

[16] The main statutes regulating the examinations are *CUP*, I, nos. 20, 202, 461, 485, 501; *CUP*, II, no. 1185; *CUP*, III, no. 1319. For a recent and very complete account on the examinations at the Arts faculty see Weijers, *Le maniement*, 116-127.

[17] On the *subdeterminatio* see Tanaka, *La nation anglo-allemande*, 125-140 and on the conditions of exemption for university *collectae*, see Courtenay, *Parisian Scholars*, 31-33.

non sunt, possunt locare operas suas et accipere collectas'[18]; there was no exception for the poor students of the University of Paris.

Many a poor student who could not match the heavy costs entailed by university life was forced to forgo his course. In fact a majority of the students never finished their course probably for that reason. The extensive documentation of the Anglo-German nation in the fourteenth century indicates that the drop-out rate approximated over 70%.[19] While in Paris, the poor student had to count upon the uncertain aid and alms of others. Another alternative was to find odd-job employment. Some students became distributors of Holy water, servants for wealthy students or colleges, scribes, elementary school teachers, private tutors or secretaries.[20] Music also constituted a possible source of income. Students with a good voice could sing for cash in hand at parish churches, for the recreation of other clerks or even perhaps for University celebrations.[21] No doubt this may also have led some students to flirt with minstrelsy. In an anonymous thirteenth-century poem, the *Dit du jongleur*, the main character renounces the pursuit of his studies at the Arts faculty of Paris to become a minstrel, selling his books 'et cels [i.e. the books] d'Art et cels de Fisique, et mes conduis et ma *Musique*'.[22] The *Musique* that the narrator left in Paris with his book of conductus – a musical and poetic genre particularly prized by the intellectual elite of the clergy – when he abandoned his studies for a more lucrative career as a professional entertainer, is certainly a book of music theory, perhaps a book he studied at the Arts faculty.[23] Thus, at the end of

[18] Robert of Courson, *Summa*, F-Pn lat. 3258, fol. 67va.
[19] See the statistical data given in Tanaka, *La nation anglo-allemande*, 265.
[20] Various examples are compiled by J. Paquet, 'Coût des études, pauvreté et labeur: fonctions et métiers d'étudiants au Moyen Age', *History of the Universities*, 2 (1982), 15-52.
[21] See Paquet, 'Coût', 28-9; A. Pirro 'L'enseignement de la musique aux universités françaises', *Mitteilungen der Internationalen Gesellschaft für Musikwissenschaft*, 2 (1930), 29.
[22] Anonymous, *Dit du Jongleur* quoted in M. Haas, 'Studien zur mittelalterlichen Musiklehre I: Eine Übersicht über die Musiklehre im Kontext der Philosophie des 13. und frühen 14. Jahrhunderts', *Forum Musicologicum* 3 (1982), 374.
[23] In medieval library catalogues, *libri de musica* usually refers to books of music theory (more often treatises by Boethius or Guido of Arezzo) whereas *libri de cantu* implies books containing music. See for instance the medieval catalogues of the Benedictine monastery of Fleury in G. Becker, *Catalogi bibliothecarum antiqui* (Bonn, 1885), nos. 79 and 136.

this brief introduction, the *Dit du Jongleur* brings us back to the heart of the matter: the teaching of music at the Arts faculty of Paris.

The Form of Music Teaching

Reinterpreting the Statutes

In order to determine whether or not a discipline was part of the official curriculum of study at the University of Paris in the thirteenth and early fourteenth centuries, the first step to be taken is to browse through the statutory documents that regulated the functioning of the institution. As it is well known, the dearth of such documentation hinders any precise description of the Arts curriculum.[24] The oft-quoted statutes promulgated in 1215 by the Cardinal Legate Robert of Courson represent the first surviving document concerned with the internal organisation of the curriculum in the Arts faculty of Paris.[25] The section of the document dealing with the organisation of the curriculum is threefold. The Cardinal Legate first reiterates the ban of 1210 prohibiting lectures on Aristotle's natural philosophy, metaphysics and on any other texts based on their contents (*summe de eisdem*).[26] He then describes the primary curriculum which constitutes the backbone of the Arts teaching. It comprises the *dialectica nova et vetus* (chiefly the entire corpus of Aristotelian logic), Priscian's *Institutiones grammaticales* and other grammatical texts. These texts, as the statutes specify, must not be read *ad cursum*. Lectures *ad cursum* at the University of Paris usually were given by bachelors in the afternoon. They consisted of a brief literal exposition

[24]See for instance P. Kibre, 'The Quadrivium in the Thirteenth Century Universities', in *ALPMA*, 175; G. Beaujouan, 'Le quadrivium et la faculté des Arts', in *EDFA*, 185; and more recently O. Weijers, 'La place de la musique à la faculté des Arts de Paris', in *La musica nel pensiero medievale*, ed. L. Mauro (Ravenna, 2001), 245-248.
[25] *CUP*, I, no. 20.
[26] On this much-commented passage and its implications, see the revised interpretation given by L. Bianchi, *Censure et liberté intellectuelle à l'université de Paris (13^{e}-14^{e})* (Paris, 1999), 92-6.

of the text studied, as opposed to the ordinary lectures delivered by the masters in the morning, during which the issues raised by the text were analysed in detail.[27]

Finally and of greater importance here, Courson sketches a secondary teaching program that encompasses various textbooks and disciplines of lesser importance to be read on the numerous feast days (*dies festivi*) that punctuated the academic year. The surviving calendars of the University (all from the fourteenth century) indicate that some feast days bore the mention *non legitur*.[28] On very solemn feasts (e.g. Christmastide, Eastertide, Pentecost, Trinity and other celebrations) all lectures were suspended. There remained however around sixty other feast days when the secondary teaching could have taken place. This secondary curriculum comprised lectures on the *quadrivium* (*quadruvalia*), on the 'philosophers', on the *Barbarismus* (i.e. the third Book of Donatus' *Ars maior*), on rhetoric treatises (including the Fourth Book of Boethius' *De differentiis topicis* about the relation between logic and rhetoric), and finally on Ethics.[29]

The expression *quadruvalia* is rather vague and unusual. It does not indicate whether all four canonical disciplines of the *quadrivium* (arithmetic, music, geometry, astronomy) had to be read on feast days or whether attendance at lectures on one or two disciplines was sufficient. The vagueness of the term led Max Haas to suggest that it did not, in fact, include music. As a consequence, he affirmed that music was not part of the early university curriculum and that it only became the subject of lectures at the Arts faculty of Paris when Johannes de Muris wrote his *Musica speculativa* in 1323-5.[30] As we shall see below, the *quadruvalia* of the Courson statutes included *musica* which then had to compete with the rest of the secondary disciplines to be taught on feast days.

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[27] On the differences between ordinary and *ad cursum* lectures, see A. Maierù, 'Les cours: lectio et lectio cursoria d'après les statuts de Paris et d'Oxford', in *EDFA*, 373-391.

[28] The calendar of the English nation is edited in *AUP*, I, 1-11; and the one of the Picard nation can be found in *CUP*, II, no. 1192.

[29] *CUP*, I, no. 20: 'non legant in festivis diebus nisi philosophos et rhetoricas, et quadruvalia et barbarismum, et ethicam, si placet, et quartum topichorum.'

[30] Haas, 'Studien', 353, 367-8, and 414; Id., 'Les sciences mathématiques (astronomie, géométrie, arithmétique, musique) comme parties de la philosophie', in *EPTS*, 95.

Because the Courson document is the first and, in fact, the only official text from the thirteenth century to mention the *quadruvalia*, modern scholars have assumed that the mathematical disciplines and hence music disappeared from the curriculum in the course of the century, crowded out by Aristotle's natural philosophy.[31] This opinion indeed finds strength and support in the famous statutes adopted in 1255 by the members of the Arts faculty in which the *libri naturales* appear *en masse*. These later statutes regulate the mode of lecturing for each textbook and fix a minimum amount of time that should be imparted to their study.[32]

Yet, contrary to what has been asserted, the absence of the *quadrivium* in general and of music in particular in this seemingly exhaustive and thoroughly charted educational program should not be interpreted as a sign that these disciplines had, by the middle of the century, disappeared from the intellectual and institutional horizons of the Arts faculty. One must not forget that these statutes were issued not so much to describe the implementation of a new curriculum but rather to ensure that each prescribed textbook was given a time duly proportionate to its importance and complexity. Because the teaching on feast days had been codified forty years earlier it was unnecessary to reiterate what had already been prescribed. In fact, the absence of the *quadrivium* in the 1255 statutes offers an argument *ex silentio* indicating that nothing had changed since the Courson statutes in 1215. Thus, rather than a putative secession of the *quadrivium* and of music which would have occurred between 1215 and 1255, it would be more appropriate to speak of an unbroken continuity.

Two documents might be brought forth to contradict this position. First an oft-quoted remark by Roger Bacon, who in his *Opus minus* of 1267, stated that at the time when Alexander of Hales was a master of Arts, prior to his entry into the Franciscan order

[31] This is the opinion of M. Huglo, 'The Study of Ancients Sources of Music Theory in the Medieval Universities', in *MTIS*, 172; see also J. Dyer, 'Chant Theory and Philosophy in the Late Thirteenth Century', in *Cantus Planus IV. IMS Study Group* (Budapest, 1992), 101-8.
[32] See *CUP*, I, no. 246.

(*c.*1220-30), mathematical sciences, in addition to optics, moral science, alchemy and what he called *scientia experimentalis*, were not practised in the Parisian *studium*.[33] The second document is a statute of 1252 from the English nation of the Arts faculty of Paris regarding the examination of the *determinatio*. To take the examination of the determination, the candidate must have attended a certain number of ordinary and cursory lectures on the same logical and grammatical textbooks as the ones listed in the statutes of 1255. There is neither mention of the *libri naturales* apart from the *De anima,* nor of the *quadrivium* and the other feast-day disciplines.

Firstly Bacon's remark should not be taken at face value. In the introduction to the *Opus minus*, dedicated to Pope Clement V, Bacon intends to show the flaws of previous educational systems, and to emphasize and bolster the novelty of the reform he proposes. He purports to demonstrate that all Christian thinkers could benefit from the five neglected sciences at the core of his own educational endeavour. Knowing his motivations, his legendary propensity to brag and exaggerate, as well as the fact that in the 1220s he was still in swaddling clothes, how are we to trust the testimony of this *doctor mirabilis*? Secondly, that neither Aristotle's natural philosophical works nor the *quadrivium* are mentioned in the 1252 statute does neither imply that the former had not yet entered the curriculum nor that the latter had disappeared from it. If these texts and disciplines are not mentioned, it is perhaps because they were not required for the examination of the *determinatio* itself but for the subsequent examination, the *licentia*.

Two later documents from the fourteenth century confirm this hypothesis. According to a record dated from the first half of the fourteenth century, all candidates for the licence at Sainte-Geneviève had to pledge that they had attended lectures on 'at least one hundred lectures on mathematics' or, according to a later addition, that they had studied one

[33] 'Et iterum hoc, quia studium Parisiense adhuc non habuit usum istarum quinque scientiarum [mathematicae, perspectiva, scientia moralis, alkimia, scientia experimentalis]' (Roger Bacon, *Opus minus*, ed. J. S. Brewer [London, 1854], 327). See also Kibre, 'Quadrivium', 179; and Haas, 'Studien', 357.

mathematical book in its entirety and that they were currently studying another one.[34] Similarly, the statutes of the Arts faculty from 1366 specify that to be eligible for the licence examination either at Notre-Dame or at Sainte-Geneviève, all candidates had to swear that on top of lectures on each of the *libri naturales* they had also attended lectures on 'certain mathematical books' (*aliquos libros mathematicos*).[35]

The conditions charted here for the licence examination are echoed in unpublished model *commendationes* or 'inception speeches' from the Arts faculty of Paris transmitted in F-Pn lat. 16089 (fols. 134ra-141va).[36] In one such speech, while praising the candidate who incepted under his supervision, the master incidentally describes the latter's academic progression:

> Dominus vero R. sub me sui gratia incepturus perfectus est virtutibus moralibus […]. Similiter perfectus est virtutibus intellectualibus […] Quoniam primo audivit grammaticam que preparat aliis scientiis linguam, ut dicit Al Farabi in logica sua, deinde logicam que docet modum inquirendi ignotum in aliis scientiis, iuxta Philosophum II Metaphysice. Deinde quidem audivit mathematicas scientias et praeter has, naturales, post quas vero morales, post morales vero scientiam divinam, iuxta consilium Philosophi VI Ethicorum.[37]

As a mathematical science, music was then studied after logic and before natural philosophy in conformity with Aristotle's educational ideal. The curriculum outlined here is certainly covered by a veneer of idealism due to the kind of performative rhetoric attached to graduation speeches. In practice, no doubt, more flexibility was allowed; the sciences of language were studied during a first stage and it is quite probable that mathematics, natural philosophy, metaphysics and ethics were all studied more or less simultaneously during a second stage.

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[34] 'Item quod audivistis centum lectiones de mathematica ad minus. Istud per facultatem sic est interpretatum quod sufficit audivisse unum librum totalem mathematice; sicut tractatum *De spera*, et alium librum actu audire cum spe audiendi usque ad finem sine fraude.' (*CUP*, II, no. 1185).
[35] *CUP*, III, no. 1359.
[36] These *commendationes* can be dated from the late thirteenth or early fourteenth century. A quotation from Themistius' paraphrase on the *De anima* (fol. 134ra), translated by William of Moerbeke in 1267, provides a secure *terminus post quem*.
[37] F-Pn lat. 16089, fol. 136va.

It is noteworthy that the fourteenth century documents adduced here substitute for the traditional *quadrivium* the more Aristotelian term *mathematica*, found notably in Aristotle's tripartition of theoretical philosophy into *philosophia naturalis*, *mathematica* and *philosophia prima* or *metaphysica*. Does this substitution indicate an evolution in the teaching of mathematics at the Arts faculty? According to Johannes de Jandun writing in 1323, the Arts school of the *Rue du Fouarre* provided mathematical lectures not only in arithmetic, geometry, astronomy and music but also in *perspectiva*, a discipline which according to some artists was part of *mathematica*.[38] The questions on *perspectiva* preserved in F-Pn lat. 7378A (14th cent.) as well as those fashioned by the master of Arts, Domenicus de Clivaxio (1349-50), indeed suggest that at least by the middle of the fourteenth century the science of *perspectiva* had attracted some Parisian scholars.[39] Yet, most introductions to philosophy and the classification of sciences employed *mathematica* as a new name for the outdated *quadrivium*.

An early statute of the University of Caen issued in 1439, modelled on the usage of the Arts faculty of Paris, clearly limits the scope of *mathematica* to the *quadrivium*.[40] This is also the case in the statutes of the Parisian *Collège de Maître Gervais* issued in 1388. King Charles V provided the necessary revenue for two *scholares regis*, two masters of Arts who were to teach the students of the College 'de scientiis mathematicis, videlicet libros de quadrivio arcium liberalium licitos per sacros canones uel per Universitatem Parisiensem nullatenus reprobatos'.[41] Thus, under the heading *mathematica*, it seems that the curricular

[38] 'In urbe urbium Parisius in vico vocato Straminum […]. Amplius nonne dogmatizatur in vico philosophie infallibilis et incontradicibilis doctrine mathematice certitudo per quam numerorum et figurarum tam secundum se quam per celestes magnitudines, sonos armonicos ac visuales radios contractorum mirabilia accidentia indicantur.' (Johannes de Jandun, *De laudibus Parisius* quoted in Haas, 'Studien', 414).

[39] For the questions in F-Pn 7378A, see below Chapter 4. On Domenicus of Clavaxio's optical theories see G. Federici Vescovini, 'Les questions de perspective de Dominicus de Clivaxo', *Centaurus*, 10 (1964), 14-28.

[40] '[…] prout in vico Straminis Parisius legi solitum est […] aliquos libros mathematica ut *De sphera* et *Geometria*, *Musica* aut *Arithmetica*.'(M. Fournier, *Statuts et privilèges des universités françaises depuis leur fondation jusqu'en 1789*, [Paris, 1891], III, no. 1652).

[41] The statutes of the *College de Maître Gervais* are edited in P. Féret, *La faculté de théologie de Paris au Moyen Age* (Paris, 1896), III, 632-662, here 635.

prescriptions of the Arts faculty of Paris referred in fact to the four canonical disciplines of the centuries-old *quadrivium*: arithmetic, music, geometry and astronomy.[42]

In addition, the statutes of the *Collège de Maître Gervais* indirectly confirm that at the end of the fourteenth century, music and the rest of the *quadrivium* were still taught on feast days and that the University regulated this teaching. Indeed, one of the two masters of Arts hired by the College had to lecture 'de alio libro eiusdem quadrivii in aula artistarum dicti Collegii, diebus festivis et horis Universitate Parisiensi consuetis'.[43] From the beginning of the fourteenth century onwards or probably before, rhetoric (including the fourth Book of Boethius' *De Topicis*) and the *libri philosophici* disappeared from the curriculum while the *Barbarismus* and Aristotle's *Ethics* were integrated in the core curriculum of study.[44] The feast days then became reserved chiefly for the teaching of music and the other sciences of the *quadrivium* – though some lectures on moral philosophy and politics might also have been held on these occasions.[45] This was probably also the case in the fifteenth century. Following the usage established at the Arts faculty of Paris, the aforementioned 1439 statutes of the University of Caen impose for the licence lectures for extraordinary days (*diebus extraordinariis*) on moral philosophy, politics and on mathematical textbooks such as the *De sphera* (Johannes de Sacrobosco), the *Geometria* (Euclid), the *Arithmetica* (Boethius) and the *Musica* (Boethius).[46]

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[42] This differentiates the Arts faculty of Paris from that of Oxford where Witelo's *Perspectiva* was prescribed for the licence in the statutes of 1431. See *Statuta antiqua universitatis Oxoniensis*, ed. S. Gibson (Oxford, 1933), 234; see also J. Weisheipl, 'The Curriculum of the Faculty of Arts at Oxford in the Early Fourteenth Century', *Mediaeval Studies*, 26 (1964), 181.

[43] Féret, *La faculté*, III, 635; also quoted in Weijers, 'La place', 254. The second master had to lecture 'in vico Straminum diebus legibilibus, aliqua hora pro legendo in artium facultate ordinata'. The statute also specifies that these mathematical lectures were not 'ordinary' ones ('quia non legent [sc. scholares regis] ordinarie de dictis scientiis [sc mathematicis]') and thus that they were held in the afternoon like the 'cursory' lectures.

[44] See the 1366 statutes (*CUP*, III, no. 1359) and the oaths for the licence at Sainte-Geneviève (*CUP*, II, no. 1185). One of the *libri philosophici*, namely Boethius' *De consolatione philosophiae*, was prescribed for the licence. Yet, according to a later addition, the student could ask for a dispensation, a common practice which probably lead to the definitive disappearance of the treatise in the 1366 statutes.

[45] For instance in 1356-8, Albert of Saxony lectured on moral philosophy and politics on feast days. See *AUP*, I, 199 and 225.

[46] Fournier, *Statuts*, III, no. 1652.

Finally, the statutes of the *Collège de Maître Gervais* also raise the question of the place where music and the other quadrivial disciplines were taught. Guy Beaujouan hypothesized that this teaching was conducted not only in the schools of the Arts faculty but also in the masters' houses.[47] This is by and large plausible since the practice is explicitly attested in a University statute from 1245[48] and because, as we have seen, masters and students very often shared the same lodgings. Yet, another statute from 1276, reiterated in 1339, clearly prohibits, under the penalty of exclusion from the University corporation, all private teaching in a *locus secretus* except for grammar and logic.[49] Although it is impossible to determine to what extent this latter statute was respected, one can imagine that it had an effect on private lectures. Perhaps also, the definition of *locus secretus* did not include the parts of the *domus* of a master where the latter held official lectures on occasion.

The statutes of the *Collège de Maître Gervais* indicate that some mathematical teaching also took place in the collegial environment. This practice was in fact rather exceptional for only two other Colleges of the nearly fifty that cropped up in the fourteenth century on the Left Bank of the River Seine and on the Ile de la Cité, seem to have fostered mathematical activities. As early as 1315 the statutes of the *Collège de Navarre* prescribed that the master of Arts give lectures on a book of logic, mathematics or natural philosophy chosen by the majority of the scholars.[50] Furthermore, recently discovered documents indicate that the Cistercian *Collège de Saint-Bernard* also held mathematical disputations

[47] Beaujouan, 'Le quadrivium', 193; and Weijers, 'La place', 255.
[48] 'nullus magister sive actu regens, sive non actu regens, sive bachelarius uel quicunque alius aliquo die disputabili aliqua hora diei lectionem cursoriam nec in scolis nec in *domo propria uel aliena* legere presumat.'(*CUP*, I, no. 137; emphasis mine).
[49] *CUP*, I, no. 468 and *CUP*, II, no. 1023.
[50] 'aliqua hora diei aliquem librum logicalem, mathematicum uel grammaticalem in domo legere continue quem maior pars elegerit sociorum' (quoted in S. Lusignan, 'L'enseignement des Arts dans les collèges Parisiens au Moyen Age', in *EDFA*, 48).

and lectures which were open to the members of the Arts faculty, even though the main educational focus of this institution was the study of the *pagina sacra*.[51]

Judging from this evidence, one could hypothesize that some form of musical and mathematical instruction might have taken place in other regular foundations such as the Dominican convent of Saint-Jacques. After all, it is within the walls of this important centre of learning that friar Hieronymus de Moravia compiled his *Tractatus de musica*, the most important and complete *summa* of music theory in the thirteenth century, for the 'novices in the science of music'.[52] Although Hieronymus' main aim was to provide a succinct, clear and intelligible account of all the things needed *ad officium cantantium*,[53] his treatise is in fact largely devoted to *musica* as a quadrivial discipline. As Christian Meyer rightly notes, Hieronymus recopied almost entirely a glossed version of Books II-IV and to a lesser extent Books I and V of Boethius' *De institutione musica*.[54] In fact, Hieronymus' treatise does not reflect the Dominican pedagogical practice, for the Order paradoxically excluded the *quadrivium* from its *studia artium et naturalia*.[55] The kind of musical instruction encouraged by numerous General and Provincial Chapters throughout the thirteenth and fourteenth centuries had nothing to do with speculative music theory. It was centred on a practical instruction in chant limited to what was necessary for the performance of the conventual liturgy.[56]

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[51] These documents transmitted in the manuscripts B-BRs 189, 398 and 530 include *principia* or inaugural lectures in geometry and arithmetic, *commendationes* of lecturers in these disciplines and a disputation *de visione stellarum* held in the college and ascribed in one manuscript to Nicole Oresme. See J.-F. Genest, 'Une collection de discours inauguraux pour l'enseignement des Arts au Collège Saint-Bernard au 14e siècle', in *Du copiste au collectioneur*, eds. J.-F. Genest and D. Nebbiai-Della Guarda (Turnhout, 1998), 191-218.

[52] Hieronymus de Moravia, *Tractatus de musica*, ed. S. Cserba (Regensburg, 1935), 5.

[53] Ibid.

[54] C. Meyer, 'Lecture(s) de Jérôme de Moravie - Jérôme de Moravie, lecteur de Boèce', in *Jérôme de Moravie. Un théoricien de la musique dans le milieu intellectuel parisien du 13e siècle,* ed. C. Meyer (Paris, 1992), 56-74.

[55] Contrary to studies at the University, the *studia artium* of the Dominicans were devoted solely to logic, supplemented by *studia naturalia* concerned with the teaching of Aristotelian natural philosophy. On the Dominican *studia*, see M. Mulchahey, *'First the Bow is Bent in Study…' Dominican Education Before 1350* (Toronto, 1998), 220-277.

[56] See notably *Acta capitulorum generalium*, ed. B. M. Reichert, (Rome, 1899), II, 18 [Paris, 1306], 158 [Venise, 1325], 385 [Prague, 1359], 396 [Rouen, 1361], 415 [Valence, 1370], 428 [Beziers, 1376]; *Acta*

To sum up, a number of different statutes provide clear evidence that music as part of the *quadrivium* was continuously taught at the Arts faculty of Paris in the thirteenth and fourteenth centuries. Regulated by the University, this teaching was held on certain feast days of the academic year, probably at hours that did not hinder the liturgical and pastoral activities (e.g. university masses, processions and sermons) in which the students and masters, given their clerical status, had to participate. These music and *quadrivium* lectures were hosted by the schools of the *Rue du Fouarre*, although they occasionally also took place in three Colleges probably for the sole benefit of the *scolares* of these institutions. In addition, the masters possibly used their own lodgings, which they often shared with their students, to deliver this teaching. Finally, it is important to emphasize that, according to the statutory requirements, lectures on music and mathematics were *compulsory* for any candidate to the licentiate at the Arts faculty of Paris. Even though music and the *quadrivium* were from the beginning of the university relegated to the fringes of the curriculum, probably in continuity with former educational practices of the twelfth-century Parisian schools, they nonetheless played a role in the curriculum of the Arts faculty of Paris.

De forma *prescriptions*

Because instruction at medieval universities was essentially text-based, founded on the two central activities of scholasticism, *lectio* and *questio*, there remains the question as to which textbook was used to teach music at the Arts faculty of Paris. While the official documents of the Arts faculty give precious information about the main curriculum of study,

capitulorum provincialium provinciae romanae, eds. T. Kaepelli and A. Dondaine (Rome, 1941), 28 [Rome, 1263], 47 [Urbino, 1275; Pise, 1276], 52 [Salerno, 1279], 137 [Urbino, 1300], 242 [Florence, 1327], etc. Secular songs and written or extemporized polyphony were also very early on strictly prohibited in Dominican convents. See *Acta capitulorum generalium*, I, 23 [Bologna, 1242], 53 [London, 1250]; *Acta capitulorum provincialium provinciae romanae*, 13 [Anagni, 1252]; and also *Acta capitulorum provincialium. Province de Provence*, ed. C. Douais (Toulouse, 1894), 318 [Avignon, 1288].

they remain silent concerning the feast-day teaching. In contrast, the introductory literature from the Arts faculty recently studied by Claude Lafleur does contain information on the feast-day textbooks. Some of the introductions to philosophy, classifications of sciences, student guides and basic handbooks which compose this corpus, mirror the teaching program of the feast days, and they explicitly prescribe textbooks for all of these disciplines. These prescriptions are usually followed by the expression *de forma* (rendered freely as 'in accordance with the regulations'). Although the exact meaning and function of such an expression remains elusive, Lafleur recognizes that it is related to the regulation of the feast-day curriculum, emphasizing its official and compulsory character.[57]

Lafleur's list of the *de forma* prescriptions helps fill the lacunae of the Courson statutes of 1215.[58] It comprises: 1) Plato's *Timaeus* and Boethius' *De consolatione philosophiae*, described as the *libri philosophici* of the 1215 statutes; 2) three books of Aristotle's *Ethics*; 3) the *Rhetorice Tulii*, that is, Cicero's *De inventione* and the *Rhetorica ad Herennium*; 4) from around the middle of the thirteenth century, Johannes Sacrobosco' *De sphera*; 5) Boethius' *De arithmetica*; 6) at the end of the thirteenth century Johannes de Sacrobosco's *Algorismus* and a treatise on *Computus*; 7) the first six books of Euclid's *Elements*; 8) and finally, the first two books of Boethius' *De institutione musica*. Most *de forma* prescriptions are for geometry and music. This may be explained not because these two disciplines were particularly neglected[59] but rather because only the two textbooks for these disciplines are not studied in their entirety: six books out of fifteen of the Arabic Latin version of Euclid's *Elements* and two books out of five of Boethius' *De institutione musica*.

The *de forma* prescriptions highlight similarities between the mathematical curriculum of the University of Paris and important liberal Arts manuscript collections from

[57] See C. Lafleur, 'La réglementation curriculaire *de forma* dans les introductions à la philosophie et les guides de l'étudiant de la faculté des Arts de Paris au 13e siècle: une mise en contexte', in *L'enseignement de la philosophie*, 521-548; and also Weijers, 'La place', 263.
[58] Lafleur, 'La réglementation', 535-7.
[59] This isWeijers' opinion, 'La place', 263.

the Cathedral School of Chartres such as the manuscript GB-Otc 47 (early 12th cent.) or the famous *Heptateuchon* compiled *c*.1150 by Thierry of Chartres.[60] Yet, concerning music, the practice of reducing the study of Boethius' *De institutione musica* to the first two books does not seem to have originated in the twelfth century at the Cathedral School of Chartres.[61] The truncation of the treatise in Thierry of Chartres' *Heptateuchon* (fols. 125ra-140vb) seems not to be voluntary but rather accidental. The treatise breaks off mid-sentence at *De institutione musica* II, 21 and the ancient pagination of the manuscript indicates a gap of 104 folios, a gap that may have originally contained the rest of the treatise.[62] Keeping this in mind, the practice of only studying the first two books of Boethius' treatise appears as a true innovation from the Arts faculty of Paris. Furthermore, there is no evidence that this typically Parisian innovation was implemented in other centres of institutionalized learning, such as the Arts faculty of Oxford.[63]

A closer look at the *de forma* prescriptions for music confirms what the university statutes suggest. The prescriptions reveal a continuity in the teaching of Boethius' *De institutione musica* throughout the thirteenth century. The first *de forma* for the first two books of Boethius' treatise is found in the *Accessus philosophorum*, dated around 1230. The mention is later reiterated in several student guides from the 1250s, then in Johannes Dacus'

[60] GB-Otc 47 contains notably Boethius' *De institutione arithmetica* and *De institutione musica*, the so-called Adelard I and Adelard II versions of Euclid's *Elements* and finally Book VIII of Martianus Capella's *De nuptis Philologiae et Mercurii*. The mathematical content of Thierry of Chartres' *Heptateuchon* (F-CH 497-498 destroyed in 1944; microfilm at the IRHT, Paris) is roughly similar to that in GB-Otc 47, except that Thierry integrated other geometrical texts (such as Ps-Boethius' *Geometry I* and *Geometry II* or Gerbert of Aurillac's *Geometria*) and substituted the newly translated astronomical tables of Al-Kharizmi and Ptolemy to Martianus Capella's description of astronomy. On these two manuscripts see C. Burnett, 'The Contents and Affiliation of the Scientific Manuscripts Written at, or Brought to Chartres in the Time of John of Salisbury', in *The World of John of Salisbury*, ed. M. Wilks (Oxford, 1984), 127–60.

[61] Huglo, 'Ancient sources', 155.

[62] Burnett, 'The Contents', 142-7.

[63] The first text mentioning the teaching of music at Oxford is a statute for the Arts faculty dated from 1431. It prescribes the study of the *Musica Boecii* for one term but it does not specify whether the treatise was read in its entirety or in part. See *Statuta Antiqua*, 234; see also Weisheipl, 'Curriculum', 157.

Divisio scientiarum written *c.*1280 and it is also alluded to in Radulphus Brito's *Questiones mathematicales* composed shortly before 1299.[64]

A well-known passage from Jacobus Leodiensis' *Speculum musicae* complements the evidence derived from the *de forma* prescriptions.[65] In one of his many digressions, Jacobus recalls that in days of yore, as an undergraduate at the Arts faculty of Paris he attended lectures on the first two books of Boethius' *De institutione musica*.[66] Yet the accepted date of *c.*1280[67] given for the presence of Jacobus in Paris as an undergraduate, needs revision. According to recent research, Jacobus Leodiensis must be identified with a certain Jacobus de Montibus who, in 1316, received a provision for a benefice at the collegial church of Saint-Paul in Liège and who is documented at this institution from *c.*1325 onwards.[68] An important fact has been overlooked. Jacobus' petition to the Papacy for a benefice was part of a now lost *rotulus* of supplications sent by the University of Paris to Pope John XXII in 1316.[69] This practice aimed at facilitating access to ecclesiastical benefices for university members and more particularly for newly graduated students. Even though in the letter of provision, Jacobus' name does not bear the title *magister*, it is likely that he had, at that time, just received his master's degree.[70] Therefore, Jacobus' testimony

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[64] Lafleur, 'La réglementation', 535-7.

[65] See notably Huglo, 'Ancient sources', 171; and Id., 'De Francon de Cologne à Jacques de Liège', *RBM*, 34-35 (1980-81), 58.

[66] 'Ut de ea [sc. Musica Boecii] memoriale mihi retinerem, ut amplius in ea proficerem, ut confidentius illa uti possem, *qui de duobus primis libris, quos Parisius audieram, aliqua extraxeram*, plura coepi et de illis et de aliis excerpere.' (Jacobus Leodiensis, *Speculum musicae*, ed. R. Bragard, *CSM* 3 [Roma, 1955-1973], II, 56, p. 136; emphasis mine). Note that the pluperfects *audieram* and *extraxeram* clearly emphasize that Jacobus' Parisian sojourn took place in a distant past.

[67] Huglo, 'Ancient sources', 171.

[68] See K. Desmond, 'New Light on Jacobus, Author of Speculum musicae', *PMM*, 9/1 (2000), 19-40.

[69] The fragmentary rotulus of supplication from the University of Paris is reconstructed in *Rotuli Parisienses, Supplications to the Pope from the University of Paris.Volume I 1316-1349*, ed. W. Courtenay (Leiden, 2002), 23-38. On the university *rotuli* of supplications and on the procedure of petitioning for a benefice, see *Rotuli*, 1-17.

[70] The letter as edited by Courtenay reads: 'Jacobo de Montibus Anonie, providemus canonicatus sub expectatio prebendae in ecclesia Sancti Pauli Leodiensis, in eodem modo, Abbas monasterio Latigniacensis, Parisiensis diocesis, Nicolas de Ceccano Atrebatensis ac Magister Galtero de Auxiaco Noviomensis ecclesis canonicis.' (*Rotuli*, 26).

about lectures on the first two books of Boethius' *De institutione musica* can rightfully be resituated in the early 1310s when he was still attending lectures in the Arts faculty.

In sum, the *de forma* prescriptions and Jacobus Leodiensis' testimony confirm what the statutes had already pointed out, namely that music was continuously taught at the Arts faculty of Paris in the thirteenth and fourteenth centuries. Furthermore, up to the early years of the fourteenth century and perhaps even later, this teaching was conducted with the first two books of Boethius' *De institutione musica*.

Before turning to issues related to the content of the teaching of music at the Arts faculty of Paris a final pressing issue needs to be addressed. Was the *De institutione musica* the only musical textbook? The question is worth asking since there are examples of treatises which were used in the Arts faculty as companions for the study of certain disciplines, and which were the object of thorough study and commentary; this is notably the case in the thirteenth century for Petrus Hispanus' *Summulae* or Alexander Villadei's *Doctrinale* and Ebenhard of Bethune's *Graecismus*.[71]

In a recent article, Michel Huglo asserts, on the basis of close scrutiny of Parisian medieval library catalogues, that ancient sources of music theory were taught and studied at the French University.[72] It is useful to recall at this point that medieval libraries were largely built up through donations and that they had no rational policy or determined budget for the acquisition of books. As such, Parisian collegial and conventual libraries represent fortuitous concretions of private collections bequeathed by former members or by generous benefactors. In other words, their holdings do not reflect the actual needs of their users. The unique mathematical and musical collection of the medieval Sorbonne, for instance, reflects

[71] See S. Ebbesen and I. Rosier-Catach, 'Le trivium à la faculté des Arts', in *EDFA*, 124-7.

[72] Huglo, 'Ancient Sources', 162-172. For Huglo, the principal ancient sources of music theory in addition to Boethius' *De institutione musica* are: Augustine's *De musica*, the *Musica Isidori* (Book III of Isidore of Seville's *Etymologiae*), the section on music in Cassiodorus' *Institutiones*, Martianus Capella's *De nuptiis Philologiae et Mercurii*, Macrobius' *Commentarium in somnium Scipionis* and Plato's *Timaeus* with Chalcidius' commentary. A good survey of the influence of these ancient sources on medieval music theory treatises is M. Bernhard, 'Überlieferung und Fortleben der antiken lateinischen Musiktheorie im Mittelalter', in *Geschichte der Musiktheorie*, 3, ed. F. Zaminer (Darmstadt, 1990), 8-34.

the personal tastes and intellectual affinities of benefactors like Gerard d'Abbeville or Peter of Limoges[73] rather than a conscious endeavour to provide the students with the textbooks studied in the classrooms of the University. Hence, contrary to Huglo's assertion, the fact that Parisian medieval libraries owned copies of the ancient texts of music theory is purely circumstantial and incidental, and does not necessarily imply that these texts were subject to study, teaching or commentary.

A systematic survey of the glosses and commentaries on the principal ancient sources of music theory for the thirteenth and fourteenth centuries (namely Augustine's *De musica*, Martianus Capella's *De nuptiis Philologiae et Mercurii*, Macrobius' *Commentarium in somnium Scipionis* and Plato's *Timaeus*) is more revealing regarding the use of these texts in the late medieval classrooms. Due to space constrictions, I shall simply affirm here that most thirteenth- and fourteenth- century glosses and commentaries on the passages about music in these texts are either merely periphrastic, or derived from former dominant exegetical traditions, notably, in the case of Plato and Macrobius from the influential commentaries of the twelfth-century Chartrian master William of Conches.[74] Since these ancient sources of music theory share a common Platonic-Pythagorean philosophical paradigm, had they been studied in the Arts faculty they would no doubt bear the marks of a confrontation with the antagonistic philosophical paradigm that prevailed in the institution, namely Aristotelianism. In fact, the absence of such doctrinal juxtapositions as well as the dearth of traces of scholastic terminology and method in the thirteenth- and

[73] Gerard d'Abbeville, canon of Amiens, inherited the greatest bulk of the 300 books he bequeathed to the Sorbonne from another canon of Amiens, Richard of Fournival, a notorious mathematician, poet and musician. See among others R. Rouse, 'Manuscripts Belonging to Richard de Fournival', *Revue d'histoire des textes*, 3 (1973), 251-269. Peter of Limoges bequeathed to the Sorbonne approximately 120 volumes on astronomy, medecine, theology and most notably the only extant copy of Hieronymus de Moravia's *Tractatus de musica* (F-Pn lat. 16663). See L. Delisle, *Le cabinet des manuscrits de la bibliothèque nationale* (Paris, 1871-1881), II, 167-9.

[74] I intend to publish the result of my detailed survey on the late medieval reception of the ancient sources of music theory in a subsequent study.

fourteenth-century glosses and commentaries on the ancient sources of music theory are strong indicators that these texts were never the object of lectures at the *Rue du Fouarre*.

Thus, it would seem that the study of these texts continued during the flourishing period of the University but in other intellectual milieus. Therefore, contrary to what Huglo thought, the teaching and study of music at the Arts faculty of Paris was conducted with the first two books of Boethius' *De institutione musica* alone. However, this does not imply that passages from the ancient sources of music theory could not have been used in the classroom to commentate on Boethius' treatise. For instance, Radulphus Brito (prior to 1299), and the anonymous author of the basic handbook *Accessus Philosophorum* (*c*.1230) both refer to the first part of Plato's *Timaeus* in relation with the proem of Boethius' *De institutione musica*, or again, the anonymous author of the *Glossa in musicam Boecii* preserved in GB-Occ 118 evokes Macrobius on the question of the *musica mundana* in *De institutione musica* I, 3.[75]

The Content of Music Teaching

Jacobus Leodiensis' aforementioned autobiographical remark about his Parisian years, attending lectures on Boethius' *De institutione musica*, provides a good point of departure for a reconstruction of the content of musical instruction at the Arts faculty of Paris. Jacobus' reference to Paris is interpolated in his lengthy discussion of the problem of the semitone. Jacobus informs us that for a long time (*diu)* he believed that the minor and major semitones were founded on superparticular ratios, respectively 18:17 and 17:16, an

[75] Radulphus Brito, *Questiones mathematicales*, q. 41, ed. F. Hentschel, in *Sinnlichkeit und Vernunft in der mittelalterlichen Musiktheorie* (Stuttgart, 2000), 296; *Accessus Philosophorum*, ed. C. Lafleur in *Quatre introductions à la Philosophie du 13e siècle* (Paris, 1988), 205; *Glossa in musicam Boecii*, GB-Occ 118, fol. 5v.

opinion he derived from many *valentes musicae tractatores*.[76] When Jacobus undertook to write his *Speculum*, someone lent him a copy of Boethius' *De institutione musica*. Only at that point, did he realise that the music theorists he had studied so far distorted Boethius' view on the semitone.[77] Gaining awareness of his mistakes, Jacobus understood that his knowledge of Boethius' treatise was insufficient and biased; it was like being a novice in the science of music again.[78] He admits that, had he indulged in a more thorough and serious study of the first two books of the treatise, he would have rejected at once any erroneous opinions about the semitone.[79] This reference to the first two books gains its full significance when, in the next paragraph, Jacobus recollects his Parisian years. The Parisian lectures on the first two books and what he drew out of the treatise at that time were apparently not sufficient to prevent him from endorsing for many years an erroneous position on the problem of the semitone.

Jacobus' testimony discloses two important pieces of information about lectures on the first two books of the *De institutione musica* in the Arts faculty of Paris. This teaching did not delve deeply into the arithmetical matter of the treatise. It apparently did not consist of a systematic and continuous commentary on the text but rather was selective, focusing solely on certain aspects. In addition, it would seem that the lectures were not directly based on Boethius' treatise, or perhaps the students did not have immediate access to the text. As Jacobus tells us, even such a zealous music student as himself, who from an early date

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[76] 'Hanc opinionem aliqui valentes musicae tractatores tenuerunt […] Tactam opinionem de proportione semitoniorum quandoque et diu tenui, sumens eam ex aliquibus Musicae tractatibus, et ex imperfecto et etiam malo intellectu ipsius Boethii.' (Jacobus Leodiensis, *Speculum musicae*, II, 56, p. 135). The opinion Jacobus is alluding to stems from a misinterpretation of *De institutione musica* I, 16 (202-3) which can be traced back to the eleventh century and was adopted by many thirteenth-century Parisian music theorists (e.g. Lambertus, Hieronymus de Moravia and several anonymous authors of divisions of the monochord). For a succinct history of this mistake, see C. Meyer, 'Le *tractatus de consonantiis musicalibus* (CSI Anon. I, Jacobus Leodiensis alias de Montibus): une reportatio ?', *RBM*, 49 (1995), 16.

[77] Jacobus Leodiensis, *Speculum musicae*, II, 56, p. 135.

[78] '[I]gitur 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.' (Jacobus Leodiensis, *Speculum musicae*, II, 56, p. 136).

[79] '[L]icet, ex aliis Boethii dictis in primo et secundo libro, si perfecte advertissem, illam esse falsam potuissem percepisse, scilicet ex minimis terminis proportionis minoris semitonii quos ponit tam in primo quam in secundo libro et ex minimis terminis maioris partis toni quos ponit libro secundo, c. XXX.' (Ibid.).

decidedly preferred the science of music,[80] had access for the first time to a copy of Boethius' *De institutione musica* only long after his undergraduate years in Paris.

Do other documents confirm Jacobus' testimony? What then was the content of the lectures on Boethius' *De institutione musica* that Jacobus attended while he was a student at the Arts faculty of Paris? Which aspects of Boethian music theory were privileged and why? Did the way music was taught evolve over time? Such complex and wide-reaching questions are not easy to answer. Several types of source can help us.

The 'introductory literature' from the Arts faculty of Paris provides a solid ground from which to begin our exploration. Within this highly heterogeneous genre, it is imperative to concentrate on those texts which more explicitly reflect the teaching in the Arts faculty. Classifications of sciences and introductions to philosophy will not be of primary concern. These texts provide highly theoretical and yet often stereotyped topographies of the field of knowledge, which seem remote from pedagogical practices.[81] Indeed, such charts aim to be exhaustive. To do so, they integrate all known disciplines in a single schema, encompassing even incongruous ones such as necromancy or geomancy that obviously never had a place at the University.[82] Other introductory texts are more likely to offer valuable information: the examination compendia and the 'basic handbooks'.

Material evidence of the study of Boethius' *De institutione musica* in the thirteenth and fourteenth centuries will also uncover a seam of interconnected traces that can open a window onto the teaching of *musica* in the Arts faculty of Paris. Compilations of excerpts and abbreviations are good indicators of the way a text was studied and analysed. In his foundational article on the sources of Boethius' *De institutione musica*, Calvin Bower indeed singled out several compilations and abbreviations of the treatise which deserve

[80]'de musica […] quae inter ceteras scientias a iuventute mihi grata fuit et in senectute non me deseruit, sed tenuit quasi raptum et possessum.' (*Speculum Musicae*, I, 1, p. 11).
[81] Weijers, *Le maniement*, 32.
[82] See for instance the *Philosophica disciplina*, ed. Lafleur, in *Quatre introductions*, 235-6; Arnould of Provence, *Divisio scientiarum*, ed. Lafleur, in *Quatre introductions*, 320-1.

further study.[83] Glosses and commentaries constitute other material evidence through which information about the study of a text and the interest of a readership can be sifted. If no extant commentary on Boethius' *De institutione musica* has survived for the thirteenth and fourteenth centuries, there exist several significant unpublished sets of glosses hitherto neglected by modern scholars.[84] Because of the richness of the information conveyed in these glosses, the next chapter will be entirely devoted to them. In the meantime, let us turn to the other sources described above.

Examination Compendia and Basic Handbooks

The examination *compendia* from the Arts faculty of Paris are sets of model questions with suggested answers for the various disciplines of the Arts curriculum. These tracts were designed to help the students revise for the *licentia* examination. Two examination compendia from the Arts faculty of Paris survive: the *De communibus artium liberalium* (*c*.1250) and the well-known *Compendium of Barcelona* (*c*.1240), discovered in 1939 by Martin Grabmann in the manuscript E-Bac Ripoll 109. Both texts, recently edited by Claude Lafleur,[85] can be seen as reflections of the curricular requirements issued in the Courson statutes of 1215. In conformity with the 1215 statutes, the greatest part of both texts focuses on the main disciplines taught at the nascent University, namely grammar and logic.[86] That the two opuscules devote only a minimal section to natural philosophy confirms their early date of composition at a time when the ban on Aristotle's *libri*

[83] C. Bower, 'Boethius' *De institutione musica*. A Handlist of Manuscripts', *Scriptorium*, 42 (1988), 244-6.
[84] See the remarks by Haas, 'Studien', 338 or by M. Bernhard, 'Glosses on Boethius' *De institutione musica*', in *MTIS*, 147.
[85] *De communibus artium liberalium*, ed. C. Lafleur, in 'Un instrument de révision destiné aux candidats à la licence de la faculté des Arts de Paris, le *De communibus artium liberalium* (vers 1250 ?)', *Documenti e Studi sulla Tradizione Filosofica Medievale*, 5 (1994), 154-203; *Compendium of Barcelona*, ed. C. Lafleur, in *Le 'Guide de l'étudiant' d'un maître anonyme de la faculté des Arts de Paris au 13e siècle. Edition critique provisoire du ms. Barcelona, Arxiu de la Corona d'Arago Ripoll 109, ff. 134ra-158va* (Québec, 1992).
[86] These two disciplines occupy twenty-one of the twenty-four folios of the *Compendium of Barcelona* and four of six folios of the *De communibus atrium liberalium.*

naturales had just been lifted but before these books became set texts for examinations. In addition, they also contain sections on the feast-day disciplines described by Courson: rhetoric, the *libri philosophici* (Plato's *Timaeus* and Boethius' *De consolatione philosophiae*), Aristotle's *Ethics* and finally the four sciences of the *quadrivium*. This confirms that these disciplines were required for the licence examination.[87]

While the *De communibus artium liberalium* presents only a brief description for each textbook and discipline of the curriculum, there is, in the *Compendium of Barcelona*, an obvious discrepancy between the treatment of the 'ordinary' disciplines (grammar and logic) on the one hand, and that of the feast-day disciplines on the other hand. The sections on grammar and logic tackle issues also found in contemporary commentaries on the textbooks for these disciplines, though without the same doctrinal refinement and sophistication.[88] In contrast, the sections on the feast-day disciplines appear rather minimal; they are confined to questions regarding the epistemological particularities of a discipline, generally its *subiectum* and its place in the general partition of knowledge. It is noteworthy that the part of the *Compendium of Barcelona* dealing with the feast-day teaching also circulated separately and is now known from its incipit as the compilation *Primo queritur utrum philosophia*.[89]

Accordingly, the sections on music in the *De communibus artium liberalium* and in the *Compendium of Barcelona* are somewhat deceptive. Since these passages have recently received much attention from modern scholars,[90] it should suffice to recall a few significant

[87] Following Weijers ('La place', 248), I disagree with Haas ('Les sciences mathématiques', 95-6) for whom the *Compendium of Barcelona* is a schematic description of sciences which does not reflect the teaching practices of the Arts faculty.
[88] See the articles by I. Rosier-Catach, S. Ebbesen, E. Ashworth, H. Braakhuis, and L. De Rijk in the acts of the congress on the *Compendium of Barcelona* (*EPTS*, 255-368).
[89] This text is edited by C. Lafleur, 'Le recueil de questions *Primo queritur utrum philosophia*', in *EPTS*, 381-419. The section on music was also edited by Haas, 'Studien', 354-7.
[90] See notably Haas, 'Studien', 357-368. Christopher Page only proposes a succint analysis of the section on music in his *The Owl and the Nightingale, Musical Life and Ideas in France 1100-1300* (London, 1989), 139-141. E. Hirtler's analysis focuses more particularly on the notion of 'subalternation' and on the description of

points. 'Where is Boethius?' is the first question that naturally comes to mind when faced with the sections on music in the two examination compendia. As we have seen, the first two Books of the *De institutione musica* formed the official textbook for the teaching of music at the University of Paris. The anonymous author of the *Compendium of Barcelona* himself affirms that Boethius is the sole authority (*auctor*) for the science of music and that the first two books of his *De institutione musica* contain 'all he had to say on that science'.[91] Therefore one could expect that a music examination for the licence might centre on the main text studied in the classroom. Surprisingly, this is not the case.

The six questions of the *Compendium of Barcelona* and the single question of the *De communibus artium liberalium* on music clearly avoid any technical discussions that could have stemmed from a close reading of Boethius' treatise. Their interest lies elsewhere, notably in the determination of the *subiectum* for the science of music and in the description of its epistemological specificities which delimit its place in the general field of knowledge, notably in relation to the mathematical sciences in general, to natural philosophy, to arithmetic and to the arts of language.[92]

For that matter, knowledge of Aristotle's epistemology and natural philosophy proves more useful than that of Boethius' *De institutione musica*.[93] The notions of 'contractio', 'subalternatio', 'abstractio', 'differentia', 'subiectum', 'passio', 'quantitas' and 'numerus' expounded in Aristotle's logical and natural philosophical works appear to be the indispensable keys to an understanding of the sections on music in both examination

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the *subiectum* of music. See her *Die Musik als Scientia mathematica von der Spätantike bis zum Barok* (Frankfurt, 1995), 53-65. For the *De communibus artium liberalium*, see also Weijers, 'La place', 248-9.

[91] *Compendium of Barcelona*, § 51, 44.

[92] For the *De communibus artium liberalium*: 1) 'Utrum numerus relatus ad sonos sit subiectum in musica' (198-199). For the *Compendium of Barcelona*: 1) 'Utrum scientia que dicitur musica sit superflua?'; 2) 'Utrum musica subalternetur arismetice?'; 3) 'Quare de musica humana non est principaliter hec scientia sicut de instrumentali?'; 4) 'Utrum scientie poetice sub musica reponantur ?'; 5) 'Si musica est de numero contracto, non videtur esse scientia mathematica, cum omnis mathematica sit de rebus abstractis ?'; 6) 'Cum sonoritates musice et melodie fiant in tempore, quare non agit musicus de tempore' (44-6). The compilation *Primo queritur utrum philosophia* (408) adds two further questions treated in a prose form in the *Compendium*: 'Unde dicatur musica' and 'Quot sint symphonie in musica'.

[93] As Haas notes ('Les sciences mathématiques', 90), this comment can be generalised to all the mathematical sections of the *Compendium of Barcelona*.

compendia, more than any musical notion drawn from Boethius' *De institutione musica*.[94] Even in the passage in which the author of the *Compendium of Barcelona* describes the primary musical consonances and their ratios, he does not quote from Boethius' musical treatise. Not only does he omit the fifth canonical consonance of the Pythagorean tradition (the double octave) but he also uses the term *symphonia* and gives a short description for each interval, which derives from the chapter on the harmonic mean of Boethius' *De institutione arithmetica* and not from the *De institutione musica*.[95]

In fact, the few Boethian elements, which appear between the lines of the music sections in both compendia, are reinterpreted to fit the Aristotelian definition of music as a mathematical science concerned with the physical phenomenon of sound.[96] Both compendia transform the Boethian notion of *numerus relatus* described in the *De institutione arithmetica* or the *De institutione musica* as the subject of music. The Boethian *numerus relatus* is then consigned to the realm of arithmetic.[97] The subiectum for music becomes an ontologically ambivalent entity, partly mathematical, partly physical: the *numerus relatus ad sonos* in *De communibus artium liberalium* or *numerus contractus in sonoritatem* in the *Compendium of Barcelona*. Several questions and arguments are then devoted to the elucidation of the peculiar ontological nature of this entity.[98]

The redefinition of the *subiectum* of music also leads the author of the *Compendium of Barcelona* to modify Boethius' famous tripartition of music. *Musica mundana*, in charge of the harmony of the cosmos, is excluded because of its ineffability, and *musica humana,*

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[94] Some of these notions will be examined in more detail in Chapter 3. On *contractio* and *subalternatio* in the *Compendium of Barcelona*, see Haas, 'Studien', 360-365; Hirtler, *Die Musik*, 55-7.

[95] 'Una [sc. symphonia] dicitur diathessaron, et hec colligitur ex proportione que est inter VI et tria [et VI] et II; in sex enim duplum est ad tria et triplum ad duo' (*Compendium of Barcelona*, § 58, 46). See the following passage of the *De institutione arithmetica*: '[…] epitrita proportio colligetur, unde diatessaron symphonia resonabit. Inter .III. enim et .VI. ternarius est et inter binarium et senarium quaternarius, qui sibimet comparati sesquitertiam efficient proportionem' (Boethius, *De institutione arithmetica*, ed. J.-Y. Guillaumin [Paris, 1995], II, 48, p. 86).

[96] See Hirtler, *Die Musik*, 55-9. On music as a *scientia media* see also Chapter 3 below.

[97] *Compendium of Barcelona*, § 39, 41 and § 52, 44.

[98] See Hentschel, *Sinnlichkeit*, 137-147; with a useful list of the different definitions of the *subiectum* of music found in the didactic literature from the Arts faculty of Paris.

originally devoted to the harmony of the human soul and body, becomes a branch of *musica instrumentalis* dealing with the 'instruments of nature', that is with the human voice.[99] In fact, such changes maintain the unity of the science of music. According to Aristotle one science must have one delimited *subiectum*. Since the subject of music is the *numerus relatus ad sonos*, all the branches of music have to be readjusted accordingly.

In short, the *Compendium of Barcelona* and the *De communibus artium liberalium* indicate that the music examinations at the Arts faculty focused on issues surrounding the ontological definition of the *subiectum* of music and the epistemological specificities of this discipline. No doubt, a good background in Aristotelian logic and to a lesser extent in natural philosophy would have proved of greater help to the candidate than a thorough knowledge of Boethius' text.

However, one should keep in mind that the examination compendia did not aim to be exhaustive, but to provide only a few typical examination questions. For instance, the author of the *De communibus artium liberalium* informs us that he purposely limited himself to a 'superficial' (*superficie*) treatment of each discipline.[100] The author of the *Compendium of Barcelona* also specifies that he concentrated solely on the questions usually asked during the examinations.[101] Thus it is possible that questions about music asked in the classroom were more diverse and/or more refined than those preserved in the examination compendia.

A good example of such questions can be found in Radulphus Brito's *Questiones mathematicales* (prior to 1299), another text that could have been used to prepare for the licence examination. Brito was one of the prominent Parisian masters of Arts during the last

[99] In equating *musica humana* to vocal music, the author of the *Compendium of Barcelona* makes an allusion to the Guidonian hand: 'Dicendum quod [musica] humana uno modo potest appellari instrumentalis eo quod fit per instrumenta nature […]. Et si de humana etiam probatur hic aliqua passio communis, illa et quelibet talis evidentia in musica declaratur *quam addiscunt pueri in digitis ad cantandum*.' (§ 54, 45 and also § 50, 44; emphasis mine).
[100] *De communibus artium liberalium*, 202.
[101] *Compendium of Barcelona*, § 1, 1.

quarter of the thirteenth century.[102] His forty-eight *Questiones mathematicales* are the product, in *questio* form, of his teachings in mathematics. They comprise general questions on the epistemological specificities of *mathematica*, on arithmetic, on algorism, on geometry, on the *computus*, and finally four questions on music.[103] Here again, no question deals directly with the content of Boethius' *De institutione musica*. Although the logical structure as well as some of the arguments advanced by Brito are more elaborate and detailed than those found in the examination compendia, the issues raised are in fact very similar to those asked during the examinations (e.g. the epistemological relation of music to arithmetic and natural philosophy, the unity of the science of music, and the determination of the ontological specificities of its *subiectum*, the *numerus relatus ad sonos*).[104]

Doctrinal differences between the examination compendia and Brito's *Questiones* are nonetheless noticeable, an indication of Brito's greater mastery of Aristotelian logic, epistemology and natural philosophy. For instance, where the *Compendium of Barcelona* rejects the *musica mundana* understood as celestial music because of its ineffability, Brito discards it because in his *De caelo* Aristotle invalidates, on purely physical grounds, the very possibility that the motion of spheres can produce sound.[105] To give another example of doctrinal divergence, the *De communibus artium liberalium* describes the *numerus relatus ad sonos* as something which is 'actually one' whereas Brito excludes this kind of ontological realism by positing that the *numerus relatus ad sonos* is an 'accidental being'.[106]

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[102] On Radulphus Brito's career, see J.-L. Deuffic, 'Un logicien renommé, proviseur de Sorbonne au XIVème siècle. Raoul le Breton de Ploudiry. Notes bio-bibliographiques', *Pecia: ressources en médiévistique*, 1 (2002), 1-33.

[103] For a list of Brito's *Questiones mathematicales*, see O. Weijers, *La disputatio à la faculté des Arts de Paris (1200-1350). Esquisse d'une typologie* (Turnhout, 1995), 168-171. The questions related to music (qq. 7-8 and 39-42) have been edited by Frank Hentschel in *Sinnlichkeit*, 286-299.

[104] Two questions deal with the epistemological status of music (q. 39: 'Utrum musica sit sciencia'; q. 40: 'Utrum musica sit sciencia una') and another one with the *subiectum* (q. 42: 'Queritur circa subjectum').

[105] 'Unde Pythagorici posuerunt quod ista corpora supercaelestia ex motu suo dabant sonum valde melodiosum, sed Philosophus secundo Caeli et mundi hoc reprobat. Et ideo nulla harmonia ex illo motu causatur nec talis musica mundana est possibilis.' (Radulphus Brito, *Questiones mathematicales*, q. 40, 296).

[106] 'numerus refertur ad sonos tanquam ad differentiam sibi propriam et realem, ex qua cum ipso fit unum realiter' (*De communibus artium liberalium*, 199). 'numerus relatus ad sonos est ens per accidens' (Radulphus Brito, *Questiones mathematicales*, q. 39, 293; see also q. 42, 299).

In addition, Brito's fourth question on the usefulness of music (q. 41: 'Utrum musica sit utilis'), finds no counterpart in the examination compendia. Furthermore, it displays a certain knowledge of Boethius' *De institutione musica*. To those who affirm that music must be rejected by the *civitas* because it prevents men from accomplishing good deeds or from contemplating the truth, Brito opposes Boethius' eulogy of music.[107] In a few lines, he briefly condenses the content of the lengthy proem of the *De institutione musica* and its numerous edifying anecdotes: music is useful to the *civitas* only when practised under the rule of reason.[108] This reference to Boethius indicates that at least a minimum knowledge of the *De institutione musica* was required to understand this fourth question. The 'basic handbooks' could have provided such a minimal knowledge of the treatise.

Let us now turn to the 'basic handbooks' of the Arts faculty of Paris. The basic handbooks could be defined as short treatises containing elementary notions in select disciplines and designed for teaching or for revising purposes.[109] Four anonymous tracts from the Arts faculty of Paris fall under this category: 1) the *Accessus philosophorum* (*c*.1230), 2) the *Quedam communia* (post 1250), 3) the *Communia Parisiensis* (post 1250), 4) and the anonymous *Questiones mathematice* (post 1250) – not to be confused with Radulphus Brito's *Questiones mathematicales*. Claude Lafleur has recently edited the *Accessus Philosophorum*.[110] The text comprises a general division of philosophy and a description for each of the feast-day disciplines of the Courson statutes (the *quadrivium*, rhetoric and the *libri philosophici*, i.e. Plato's *Timaeus* and Boethius' *De consolatione philosophiae*). The hitherto unpublished *Communia Parisiensis* contains sections on logic and on each book of the Aristotelian *Organon*, a section on grammar, and sections for each

[107] '[musica] retrahit homines a bonis operibus […] per musicam homo impeditur a contemplatione veritatis. […] Oppositum vult […] Boethius etiam in principio Musicae suae.' (Radulphus Brito, *Questiones mathematicales*, q. 41, 296).
[108] 'Quod est utilis homini scientia ea [sc. musica] uti secundum regulam rationis, quia si quis sit nimis deditus passionibus, non est bonum […]. Sed homo utens ratione debet uti ista, quia multum retrahit hominem a diversis fantasmatibus et pravis.'(Ibid.).
[109] See Weijers, 'La place', 250; and Ead., *Le maniement*, 31.
[110] For the section on music see his *Quatre introductions*, 203-209.

feast-day discipline.[111] The equally unpublished *Quedam communia* is only concerned with mathematical sciences.[112] Finally, the *Questiones mathematice* is a composite compilation concerned with feast-day disciplines, which essentially combines passages from the three other basic handbooks.[113] An analysis of the overlooked sections on music in these four short treatises is apt to reveal interesting information about the teaching of the discipline at the Arts faculty of Paris.

The tracts open with a famous etymology of music that can be traced back to Remigius of Auxerre and which enjoyed great popularity in the Arts faculty of Paris.[114] While the author of the early *Accessus Philosophorum* attempts to preserve Boethius' definition of the subject of music,[115] the authors of the other basic handbooks redefine it as *numerus relatus ad sonos*, in accordance with the examination compendia and with all the didactic literature of the Arts faculty of Paris.[116] Yet as is emphasized in the *Quedam communia*, only those 'numbers related to sounds' which give rise to consonance can in fact become the object of musical study: 'musica est de numero relato ad sonos ex qua relatione fiunt consonantie musicales et ideo musica est de consonantiis'.[117] Such a definition helps the anonymous author invalidate an *obiectio communis* against positing the *numerus relatus ad sonos* as the subject of music: 'Et per hoc solvitur illud quod potest ei obici quod qua ratione musica est de numero relato ad sonos eadem ratione est de numero relato ad

[111] *Communia Parisiensis*, F-Pn lat. 7392, fols. 74va-79va; on music, fols. 78vb-79ra.
[112] *Quedam communia*, F-Pn lat. 15121, fols. 58ra-63vb; on music fols. 62vb-63va.
[113] *Questiones mathematice*, F-Pn lat. 16390, fols. 201va-206rb; on music fols. 204ra-va.
[114] 'Musica dicitur a moys quod est aqua et ycos quod est scientia quasi scientia reperta iuxta aquas'(*Communia Parisiensis*, fol. 78vb). See also *Quedam communia*, fol. 62vb; *Questiones mathematice*, fol. 204ra; *Compendium of Barcelona*, § 58, 46; Arnould of Provence, *Divisio scientiarum*, 327 [+ *apparatus fontium*]. On the origin of this etymology see N. Swerdlow, 'Musica dicitur a moys quod est aqua', *JAMS*, 20/1 (1967), 3-9.
[115] In fact the author of the *Accessus philosophorum* (203) juxtaposes Aristotle's definition of number as 'discrete quantity' in *Categories* 6 (4b24) with Boethius' *numerus relatus ad aliquid*, to obtain as a *subiectum* for music the 'discreta quantitas ad aliquid relata'.
[116] The *Communia Parisiensis* (fol. 79ra), *Quedam communia* (fol. 62vb) and *Questiones mathematice* (fols. 201va and 204rb) all equate the *numerus relatus ad sonos* with the *numerus sonorus*. Other definitions of the *subiectum* of music from the Arts faculty of Paris can be found in Hentschel, *Sinnlichkeit*, 144-6.
[117] *Quedam communia*, fol. 62vb; copied in *Questiones mathematice*, fol. 201va.

lapides.'[118] In several tracts the 'stones' of the example are replaced by 'asses' or 'horses'. The main idea is to show that the relation between sound and number is ontologically different from that between number and the numbered thing, in such a way that the latter is purely accidental and does not entail the creation of a new entity, namely consonance.[119]

The equation of consonance with the subject matter of music suits the description in the basic handbooks of the first two books of the *De institutione musica*. According to the *Accessus Philosophorum*, in the first book of the treatise, Boethius intends to deal with consonances in a narrative way (*secundum viam narrationis*), whereas in the second book, his approach is demonstrative (*secundum viam demonstrationis*).[120] The *Communia Parisiensis* compares the *De institutione musica* with Aristotle's *Topics*. In both cases the opening book deals with what will be subsequently tackled in more detail:

> Subiectum in primo libro est illud de quo principaliter tractat in sequenti opere sicut primus liber Topicorum se habet ad alios. In secundo libro intendit ostendere in quibus proportionibus habent esse musice concordancie et earum partes sive ibi declaratur que proportiones in sonis habent facere concordantiam.[121]

Such descriptions of the *De institutione musica* confirm its position as the textbook for *musica* strictly envisioned as a 'science of consonance'.

Contrary to the examination compendia and to Radulphus Brito's *Questiones mathematicales*, the basic handbooks do not approach music from the point of view of Aristotelian epistemology but from the point of view of Boethian consonance theory. Yet this interest in Boethius' treatise varies from one handbook to the next and it does not seem to extend beyond the quotation or paraphrase of a few definitions.

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[118] Ibid.
[119] On this see Hentschel, *Sinnlichkeit*, 137-8.
[120] *Accessus Philosophorum*, 204; copied in *Questiones mathematice*, fol. 204va.
[121] *Communia Parisiensis*, fol. 79ra

Apart from the *Accessus Philosophorum*, which reports the Boethian tripartition of music and other more unusual passages such as those on the definitions of the *comma*, *scisma*, *diacysma* or the description of the three melodic genera and the five tetrachords, all other quotations from the *De institutione musica* in the basic handbooks concern consonance.[122] To the famous definition of consonance as 'a concord of mutually dissimilar pitches brought together into one',[123] the author of *Quedam communia* adds further definitions that Boethius borrowed from Ptolemy.[124] The author of this tract also proposes yet another definition of consonance, this time summarizing Boethius' description of the proportional relation between pitch and motion. The faster the velocity of the motion that sets the sound-producing object into vibration, the higher the pitch and conversely, the slower the velocity, the lower the pitch. The comparison between two sounds therefore implies a quantitative comparison of the velocities of their respective motions.[125] As the author of *Quedam communia* maintains, because the velocities of two different motions are always proportionate, 'sonus acutus et gravis in quadam proportione numerali consistunt et per consequens musicales consonantie aptantur proportionibus numeralibus'.[126] Yet numerical proportions are infinite. If a consonance corresponded to each proportion, there

[122] *Accessus Philosophorum*, 206-209. See also the description of this passage given by C. Meyer, 'Lectures et Lecteurs du *De institutione musica* de Boèce au 13e siècle', in *Boèce ou la chaîne des savoirs*, ed. A. Galonnier (Louvain, 2003), 668.
[123] Boethius, *De institutione musica*, I, 3, p. 190. *Communia Parisiensis*, fol. 79ra; *Quedam communia*, fol. 62vb; *Questiones mathematice*, fol. 204ra.
[124] 'Consonantia est sonorum acuti et gravis sibimet permixtorum ad aures perveniens suaviter et uniformiter eis accidens. Dissonantia est sonorum sibimet impermixtorum ad aures perveniens dura atque immodesta collisio. Intervallum est distantia duorum sonorum proximum' (*Quedam communia*, fol. 63ra; this passage is also copied in the *Questiones mathematice*, fol. 204va). In fact, Boethius (*De institutione musica* I, 8, p. 195) borrows these definitions from Nichomacus' *Enchiridion*. See C. Bower, 'Boethius and Nicomachus. An Essay Concerning the Sources of *De institutione musica*', *Vivarium*, 16/1 (1978), 7.
[125] 'Sonus acutus causatur ex motu veloci, gravis autem causatur ex tardo. Ex autem pluribus motibus constat sonus acutus quam gravis et ideo quadam substractione motuum ex acuto potest fieri gravis, quadam additione ex gravi potest fieri acutus.'(*Quedam communia*, fol. 62vb). The same passage is also copied in the *Questiones mathematice*, fol. 204ra. The source of this statement is Boethius, *De institutione musica*, I, 3, pp. 189-191.
[126] *Quedam communia*, fol. 63ra; *Questiones mathematice*, fol. 204rb.

would be an almost infinite number of consonances.[127] It is therefore necessary to impose a limitation:

> Proportiones numerales et consonantie musicales ad sonum aptantur in hoc quod consonantie musicales aptantur proportionibus numeralibus illis quarum proportionum termini conveniunt in eadem mensura communi seu in parte aliquota et solum aptantur talibus proportionibus numeralibus, et quia non omnes proportiones numerales sunt huiusmodi, ideo non omnibus aptantur consonantie musicales.[128]

The author simply restates, though in a different form, the Boethian restriction of consonance to the multiple (*in eadem mensura communi*) or superparticular (*in parte aliquota*) ratios.[129] The expressions 'proportio numeralis' and 'proportio non numeralis' hint at a knowledge of Euclidian number theory which extended the realm of ratio to integrate irrational ratios and the notion of incommensurability.[130]

If all the basic handbooks promote similar Boethian views of consonance, the number of intervals deemed consonant remains an issue. As in the *De institutione musica*, the *Communia Parisiensis* lists the five canonical consonances of the Pythagorean tradition: octave (2:1), twelfth (3:1), double octave (4:1), fifth (3:2) and fourth (4:3) - i.e. those musical intervals based on the numbers that compose the tetractys (1, 2, 3, 4).[131] The other basic handbooks go against Boethius and include the whole tone among the consonances.[132] In addition, the *Quedam communia* further extends the realm of *consonantia* to include the major and the minor semitones. Such an inclusion can be explained by the fact that the author of this tract erroneously ascribes two superparticular ratios to the minor and major semitones, respectively 18:17 and 17:16:

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[127] 'consonantie musicales aptentur proportionibus numeralibus, ergo consonancie multiplicabuntur secundum multiplicationem proportionum numeralium que sunt fere innumerabiles.' (*Quedam communia*, fol. 63ra; copied in *Questiones mathematice*, fol. 204rb).
[128] *Quedam communia,* fol. 63ra.
[129] See for instance Boethius, *De institutione musica* I, 5, pp. 192-3.
[130] See below Chapter 2, 105-107.
[131] 'Quinque sunt species musice scilicet dyatessaron, dyapente, dyapason, [dyapason] cum dyapente et bisdyapason'. (*Communia Parisiensis*, fol. 79ra).
[132] *Accessus Philosophorum*, 205; *Questiones mathematice*, fol. 204rb; Johannes Dacus, *Divisio scientie*, ed. A. Otto (Copenhagen, 1955), 30; Arnulph of Provence, *Divisio scientiarum*, 328. For the exclusion of the whole tone from among the consonances see Boethius' *De institutione musica*, I, 10, p. 198.

> Semitonium in sonis est quando est ita pauca elevatio quod si fieret minor non perciperetur verbi gratia mi fa inter le mi et le fa et potest aptari proportioni que est inter 18 et 17. Semitonium maius aptatur proportioni que est inter 17 et 16.[133]

As seen above, this is precisely the mistake that Jacobus Leodiensis absorbed from several music treatises and while attending music lectures in Paris.[134] The *Quedam communia* suggests that this 'semitone fallacy' was indeed widely accepted and taught at the Arts faculty.

More certainly, the fact that such a statement was included in basic handbooks confirms that no serious study of Boethius took place in the schools of the *Rue du Fouarre*. Indeed, the determination of the ratio of the semitone was one of the touchstones of music as a quadrivial discipline or as Jacques puts it: 'quasi ianuae fundamentumque scientiae [musicae] aedificii'.[135] In the centuries that preceded the advent of the universities, the determination of the ratio of the semitone was one of the most profusely and diversely discussed problems of Pythagorean music theory.[136] Because it involved complex computations, the problem of the semitone was indeed put aside by the masters of Arts. In fact, this rejection of arithmetical digressions is symptomatic of the orientation of the basic handbooks. In most cases, they simply list the ratio for each consonance without delving into the exertions of arithmetical demonstration. For instance, the author of the *Accessus Philosophorum* simply summarizes passages from Boethius' *De institutione musica* (I, 17-

[133] *Quedam communia*, fol. 63ra; also copied in the *Questiones mathematice*, fol. 204ra. Note the use of the French article *le* in the accusative before *mi* and *fa*, commonly use in logic texts from the Arts faculty of Paris to indicate that the term must be understood autonymically. See S. Lusignan, *Parler vulgairement. Les intellectuals et la langue française aux XIII^e et XIV^e siècles* (Paris, 1986), 74-7.
[134] See above. The whole demonstration is summarized in the *Accessus Philosophorum* (206-7) and in the *Questiones mathematice* (fol. 204va).
[135] Jacobus Leodiensis, *Speculum musicae*, II, 56, p. 136.
[136] See below, Chapter 2, 91-2.

9).[137] The author of the *Quedam communia* opts for a more pragmatic stance and gives concrete examples for each consonant interval with the aid of solmisation syllables.[138]

To recapitulate, the basic handbooks, the examination compendia and Radulphus Brito's *Questiones mathematicales*, present complementary views of the teaching on music in the Arts faculty of Paris. On the one hand, this teaching had very little to do with Boethius' *De institutione musica*, as the examination compendia and Brito's *Questiones mathematicales* indicate. The texts focus on questions of epistemology and classification. Knowledge of Aristotelian logic and natural philosophy proves more useful to answer the questions on music than an acquaintance with the presumed textbook for the discipline, namely the first two books of Boethius' *De institutione musica*. This also applies to the other quadrivial disciplines, to the extent that when the questioning goes beyond matters of classification and epistemology, the problems raised find counterpart in commentaries on Aristotle's works.[139]

On the other hand, the basic handbooks indicate that a minimal knowledge of Boethius was expected. This knowledge amounted to a few definitions chiefly focused on the notion of consonance. These definitions were woven into the masters of Arts' redefinition of the *subiectum* of music and into general Boethian descriptions of pitch, sound, interval, etc. One of the most surprising features of the handbooks is the careful exclusion of all numerical data and computations which are so central to the kind of speculative music theory expounded by Boethius. Yet the function of the basic handbooks is not clear. I would be inclined to think that they do not mirror lectures on music. Rather they

[137] *Accessus Philosophorum*, 207-8; copied in the *Questiones mathematice*, fol. 204va.
[138] For instance: 'Dyapason in sonis idem est quod duplum in numeris ut cum vox acuta in duplo excedit gravem, verbi gratia ut sol ita quod sunt ibi octo voces interposite verbi gratia ut re mi fa sol la fa[ut] sol[re ut].'(*Quedam communia*, fol. 63ra; copied in the *Questiones mathematice*, fol. 204rb).
[139] For instance, the question by Radulphus Brito on the metaphysical and logical implications of the distinction between 'one' and 'many' ('Utrum unum et multa opponantur', *Questiones mathematicales*, q. 15, F-Pn lat. 16609, fols. 35rb-vb) is found in several Parisian commentaries on the *Metaphysics*. See for instance Petrus de Alvernia, *Questiones in Metaphysicam*, GB-Cpc 152, IV, q. 7, fol. 159ra ('Utrum unum et multa opponantur privative').

could have been used as revision aids for the examinations. Indeed, armed with the minimal descriptions of music and the few Boethian definitions that they offer, and with a good knowledge of Aristotelian logic, a student could have answered the music questions raised in the examination compendia.

The evidence adduced so far presents an image in which the teaching of music is not text-based but rather 'text-less'. In this case, why affirm and reaffirm, as in the tracts from the Arts faculty of Paris, that the first two books of Boethius' *De institutione musica* constitute the unique textbook of the discipline? Why place it among the texts *de forma*? Answers to these questions can only emerge through an exploration of the material evidence of the study of Boethius in the thirteenth and early fourteenth centuries, that is, from compilations of excerpts, abbreviations and glosses. This will occupy the remainder of the present chapter as well as the subsequent one.

Compilations

The act of selecting, excerpting and compiling snippets from a text is in itself significant. It clearly shows which passages a particular readership deemed more pertinent than others. This practice was current at the University and was notably applied to the whole Aristotelian corpus. Besides philosophical *florilegia* such as the famous *Auctoritates Aristotelis* (which included quotations from all the works of Aristotle, but also from Averroes, Boethius, Seneca, Plato, Porphyry, Apuleus, etc.), there also existed a compilation of excerpts or *puncta* for each of the Aristotelian textbooks.[140] These collections of quotations could have served, like indexes and tables, as a teaching aid, facilitating the

[140] For several examples, see M. Grabmann, *Methode und Hilfsmittel des Aristotelesstudiums im Mittelalter* (Munich, 1939), reprinted in *Gesammelte Akademieabhandlungen* (Munich, 1979), II, 1602-1634. On philosophical florilegia see J. Hamesse, 'Les florilèges philosophiques, instruments de travail des intellectuels à la fin du Moyen Age et à la Renaissance', in *Filosofia e Teologia nel Trecento*, ed. L. Bianchi (Louvain, 1994), 495-7.

retrieval of information needed to elaborate a course.[141] They could also have been used by students as tools for revision on a particular subject.[142] Thus, one could imagine that a compilation of excerpts from the *De institutione musica* had the same purpose and so displayed all the material needed for music lectures and examinations.

Three late medieval manuscripts have traditionally been regarded as compilations of excerpts from Boethius' *De institutione musica*: GB-Lbl Harley 625, fols. 175r-v; B-BRs 528, fols. 47r-v and 50v-51r; and GB-Lbl Harley 957, fols. 1r-2r and 32r-v.[143] The tract in GB-Lb Harley 625 can be immediately discarded. It is not a compilation of excerpts from Boethius' *De institutione musica* as Max Haas thought but rather an incomplete music treatise.[144] This latter treatise breaks off on 'arsis et thesis, ie elevatio, depressio' after a definition of the three melodic genera and the cunjunct (*synapte*) and disjunct (*dieuzeuxis*) tetrachords. The bulk of the treatise consists of a description of nineteen musical intervals (from the minor semitone to the double octave and a fifth) and the means of finding them on the monochord. A similar division of the monochord into nineteen intervals is notably found in Johannes de Muris' *Musica speculativa* which might be one of the sources for this tract.[145]

The two other manuscripts are more probable candidates for an association with the University milieu. B-BRs 528 is known to musicologists as one of the earliest copies of Johannes de Garlandia's *Musica mensurabilis,* a late thirteenth-century copy glossed in the margins with excerpts from the so-called Anonymous 7 treatise, from Guido of Arezzo's

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[141] See notably R. Rouse, 'Le développement des instruments de travail au 13e siècle', in *Culture et travail intellectuel dans l'Occident médiéval*, eds. G. Hasenohr and J. Longère (Paris, 1981), 115-144.
[142] See for instance the colophon of a fifteenth-century compilation of excerpts from Aristotle's *De caelo* which makes explicit the function of such a tract: 'Puncta principalia ex libris Aristotelis de Caelo et mundo […] quae pro baccalaureatis et magistris in universitate Coloniensi quaeri olent in temptamine et examine in rubea camera.' (D-Mbs Clm 2971, fol. 33va).
[143] See Bower, 'Handlist', 244-6.
[144] Haas, 'Studien', 338.
[145] *Musica Speculativa*, A version, ed. C. Falkenroth (Stuttgart, 1992), 282; B version, ed. C. Falkenroth (Stuttgart, 1992), 283; A/B version, ed. S. Fast, (Ottawa, 1994), 344.

Micrologus and from the Milan organum treatise.[146] The Boethian compilation transmitted in the Bruges manuscript is then roughly contemporary with the basic handbooks from the Arts faculty of Paris. The Bruges compilation interweaves chapters from the *De institutione arithmetica* with some from the *De institutione musica*. The orientation seems, from the start, to be essentially arithmetical. The compilator focuses more particularly on Boethius' descriptions of the five traditional species of ratios, of proportionality and of the arithmetical, geometrical and harmonic means. Concerning more musical matters, passages on the numerical foundation of musical consonances and on computations for the ratio of subtonal intervals (minor semitone, major semitone and comma) are given pride of place. The fact that the Bruges compilation includes a great deal of material from Book III of the *De institutione musica* and puts a strong emphasis on number, in principle precludes any relation with the Arts faculty milieu. Rather, the Boethian compilation seems to be part of a greater whole: it precedes a short tract on acoustic metrology, another compilation of abstracts from Guido of Arezzo's *Micrologus* and Boethius' *De institutione musica* and the glossed copy of Johannes de Garlandia's *Musica mensurabilis*. Taken together, these tracts form a comprehensive compendium that encompasses the rational foundations (speculations on intervals and their numerical foundation) as well as more praxis-oriented aspects (plainchant theory, discant and *musica mensurabilis*) of music theory. The Bruges compilation therefore purports to give a complete course on music in which, to recall the word of Jacobus Leodiensis, '[musica] practica rationis poscat supplementum'.[147] This seems far removed from the preoccupations of the Arts faculty.

The last compilation of excerpts from Boethius' *De institutione musica*, in contrast, brings us back closer to the Arts faculty. It is found in the manuscript GB-Lbl Harley 957

[146] For the marginal content of this manuscript see S. Pinegar, 'Exploring the Margins: A Second Source for Anonymous 7', *Journal of Musicological Research*, 12 (1992), 213-243.
[147] *Speculum Musicae*, I, 20, p. 66.

that can be dated to the first half of the fourteenth century.[148] In contrast with the Bruges compilation, the excerpts selected in the Harley compilation do not include computations and instead concentrate on definitions and general philosophical issues. For instance, the compilation transmits extensive quotations from the prologue of Boethius' treatise on the ethical usefulness and the therapeutic powers of music. The compiler also lingers on those passages in Book I in which Boethius reaffirms the superiority of reason in musical matters over the fallacies of sense perception. In correlation, the chapter opposing the virtuous and sovereign *musicus* to the sometimes irrational instrumentalists and poets, is copied almost in its entirety. These quotations give a good idea of the kind of rational approach to music recommended by Boethius and the philosophical background on which that approach was grounded.

In addition to these passages, the Harley compilation borrows numerous definitions. A first group of these definitions is of a classificatory nature: a definition of the *quadrivium*, of the tripartition of music (*musica mundana*, *musica humana*, *musica in quibusdam instrumentis constituta*) and finally of the division of instrumental music into three genera (*diatonica, enarmonica, chromatica*). The other definitions are more directly related to consonance theory and include general definitions of sound, of articulated sound (*vox*) and a brief explanation of the mechanisms of sound propagation; definitions of musical intervals, of consonance and dissonance; passing reference to the impossibility of dividing the whole tone into two equal parts; a brief description of the five Pythagorean consonances; and finally, a description, borrowed from Book IV, of the seven octave species of Greek music.

It is noteworthy that the patchwork of definitions in the Harley compilation resembles that in the chapter on music in the widely diffused thirteenth-century

[148] Bower, 'Handlist', 245.

encyclopaedia by the Dominican compiler Vincent of Beauvais, the *Speculum*.[149] Indeed, both texts give enough information to relocate *musica* within the broader field of knowledge, to characterize its various subdivisions, to define consonances by putting a strong emphasis on the acoustic dimension of the phenomenon without delving into arithmetical technicalities and finally, to promote a conception of music as a rational science useful to the *civitas*. While the *Speculum* is a colossal multi-volume reference work that was probably not very suitable for a classroom setting, the much more easy to handle Harley compilation would have better fitted such a context. As a concise digest of the first two books of the *De institutione musica*, the latter not only matched the needs and orientations of a university classroom but it also offered an ideal textual basis, available to the masters of Arts, for the elaboration of a course on music.

Abbreviations

Like abstracting and compiling, abbreviating a text is not a neutral operation. It implies a dual process of selection and rendition. A process of rendition, because an abbreviation ought to be a more accessible substitute for an original text, and as such it is bound to transmit as faithfully as possible the *intentio auctoris*. A process of selection, because the act of abbreviating implies a reduction of the original text to what is deemed essential. Moreover, an abbreviation is always tailored in accordance with the specific needs and interests of a particular readership. The text to be abbreviated is therefore copied, truncated, summarized, rephrased, adapted and reorganized in accordance with an implicit or explicit intention. This intention can be reconstructed through a close scrutiny of the

[149] The chapter on music in Vincent of Beauvais' *Speculum Doctrinale* (XVII, 10) has been edited and analysed by G. Göller, *Vinzenz von Beauvais O.P. (um 1194-1264) und sein Musiktraktat im Speculum doctrinale* (Regensburg, 1959).

abbreviation in comparison with the original text. It informs us of the way the latter is envisioned, studied and, even, taught.

The practice of abbreviating textbooks was common in medieval universities. For the thirteenth and fourteenth centuries, there exist numerous abbreviations of the works of Aristotle not only from the Arts faculty of Paris but also from other centres of institutionalised learning.[150] The practice was even applied to mathematical textbooks: Euclid's *Elements*, Boethius' *De institutione arithmetica* and, more important for us, his *De institutione musica*.[151]

The late fifteenth-century Italian manuscript I-Sc LV 30 (fols. 144r-146r) contains a succinct and well-organised but incomplete summary of *De institutione musica* I, 1-4, 6, 7 and 10 which breaks off in mid-sentence after the description of the legend of Pythagoras' discovery of musical consonances at the forge. The summary appears as a succession of notes in which direct quotations from the text alternate with close paraphrases.[152] Although I-Sc L V 30 contains several Parisian treatises on *musica mensurabilis* from *c*.1250-1350, the Boethian summary cannot be considered as an authoritative witness of the reception of Boethius in Paris at that time. This tract is part of a theoretical patchwork added at the end of the manuscript, which indiscriminately jumbles together snippets of speculative music theory, chant theory and *musica mensurabilis*. Such confusion makes any attempt at dating and securing a provenance for the Boethian tract very hazardous.

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[150] For instance, the manuscript D-Eru 434 contains abbreviations of Aristotle's *Ethica*, *Physica, De Caelo, De generatione et corruptione, De anima* and of the *parva naturalia*. See also the many other examples gathered by Grabmann, *Aristotelesstudiums*, 1500-1550.

[151] Several manuscripts of the so-called Adelard II version of Euclid's *Elements* contain only the enunciations of first six books of the treatise in conformity with the *forma* prescription at the University of Paris: D-DS 739, fols. 1r-39v, I-Fn J I 18, fols. 137r-160v or D-Mbs Clm 3523, fols. 3r-21r. On the abbreviations of Boethius' *De institutione arithmetica* see below.

[152] See for instance the summary of the final paragraphs of *De institutione musica* I, 1: 'Nota quinto: statum *anime et nostri corporis quodammodo compositum esse* [ex] *proportionibus et armonicis modulationibus*, quia omnes sine gaudio, sine luctu oblectatione musica modulantur, *unde antiquitus in more erat in luctu tibium preire*. […] Item cum quis audit modum velit nolit corpus afligit cum ei similis motus sit. Et si *aliquis canere* nescit *aliquid*, sibi canit, ut *aliqua voluptate id quod canit afficiat*, quare *musice naturaliter coniuncti sumus*, et *ea si vellemus carere non possumus*.' (I-Sc L V 30, fol. 144v; quotations from Boethius' text are italicized).

Johannes de Muris' *Musica Speculativa* (1323-5) has long been considered the only 'abbreviation' of Boethius' *De institutione musica*.[153] Yet, in an article published in 1981, Alison White discovered another abridgment of the first two books of the treatise.[154] Christian Meyer has recently edited this *Abbreviatio in musicam Boecii*.[155] Although he refers to a possible university provenance, Meyer remains quite elusive concerning the origin and date of this text. I would argue that this text constitutes an important testimony of the teaching and study of music in the Arts faculty of Paris *c*.1230-60.

Several formal features suggest that the *Abbreviatio in musicam Boecii* is a product of the Arts faculty of Paris. The very fact that the *Abbreviatio* summarizes only the first two books of Boethius' *De institutione musica* is reminiscent of the *de forma* prescriptions. In fact, after having abridged the proem of the treatise, the abbreviator explicitly recalls the Parisian curricular usage: 'Parte prohemiali terminata, tunc sequitur pars executiva huius scientie que dividitur in quinque libros partiales […] Istorum quinque duo sunt de forma.'[156] As in many tracts from the Arts faculty of Paris, the *Abbreviatio* also characterises the *De institutione musica* as a treatise on consonance. More precisely, the description of the first two books of the treatise in the *Abbreviatio* is very close to that found in the basic handbook *Accessus philosophorum* (*c*.1230) and recopied in the *Questiones mathematice* (*c*.1250). In all these texts, the first Book of the treatise is described as one dealing with consonance 'in a narrative way' (*narrative*) and the second Book as offering a complementary approach to the same problem 'in a demonstrative way' (*demonstrative*).[157]

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[153] Muris clearly describes his intention in the prologue of the treatise: 'Visum est mihi bonum, ut ex musica Boethii, […] tractatum brevem elicerem'. (*Musica speculativa*, A, 74; A/B, 4-6). As Haas notes ('Studien', 338) the treatise is also described as an 'abbreviatio' in several manuscripts.

[154] A. White, 'Boethius in the Medieval Quadrivium', in *Boethius. His Life, Thought and Influence*, ed. M. Gibson (Oxford, 1981), 203.

[155] C. Meyer, 'Un abrégé universitaire des deux premiers livres du *De institutione musica* de Boèce', *AHDLMA*, 65 (1998), 91-121 [edition, 109-121]. The *Abbreviatio in musicam Boecii* is transmitted in three manuscripts: GB-Ob Laud. Misc. 644, fols. 139r-142v (Normandy, Bayeux; 1273-4); GB-Ob Digby 191, fols. 68v-70v (Merton College, Oxford; early 14th cent.); GB-Gu 461, fols. 34v-37r (French; end 14th cent.).

[156] *Abbreviatio in musicam*, 111.

[157] *Abbreviatio in musicam*, 111; *Accessus Philosophorum*, 204; *Questiones mathematice*, fol. 204va.

The presence of an *accessus* to the text modelled on the schema of the four Aristotelian causes (formal, material, efficient, final) further strengthens the Parisian connection.[158] René-Antoine Gauthier has shown that this *accessus*-schema was developed at the French University in the 1220s and had become ubiquitous by the middle of the thirteenth century.[159] More enlightening perhaps, the *accessus* of the *Abbreviatio* is strikingly similar to the description of Boethius' *De institutione musica* according to the Aristotelian schema of the four causes which opens the section on music in the *Accessus Philosophorum*.[160]

Finally, marks of scholastic terminology and method, clearly apparent in the *Abbreviatio in musicam*, cast away all doubts regarding the provenance of this text. For instance, the anonymous author of the *Abbreviatio* reorganizes the first book of the *De institutione musica* into six artificial 'chapters'.[161] Each 'chapter' opens with a short summary of the *intentio* ascribed to Boethius. The summary is then followed by a more detailed exposition of the text in which condensed paraphrases alternate with direct quotations.[162] Such a procedure is typical of the early commentaries (*c.*1230-60) on Aristotle from the Arts faculty of Paris where the summary of the *intentio* of the author or *sententia in generali* is often interpolated between the segmentation (*divisio textus*) and a detailed paraphrase (or *sententia in speciali*) of the text commented upon.[163] It is also found in

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[158] On the notion of *accessus* and the different schema elaborated by medieval scholars see the fundamental studies by E. Quain, 'The Medieval *Accessus ad auctores*', *Traditio*, 3 (1945), 215-64; R.W. Hunt, 'The Introductions to the *Artes* in the 12th Century', in *Studia mediaevalia in honorem reverendi patris R. Martin O.P.* (Bourges, 1948), 85-112.

[159] R.-A. Gauthier, 'Notes sur les débuts (1225-1240) du premier "averroïsme"', *Revue des sciences philosophiques et théologiques*, 66 (1982), 367-73. It is noteworthy that the Aristotelian schema also reached the realm of music theory in the fourteenth century. See notably Marchettus of Padua, *Pomerium*, ed. G. Vecchi, *CSM* 2 (Rome,1961), 31; Jacobus Leodiensis, *Speculum musicae*, VII, 3, p. 13.

[160] See *Abbreviatio in musicam,* 109; *Accessus Philosophorum,* 203-4.

[161] *Abbreviatio in musicam*, 112.

[162] See for instance the beginning of the third chapter: 'Tunc sequitur tertium capitulum in quo facit Boetius quinque : Primo ponit quasdam deffinitiones. Secundo ostendit […] Tercio ostendit […] Quarto ponit […] Quinto ostendit […]' (*Abbreviatio in musicam*, 113-4).

[163] On the Parisian commentary from 1230-60 see R.-A. Gauthier, 'Le cours sur l'ethica nova d'un maître ès Arts de Paris (1235-1240)', *AHDLMA*, 50 (1975), 75-77; Weijers, *Le maniement*, 42-4.

thirteenth-century abbreviations of Aristotle's works of Parisian provenance.[164] The pervasiveness of scholastic method abounds in the abbreviation of Book II of Boethius' treatise. Not only does the author of *Abbreviatio* confidently wield expressions characteristic of scholastic syllogistic argumentation (*sciendum quod*, *minor sic declaratur, arguo quod*, etc), but he also recasts some of Boethius' demonstrations into a rudimentary *questio*-form. To give but one example, the demonstration *per impossibile* in *De institutione musica* II, 22 about the ratio of the octave is restructured in the following way: 1) question: 'queritur de diapason utrum sit in multiplici uel in superpaticulari'; 2) first possibility: 'Si in multiplici, habetur propositum'; 3) second possibility: 'Si dicatur quod in superparticulari'; 4) refutation *per impossibile* of the second possibility; 5) conclusion.[165]

All the formal features outlined above clearly indicate that the *Abbreviatio in musicam Boecii* is a product of the Arts faculty of Paris, probably elaborated *c*.1230-1260. As such it provides valuable testimony for the study of music in this institution and deserves further scrutiny. As Meyer notes, the anonymous author of the *Abbreviatio in musicam* displays an in-depth knowledge of Boethius' *De institutione musica*.[166] By and large, his summary adheres to the *littera* of the treatise. Yet, on one occasion, the influence of the Arts faculty is clearly visible. For Boethius' *numerus relatus ad aliud* or *numerus ad aliquid relatus*, the anonymous author substitutes the newly construed definition of the subject matter of music elaborated by the Parisian masters of Arts, the *multitudo relata ad sonos*.[167] This substitution forces the abbreviator to distort Boethius' description of the *quadrivium* (*De institutione musica* II, 3) and to push the traditional Boethian subject for *musica* (the

[164] See for instance the *Abbreviatio in physicam* ascribed to an unknown Johannes Parisiensis in D-Mbs 26885, fols. 21r-28v.
[165] *Abbreviatio in musicam*, 119-121.
[166] Meyer, 'Un abrégé', 107.
[167] *Abbreviatio in Musica*, 109 and 117.

numerus relatus), into the realm of arithmetic as in the *Accessus Philosophorum*, *Compendium of Barcelona* or the *Questiones mathematice*.[168]

As with the basic handbooks, the anonymous abbreviator envisions Boethius' *De institutione musica* as a treatise on consonance. This conception, associated with a principle of economy, guides *de facto* his summary of the text. The abbreviator purges the text of its numerous repetitions and its side digressions. For instance, he excludes the inessential philosophical digressions on the nature and hierarchical order of consonances according to Plato, Hispasus, Eubulides, Nichomachus, etc.[169] It is noteworthy that most of the definitions that he quotes *verbatim* and that can be regarded as essential are the ones also found in the basic handbooks (definitions of consonance, dissonance, interval, sound, etc); they represent the sum of the essential notions that a student attending lectures on *musica* was expected to assimilate.

Also typical of the incisive and yet concise approach to Boethius' treatise in the *Abbreviatio in musicam* is a conscious endeavour to reduce the mathematical content to a minimum, wherever possible.[170] When they are not simply discarded, the fastidious and sometimes even mind-numbing arithmetical demonstrations of the treatise are condensed into remarkably lucid summaries. This is notably the case for the last chapters of Book II on the semitone. However, in contrast with the basic handbooks of the Arts faculty, after a concise and extremely legible demonstration, the anonymous author gives the correct ratios for the minor and major semitones.[171] As we have already seen, this aversion to computations characterizes the teaching of *musica* in the Arts faculty of Paris. It seems that the abbreviator pushes this attitude even further, so as to exclude from his summary several

[168] 'Multitudinis vero non relate ad sonos duplex est pars: quedam est multitudo absoluta non relata ad aliam multitudinem […] alia vero est multitudo ad aliam multitudinem relata [i.e. numerus relatus ad alium]' (*Abbreviatio in musicam*, 117). The *Accessus philosophorum* adopts a similar position: 'Non quod arismetica determinetur tantum de numero absoluto, immo determinatur etiam de numero ad aliquid relato quia in ea sunt omnium aliarum mathematicarum seminaria […].' (188).
[169] *De institutione musica*, I, 28-33 and II, 18-20.
[170] This point was noted by Meyer, 'Lectures et Lecteurs', 670.
[171] *Abbreviatio in Musica*, 121. See Boethius, *De institutione musica* II, 28-30.

chapters of Book II on the fundamentals of Pythagorean ratio theory. In lieu of these chapters the author of the *Abbreviatio in musicam* simply refers to Boethius' *De institutione arithmetica*.[172] These intertextual references are intriguing. They attest that the students attending lectures on the *De institutione musica* were presumed to have a prior knowledge of the *De institutione arithmetica*. The presence of a hitherto unnoticed abbreviation of Boethius' *De institutione arithmetica* in the two oldest manuscripts of the *Abbreviatio in musicam* corroborates this hypothesis.

Both Boethian abbreviations are in fact interrelated and probably the work of the same author. The *Abbreviatio in arithmeticam Boecii* opens like the *Abbreviatio in musicam*, with an *accessus* based on the four Aristotelian causes, and employs the same method to subdivide and synopsize Boethius' text. As in the *Abbreviatio in musicam*, the *Abbreviatio in arithmeticam* also privileges definitions over mathematical or philosophical sophistications. In addition, all the intertextual references to the *De institutione arithmetica* found in the *Abbreviatio in musicam* are carefully and extensively tackled in the *Abbreviatio in arithmeticam*. For instance, summarizing *De institutione musica*, II, 5-17 (on the rules of the generation of multiple and superparticular ratios and the description of proportional series), the author of the *Abbreviatio in musicam* explicitly refers to Boethius' *De institutione arithmetica* II, 1-3 and 40-53. These chapters are given pride of place in the *Abbreviatio in arithmeticam Boecii*, and the author of the latter abbreviation emphasizes their importance for musical speculations.[173] Finally, defining the *subiectum* of the discipline of music as the 'multitudo relata ad sonos', the author of the *Abbreviatio in*

[172] For instance: 'hoc dictum in Arismetica satis' (113), 'de qua satis est dictum in Arismetica'(117), 'in principio secundi Arismetice' (118).
[173] 'Tunc sequitur illa pars ubi documenta ponuntur ad musicam' (*Abbreviatio in arithmeticam*, GB-Ob Laud. misc. 644, fol. 136vb); or again 'In parte ista determinat Nichomachus de proportionibus et medietatibus que nobis utiles sunt, sicut dicit, ad musicam speculationes'(Ibid., fol. 138ra).

musicam adds 'ut prius dictum est'.[174] This clearly refers to the *Abbreviatio in arithmeticam* where the 'multitude related to sounds' is posited several times as the *subiectum* of music.[175]

In fact, more than being interrelated, the two abbreviations constitute a single textual unit. It would even seem that they were intended to be read one after the other – but for what purpose? As faithful digests of the *De institutione arithmetica* and the *De institutione musica*, their aim is evidently not to measure the content of these treatises against the background of Aristotelian philosophy, which would also explain the absence of polemical comments and of any references to Aristotle.[176] They appear above all as clear, well-crafted and concise substitutes for the official musical and arithmetical textbooks *de forma* in the Arts faculty. With selective adherence to Boethius' treatises and with succinct and insightful content, they would have been easier to use and better adapted to the needs and interests of an Arts classroom than the sometimes highly abstruse and technical original texts. Concerning music, the *Abbreviatio in musicam* presented students with a solid and coherent textual basis on which they could ground their knowledge of the discipline and its textbook. In addition, it indicates that the teaching of music at the Arts faculty was not limited to the resolution of such problems related to Aristotelian epistemology as the one found in the examination compendia or in Radulphus Brito's *Questiones mathematicales*. Part of the music lectures in the Arts faculty of Paris were probably also dedicated to the commentary on certain passages of Boethius' treatise.

Before turning to the best-known abbreviation of Boethius' *De institutione musica*, namely Johannes de Muris' *Musica Speculativa*, there remains the problem of the diffusion of the two Boethian tracts. The three surviving manuscripts of the *Abbreviatio in musicam* clearly indicate that it did not, at any event, gain a wide circulation. But the text was still

[174] *Abbreviatio in musicam*, 109.
[175] See for instance *Abbreviatio in arithmeticam*, fols. 133ra-b and 134ra.
[176] The only quotation from Aristotle is found in the accessus of the *Abbreviatio in Arithmetica* (fol. 133ra): 'Nam testante Philosopho libri *De anima* [I, 1 403b12-8] secantur scientie quemadmodum et res de quibus sunt scientie.'

copied in Northern France during the second half of the fourteenth century. The copy of the *Abbreviatio in musicam* transmitted in GB-Gu 461 is written in a neat late fourteenth-century Northern French (or perhaps Flemish) hand. In addition, the quires following the *Abbreviatio* contain the A/B version of Johannes de Muris' *Musica speculativa* as well as the Ps-Muris *Tractatus de proportionibus*, both copied in 1384 in Rouen by a certain Robertus Robillard documented as a master of Arts and a student in theology at the University of Paris in the 1370s. [177]

The fame of the *Abbreviatio in arithmeticam*, in contrast, reached unexpected heights. Originally written around 1230-1260, this tract was incidentally ascribed to Johannes de Muris around the end of the fourteenth century and formed, up to the eighteenth century, along with his *Musica Speculativa*, the core mathematical curriculum in many Central European universities. Indeed, the *Arithmetica speculativa* traditionally attributed to Muris and supposedly written by him around 1325,[178] is nothing other than the anonymous thirteenth-century *Abbreviatio in arithmeticam*.[179] Thus, contrary to what has hitherto been assumed, Johannes de Muris never wrote an abbreviation of Boethius' *De institutione arithmetica*. The *Arithmetica speculativa* associated with his name is in fact the *Abbreviatio in arithmeticam*, a tract composed around the middle of the thirteenth century by an anonymous Parisian master of Arts, and which was read on feast days in the Arts

[177] See C. Meyer, '*Per venerandae memoriae magistrum Iohannem de Muris*... La tradition parisienne de l'enseignement de Jean de Murs', in *Gedenkschrift für Walter Pass*, ed. M. Czernin (Tutzing, 2002), 219-220.
[178] This text is edited from incunabula by H. L. L. Busard, 'Die *Arithmetica speculativa* des Johannes de Muris', *Scientiarum Historia*, 13 (1971), 103-132.
[179] In short, I propose the following reconstruction that I will develop in a subsequent study. The *Abbreviatio in arithmeticam Boecii* first circulated in England with the *Abbreviatio in musicam*. The sole extant witness of this early circulation is GB-Ob Digby 191. In this manuscript the whole accessus to the *Abbreviatio in arithmeticam* has been replaced by an introductory paragraph consisting of juxtaposed quotations from Aristotle. This introductory paragraph was later replaced by a quotation from Johannes Pecham's *De numeris misticis*. With this new introduction, the *Abbreviatio in arithmeticam* was then copied with Johannes de Muris' *Musica speculativa*: two fourteenth-century English manuscripts (D-EF CA 2° 395 and CZ-Pak 1272) contain both the *Abbreviatio in arithmeticam* and the A version of Muris' treatise. At the end of the fourteenth century or at the beginning of the fifteenth, the two texts, joined together, were widely diffused on the Continent and prominently in Germany and Central Europe (both treatises are found in eight manuscripts from this area). At this point, probably because of its being joined to the *Musica speculativa* in the manuscripts, the *Abbreviatio in arithmeticam* was eventually ascribed to Johannes de Muris. It was finally printed under that and with the title *Arithmetica speculativa* in 1492.

faculty in conjunction with an abbreviation of the music textbook, the *Abbreviatio in musicam Boecii.*

Johannes de Muris' Musica Speculativa: A Textbook?

If Johannes de Muris never wrote an abbreviation of Boethius' *De institutione arithmetica*, his 'abbreviation' of the *De institutione musica*, the so-called *Musica speculativa*, secured his international reputation for centuries to come. Transmitted in no less than 54 manuscripts, Johannes' treatise survives in three versions.[180] The so-called A version of the *Musica speculativa* (1323) circulated chiefly in Central Europe in mathematical collections. The revision of this first text in 1325, probably by Muris himself, is known nowadays as the B version. This version enjoyed wide diffusion, mostly in Italian musical collections.[181] Finally the A/B version is a later conflation of the two other versions transmitted in four French mathematical collections dated from the beginning of the fifteenth century.[182] While the B version of Muris' *Musica Speculativa* was studied in Renaissance Italy by such eminent music theorists as Francesco Gaffurius,[183] by the end of the fourteenth century onwards, the A version of the *Musica speculativa* became the musical textbook in Central European universities where it was thoroughly and intensively studied, commentated, glossed and abbreviated.[184]

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[180] For the dates and the characteristics of the three versions see U. Michels, *Die Musiktrakatate des Johannes de Muris* (Wiesbaden, 1970), 17-24.
[181] On this see Hentschel, *Sinnlichkeit*, 266.
[182] GB-Gu 461, fols. 42v-65r (Rouen, 1384); I-Ma C 241 inf., fols. 126r-132v (Paris, 1401); D-B Ms. lat. fol. 600, fols. 2v-11r (France ?, 15th cent.); F-Pn lat. 7295, fols. 100v-110r (France, 15th cent.). Contrary to what is stated in *RISM*, 3/5 (121), E-Sc 5-3-23, fols. 91r-101v is not an A/B version of the *Musica Speculativa* but rather a B version. It is noteworthy that in all four manuscripts, the *Tractatus de proportionibus* based on Muris' teaching on musical proportions precedes the A/B version of the *Musica speculativa*. See Meyer, 'Per venerandae ', 222.
[183] A. Gallo, 'Lo studio della *Musica speculativa* di Johannes de Muris in Polonia e in Italia', in *Primo incontro con la musica italiana in Polonia* (Bologna 1974), 39-54.
[184] The official university texts mentioning Johannes de Muris' *Musica speculativa* are edited by G. Pietzsch, *Zur Pflege der Musik an den deutschen Universitäten bis zur Mitte des 16. Jahrhunderts* (Darmstadt, 1971), 17-8 [Prague], 26 [Vienna], 37-38 [Cracow], 67-8 [Leipzig], 113 [Erfurt], 121 [Rostock], 148 [Wittenberg]. On the reception of the text in Central European universities see notably C. Meyer, 'L'enseignement de la

Yet the role of the treatise at the Arts faculty of Paris remains unclear. Modern scholars assume that Paris opened the path to Central European universities and adopted Muris' treatise as its new musical textbook soon after the latter's composition and revision (1323-25).[185] Max Haas even claims that Johannes' treatise marked not only the renewal of musical studies at the Arts faculty but also the reintroduction of music into the curriculum after a long eclipse.[186]

At the time of the completion of the treatise, Johannes had just finished his two compulsory years of regency that all newly incepted masters of Arts at the institution were compelled to fulfil.[187] The start of his career as master would indeed have been an ideal time for the composition of a new music textbook. As in modern academia, in medieval universities there was fierce competition and young masters hastened to make a name for themselves. According to the testimony of Robert de Sorbon *c.*1260, theologian and founder of the Sorbonne, the competitiveness in Paris was so intense that many masters ceased to teach because they could not attract enough students.[188]

In addition, there seems to have been a need for a new music textbook. As Muris lamented, at that time, the books of the ancient philosophers, the books on music and on the rest of the *quadrivium* were no longer studied, under the pretext that they were too difficult

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musique dans les universités allemandes', in *L'enseignement de la musique au Moyen Age et à la Renaissance* (Royaumont, 1987), 87-95; E. Witkowska-Zaremba, 'I commentari universitari del quattrocento al trattato *Musica speculativa* di Johannes de Muris', in *Studi in onore di Giuseppe Vecchi*, ed. A. Gallo (Modena 1989), 179-186; Ead., 'Music Between *Quadrivium* and *Ars Canendi*: *Musica Speculativa* by Johannes de Muris and Its Reception in Central and East-Central Europe', in *Cantus Planus IV*, 119-126.

[185] Notably N. C. Carpenter, *Music in Medieval and Renaissance Universities* (Norman, 1958), 100; Haas, 'Studien', 352 and 413-5; Hentschel, *Sinnlichkeit*, 14; M. Huglo, 'L'enseignement de la musique à l'Université de Paris au Moyen Age', in *L'enseignement de la musique*, 79.

[186] Haas, 'Studien', 413-5.

[187] Johannes de Muris probably graduated in 1321. On Muris' biography see L. Gushee. 'New Sources for the Biography of Johannes de Muris', *JAMS*, 22 (1969), 3-26; and the more recent account by G. Di Bacco, *De Muris e gli altri. Sulla tradizione di un trattato trecentesco di contrappunto* (Lucca, 2001), 21-30.

[188] 'Vidi parisius multi magistri qui dimittebant legere quia non habebant multos auditores'. (Robert de Sorbon, *sermo ferialis*, F-Pn lat. 15971, fol. 176v; quoted in C. Haskins, *Studies in Medieval Culture* [Cambridge, 1928], 55).

and unintelligible.[189] This association of the *libri antiquorum philosophorum* with music and the *quadrivium* is reminiscent of the feast-day teaching as described in the 1215 statutes of the Arts faculty, a secondary curriculum which predominantly comprised the *libri philosophici* and the *quadruvalia*. Thus, Muris' *Musica speculativa* represents his response to the neglect by his contemporaries of the feast-day disciplines in general and of music in particular. Muris probably thought that, to rehabilitate musical studies at the Arts faculty of Paris, it was necessary to make the music textbook (i.e. the first two books of Boethius' *De institutione musica*) more accessible. To do so, he composed an 'axiomatised abbreviation' of Boethius' treatise couching the fundamentals of the Boethian-Pythagorean theory of consonance in a clearer mode of presentation. He also modernized and reinterpreted the content of the treatise by building his summary on four foundational principles or *petitiones* of Aristotelian inductive gnoseology.[190] In contradiction with Boethius' unconditional acceptance of the Pythagorean sovereignty of reason, the Aristotelian *petitiones* deem sense perception and experience to be prerequisites for universal knowledge and science. Thus, Johannes de Muris uproots the discourse of Boethian music theory from its Platonic-Pythagorean soil to reintegrate it within the overall framework of Aristotelian philosophy. Muris' achievement is indeed impressive. There is, however, no evidence that his *Musica speculativa* was ever part of the curriculum in Paris. May we then still picture a group of Parisian Arts students attending lectures on Johannes de Muris' *Musica speculativa* and taking formal examinations on passages from it?

The search for an answer to this question begins with one of the main arguments adduced for the elevation of *Musica speculativa* to the rank of a textbook at the Arts faculty

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[189] '[In] istis diebus libri antiquorum philosophorum nedum de musica, sed et de ceteris mathematicis non leguntur et ob hoc accidit eos tamquam inintelligibiles aut nimis difficiles abhorreri.' (*Musica speculativa*, A, 74; A/B, 4).

[190] 'Omnem doctrinam et omnem disciplinam ex praeexistenti cognitione fieri. Ante cognitionem sensitivam non aliam inveniri. Experientiae multiplici, ut in termino status acquiescere. Experientiam circa res sensibiles artem facere.' (*Musica Speculativa*, A, 90; B, 91; A/B, 20). For a detailed analysis of these four introductory *petitiones* in relation with the works of Aristotle, see Hentschel, *Sinnlichkeit*, 239-242.

of Paris. This argument can be encapsulated in the following syllogism: since the newly founded University of Prague prescribed ordinary lectures on the *Musica Muri* and since it was largely modelled on Paris, there must also have been lectures on Muris' treatise in the Arts faculty of Paris.[191] Now, a closer look at the early statutes of the Arts faculty of Prague evinces marked disparities with the Parisian institution. At Prague, music and the other quadrivial disciplines had to be taught during ordinary lectures and not on feast days.[192] We can recall that the statutes of 1378 from the Royal *Collège de Maître Gervais* unmistakably point out that mathematics was not, at any event, read *ordinarie* at the University of Paris.[193] If the Arts faculty of Prague departed from the Parisian custom regarding the organization of music teaching, one could surmise that this may also have been the case for the textbook on which this teaching was based. As already noted above, it would seem that, well into the fifteenth century, the Arts faculty of Paris like that of Oxford maintained the older usages and continued to employ Boethius' *De institutione musica* as a music textbook.[194] Thus, the inclusion of the *Musica speculativa* as well as more generally the reintegration of mathematical sciences into the main set of 'ordinary' lectures was a true innovation of the

[191] This is notably Carpenter's opinion (*Universities*, 100). According to the statutes (*c*.1380) three weeks minimum and a month maximum were necessary for the study of Muris' treatise in Prague: 'pro de sensu et sensato unus mensis ad maximum, minimum, infra quod non tres septimanae, similiter *pro musica Muri*' (Pietzsch, *Zur Pflege*, 18).

[192] 'in quadruvio sex libri Euclidis, arithmetica, *musica Muri* […] non debent legi diebus festivis' (Statutes of 1366 quoted in Pietzsch, *Zur Pflege*, 18). A good example of the teaching on Muris' *Musica speculativa* at the University of Prague is Wenceslas de Prachatitz's early fifteenth-century commentary on this text (partially edited by Pietzsch, *Zur Pflege*, 12-6). An earlier example from *c*.1360 might be the set lectures notes on Muris' *Musica speculativa* and the short treatise in 23 chapters inspired from the same text both transmitted in I-Rvat Pal. lat. 1380 (fols. 99r-102r and 163r-189r), a manuscript which once belonged to the Bologna-trained physician Reimbotus de Castro. Reimbotus was *c*.1360 the private physician of Emperor Charles IV in Prague, before he resumed his studies in law and theology at the University of Paris in 1367. On Reimbotus' career see L. Schuba, 'Reimbotus de Castro, Leibartzt Karls IV', *Miscellanea Bibliothecae apostolicae vaticana***,** 5 (1990), 287-293.

[193] 'Sed quia non legent [sc. scholares regis] ordinarie de dictis scientiis [sc. mathematicis], tenebuntur audire theologiam uel medecinam.' (Féret, *La faculté*, III, 635).

[194] For Oxford see the 1431 Statutes in Gibson, *Statuta*, 234. In his recent description of a fifteenth-century Parisian musical compilation by Georgius Erber (transmitted in A-Iu 962; *c*.1460), Christian Meyer noted the absence of Muris' *Musica speculativa*. See his 'L'enseignement de la musique à Paris au 15^{e} siècle. Un témoin inattendu: la compilation de Georgius Erber', in *Quellen und Studien*, 320. In his *Elementa Musicalia* (Parisii, 1496), Johannes Faber Stapulensis, master of the University of Paris and professor at the *Collège du Cardinal Lemoine* displays an impressive knowledge of Ancient music theory sources (most notably of Boethius). Though he structures his treatise using the Euclidian axiomatic method, he neither refers to nor quotes Johannes de Muris' *Musica speculativa*.

newly founded university of Prague. Because many Central European Universities espoused the Bohemian model (e.g. Vienna, Leipzig, Erfurt or Cracow), this innovation soon became the rule.

That Johannes de Muris' *Musica speculativa* did not integrate the Parisian Arts curriculum becomes even more apparent when the treatise is compared to the earlier *Abbreviatio in musicam Boecii*. The contrast between the two texts in terms of both form and content is staggering. As we have seen, the form and method of the *Abbreviatio in musicam* are plainly scholastic and they mirror those of the commentaries of the Parisian Arts faculty *c*.1230-1260. In comparison, the *Musica speculativa* is remarkably innovative. As already observed, Muris filters the content of the *De institutione musica* through the prism of Euclidian axiomatic method. 'The more beautiful conclusions belonging to the art of music'[195] as he says, are then presented with much clarity, conciseness and intelligibility in the form of 'propositions', 'petitions', 'theorems', 'conclusions' and 'corollaries'. The recourse to this mode of presentation clearly reflects Muris' own intellectual interests and training. Besides Euclid's *Elements,* a plethora of mathematical tracts adopted the Euclidian-like axiomatic structuring. In fact, by the end of the thirteenth century, this mode of exposition was the most important vector of mathematical expression.[196] Muris' assiduous engagement with this mathematical literature certainly influenced his own thought.[197] From the dim attempt to axiomatise rules of *musica mensurabilis* in the nine 'conclusions' of his *Notitia artis musice* (1319-21) to the utterly impressive sophistications of his *De arte mensurandi* (after 1345), he always used axiomatic structuring as one of his preferred modes of mathematical expression.

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[195] 'Conclusiones pulcriores ad ipsam artem musicae pertinentes cum sermonis claritate et evidentia sententiae manifestare conabor.'(*Musica speculativa*, A, 74; A/B, 6).

[196] For a useful list of the numerous late medieval mathematical texts cast in an axiomatic form, see Hentschel, *Sinnlichkeit*, 253-256.

[197] Marshall Clagett ('The Use of Moerbeke Translations of Archimedes in the Works of Johannes de Muris', *Isis*, 43/3 [1952], 246-52) showed, for instance, that Johannes de Muris was the first to quote William of Moerberke's translations of Archimedes' *De lineis spiralibus*, a treatise cast in an axiomatic form.

However, Muris is an exception among the Parisian masters of Arts. Indeed, textual commentary and *questio* were still, in the first half of the fourteenth century, relentlessly and endlessly practised and pondered by a majority at the Arts faculty. It is only one generation after Johannes de Muris, most prominently in the works of Johannes Buridan, Albert of Saxony and Nicole Oresme, that the traditional modes of expression of the scholastic *questio* gradually started to incorporate axiomatic elements (conclusions, suppositions, corollaries).[198] That being said, it is therefore highly improbable that in the 1320s an axiomatised treatise such as *Musica speculativa* became a textbook for an institution where the kind of textual exegesis practiced had not, on the whole, evolved since the second half of the thirteenth century.[199]

When we turn to the content, divergences between the *Abbreviatio in musicam* and the *Musica speculativa* grow even more conspicuous. The *Abbreviatio in musicam* is essentially definitional. It is largely anchored in the *littera* of the first two books of *De institutione musica* while, at the same time, it avoids arithmetical digressions. The A version of Johannes de Muris' *Musica speculativa* unfolds along completely opposite lines. Definitions in the treatise are limited to a minimum (a few canonical definitions of consonance and definitions of the melodic genera). This lack of definition was certainly perceived as a problem because in the B version, Muris (or someone else) substituted for the Aristotelian proem about the ethical and political importance of music, a long passage from Muris' own *Notitia artis musicae*.[200] In effect, this passage presents a general definition of music as a science dealing with the *numerus relatus ad sonos*, a description of the five

[198] See M. Lejbowicz, 'Logique, mathématiques et contre acculturation dans l'université médiévale', in *La nouvelle physique du 14^e siècle*, ed. S. Caroti (Florence, 1997), 227-9.
[199] On the evolution of the *questio*-form at the Arts faculty of Paris see O. Weijers, *La disputatio dans les facultés des Arts au Moyen Age* (Turnhout, 2002), 18-76.
[200] *Musica Speculativa*, B, 77-89; A/B, 8-20; *Notitia artis musicae*, ed. U. Michels, *CSM* 17 (n.p., 1972), 49-53.

different kinds of ratios and an Aristotelian definition of sound intertwining descriptions from Aristotle's *De anima* (II, 8) and from Boethius' *De institutione musica* (I, 3).

In correlation, Muris' focus is almost exclusively mathematical. Not only does he concentrate on the numerical ratios of the principal consonances, but he also determines the ratios for subtonal intervals. Furthermore, topical demonstrations of Boethian music theory (such as the non-divisibility of the whole tone into two equal halves or the impossibility that the octave be composed of six whole tones) are given pride of place and they are illustrated with numerous didactical diagrams through which 'the truth that lies in the intellect becomes sensible'.[201]

Rather than closely following the first two books of Boethius' *De institutione musica* as in the *Abbreviatio in musicam*, Johannes de Muris integrates elements drawn from the other books of the treatise such as the division of the monochord in the diatonic genus from Book IV, 5.[202] Furthermore, he develops his own personal and original readings of Boethius' treatise. We have already mentioned how Muris interweaves threads of Aristotelian philosophy into the wrought fabric of his treatise. In at least two other passages he does not refrain from plunging into the technicalities of the treatise while bringing a practical musical element into his interpretation. After having described Boethius' division of the monochord, for practical reasons Muris proposes his own division, extending the monochord from 15 to 19 notes, a number that undoubtedly recalls the 19 notes of the gamut and their association to the solmisation syllables of the different hexachords on the 19 junctures of the Guidonian hand.[203] Secondly, Muris' long digression on the problem of the inclusion of the eleventh or

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[201] '[figurae sensibiles] multum placent mathematicis, quoniam veritas, quae est in intellectu, per eas ad iudicium visus et auditus conformiter reducta est.' (*Musica Speculativa*, A, 250; only in the A version). This reference to the senses of sight and hearing echoes the proem of the A version where Muris, following Aristotle (*Metaphysics* I, 1, 980b15-25 and *De sensu et sensato*, 437a4-16), proclaims the importance of sight and hearing in the acquisition of knowledge. On this see Hentschel, *Sinnlichkeit*, 241-6.

[202] For Muris only the diatonic *genus* is universally practiced throughout Christendom (including in measured music) whereas the two others are not only unpleasant to the ear but also 'quasi contra naturalem inclinationem humanarum vocum'. See *Musica speculativa*, A, 262-4; B, 263-5; A/B 288-92.

[203] *Musica Speculativa*, A, 282; B, 283; A/B, 344.

diapason cum diatessaron among the primary consonances constitutes the best example of an original rewriting of Boethius' treatise.[204] For Muris, to exclude the interval of the eleventh as the Pythagoreans did was tantamount to saying that in a three-voice setting a fourth+fifth is not consonant whereas a fifth+fourth is.[205] The link with the aural and practical dimensions of music is obvious here. Muris' interpretation gives a theoretical authorisation to the gradual exclusion of the two-voice sonority of a fourth and the three-voice sonority of a fourth+fifth from polyphonic music in the fourteenth century. At the same time, his affirmation that the three-voice sonority of a fifth+fourth is the best and the sweetest (*optima*) clearly reflects the usages of contemporary polyphony where, as Sarah Fuller showed, this prevalent sonority served as a pillar of pitch structure and as a bearer of the syntactical articulation, notably through 'directed progressions' of the type $X^3_6\ Y^5_8$.[206]

What would the average student of the Arts faculty of Paris have made of Muris' abbreviation of Boethius' *De institutione musica*? Muris' digressions on the eleventh, on the monochord or on the ratios founding subtonal intervals might have appeared as technical exotica for the average Arts student accustomed to commentating on Aristotle and to resolving *sophismata*, *insolubilia, obligationes, consequentiae* or other logical or natural philosophical conundrums. No doubt the *Abbreviatio in musicam* or the sections on music in the introductory literature of the Arts faculty would have been easier to comprehend than Muris' treatise.

The approach to Boethius' *De institutione musica* in *Musica speculativa* is almost antithetic to that of the *Abbreviatio in musicam* and the other sources from the Arts faculty. Perhaps Muris' introductory remarks deploring the neglect of *musica* and the *quadrivium* must be reinterpreted with a view to the context of the teaching of these disciplines on the

[204] On this passage see Hentschel, *Sinnlichkeit*, 205-211.
[205] *Musica Speculativa*, A, 218-222; B, 219-223; A/B, 226-230.
[206] See S. Fuller, 'On Sonority in Fourteenth-Century Polyphony: Some Preliminary Reflections', *JMT*, 30/1 (1986), 35-70; and Ead., 'Tendencies and Resolutions: The Directed Progression in "Ars nova" music', *JMT*, 36/2 (1992), 231-2.

feast days. As a true mathematician rather than a logician, Muris was certainly tired of practising mathematics and speculative music theory without numbers and computations. The *Musica speculativa* could well represent the response of a young master who wanted to reform the teaching of mathematics at the Arts faculty of Paris. It could derive from a set of lectures on Boethius' *De institutione musica* that the young master Johannes de Muris gave in this institution, in as much as the very didactic *Arbor Boecii* (1324) may derive from Muris' lectures on Boethius' *De institutione arithmetica*.[207] Thus, had the *Musica speculativa* become the new textbook of the Arts faculty, this would have implied a momentous rupture in the musical interests and habits of the masters of Arts, an unlikely move knowing the propensity of the University to resist curricular changes.[208]

This does not imply that the *Musica speculativa* could not have been used as teaching material to supplement lectures on the first two books of Boethius' *De institutione musica* or to satisfy the extracurricular musical interests of some students. Christian Meyer has recently shown that the so-called A/B version of the treatise was probably 'edited' in Paris sometime during the second half of the century, shortly after the death of Johannes de Muris.[209] As we have already seen, the four extant manuscripts of this version have obvious Parisian connections. Yet it has hitherto been overlooked that the *Tractatus de proportionibus* voluntarily appended to the *Musica speculativa* in these four manuscripts is in fact based on Muris' *Arbor Boecii*.[210] The A/B version of the *Musica speculativa* with its preface on speculative arithmetic, the *Tractatus de proportionibus*, may have then

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[207] The *Arbor Boecii* is transmitted in D-EF Amp. Fol. 377, fols. 35v-36r and F-Pn lat. 16621, fols. 63v-64r. The explicit of the latter manuscript reads: 'Hec est arbor Boecii de arte numerorum sumpta de libro arismetrice ordinata 1324 domo scolarium de Sorbona Parisius per magistrum Johannem de Muris.' The *Arbor Boecii* consists in four synoptic tree-diagrams: one for the various species of the *numerus absolutus*, one for the various species of the *numerus relatus*, one for the *numerus quae in figuris geometricis consideratur*, the last diagram deal with fractions and has nothing to do with Boethius' treatise.

[208] For instance the 'up-dating' of the curriculum in logic and grammar in the fourteenth century took several decades. See I. Rosier and S. Ebbesen, 'Le trivium', 122-4.

[209] Meyer, 'Per venerendae', 221-222.

[210] The *Proportionum numeralium* (edited in Meyer, 'Per venerandae', 227-231) copies and glosses the tree-diagrams of the *numerus absolutus* and the *numerus relatus* from the *Arbor Boecii* (see F-Pn lat. 16617, fol. 64r).

constituted a perfect guide for the most daring masters of the Arts faculty of Paris who followed the path cleared by Johannes de Muris, and opted for a more modern approach to Boethius' *De institutione musica*.

Conclusion

At the end of this chapter, several major conclusions can already be drawn on the teaching of music at the Arts faculty of Paris. First of all, contrary to what was thought, it appears that music as a quadrivial discipline was continuously taught in the thirteenth and the fourteenth centuries. It is true that in comparison with the disciplines that formed the core teaching of the Arts faculty (logic, grammar, and later natural philosophy), *musica* occupied a secondary and even, minimal place in the curriculum. Music lectures took place on feast days and had to compete with the rest of the *quadrivium* and with several other disciplines (in the thirteenth century rhetoric, ethics and the 'philosophers', and from the middle of the fourteenth century, Aristotle's treatises on moral philosophy). This feast-day teaching was first made official by the University in the Courson statutes of 1215 and was still customary in the fifteenth century. It took place essentially in the schools of the *Rue du Fouarre*, though it is also possible that certain masters organised lectures in their houses, which they often shared with students. In addition, in the fourteenth century, two or perhaps three Colleges also offered complementary instruction in music and mathematics.

The teaching of *musica* at the University of Paris was not only official but also compulsory as the *de forma* prescriptions indicate. It was conducted using the first two books of Boethius' *De institutione musica*, an innovation of the Arts faculty of Paris. Contrary to what has been assumed, Boethius' treatise remained the official music textbook in this institution up until the fifteenth century and perhaps beyond. Johannes de Muris'

Musica speculativa never became a textbook as was previously thought, even though it was elevated to this status in the newly founded universities of Central Europe where it was studied during 'ordinary lectures'. Originally composed as a set of lectures on music when Muris was himself a newly incepted master of the Arts faculty of Paris, the *Musica speculativa* proposed a new and thorough approach to Boethian music theory by weaving together in a single intricate fabric, Pythagorean mathematics, Euclidian method and Aristotelian epistemology. Yet it would seem that the complex mathematical sophistications and practical musical overtones of the treatise did not quite suit the needs and interests of the average member of the Arts faculty.

Indeed, the examination compendia (*c*.1240-50) and Radulphus Brito's *Questiones mathematicales* (before 1299) demonstrate that part of the music teaching concentrated exclusively on epistemological matters: particularities of music as a science, its place in the general partition of knowledge and the definition of its *subiectum*. Similar epistemological preoccupations are also apparent in the basic handbooks, intertwined with a few definitions of consonance directly drawn from the treatise itself. Aristotelian logic and natural philosophy were more useful for the elucidation of these questions than a thorough knowledge of the first two books of Boethius' *De institutione musica*. Nonetheless, music lectures were not limited to these epistemological issues. Other sources such as the Harley compilation or the *Abbreviatio in musicam Boecii* indicate that another part of the teaching of music at the Arts faculty of Paris focused on Boethius' text itself envisioned as a treatise on musical consonances. In the *Abbreviatio in musicam* dated *c*.1230-1260, the first two books are sifted through the mesh of the targeted interests of the Arts faculty's members. The arithmetical content of the first two books is reduced to a minimum and the passages of the treatise about consonance theory are carefully selected, truncated, abridged and rewritten. Yet how these selected passages were commentated upon and discussed in the classroom is a question that must be held in suspension until all the hitherto unpublished

thirteenth- and fourteenth- century sets of glosses on Boethius' *De institutione musica* are brought under a thorough and careful analysis.

CHAPTER 2

THIRTEENTH- AND EARLY FOURTEENTH-CENTURY GLOSSES ON BOETHIUS' *DE INSTITUTIONE MUSICA*

The first two books of Boethius' *De institutione musica* constituted the only music text *de forma* at the Arts faculty of Paris. We have seen how compilations of excerpts and abbreviations of the treatise were elaborated in the thirteenth and fourteenth centuries, indicating that the latter was subject to study. In order to complete the inquiry into the material remains of the study of Boethius' *De institutione musica* at the Arts faculty of Paris, a last aspect needs to be investigated, namely the glosses on the treatise.

Whether marginal or interlinear, glosses are probably the most direct testimonies of the struggles to interpret a text. They can be the record of teaching activities in a classroom or of a more personal study of the text.[1] As is well known, the *De institutione musica* was the object of perennial and continuous glossing throughout the Middle Ages, which materialized into an impressively voluminous corpus of glosses penned in the margins and interlinear spaces of most of the 220 surviving manuscript copies of the treatise.[2] The recent work of Michael Bernhard and Calvin Bower has allowed for the clearing of a considerable portion of this entangled, dense and luxuriant textual forest. Their edition of the so-called *Glossa maior* has provided fascinating insight into how several interpretative apparatus for

[1] A general appraisal of the medieval glossing practice in philosophical texts is provided by E. Jeauneau, 'Gloses et commentaires de textes philosophiques (9e-12e)', in *Les genres littéraires dans les sources théologiques et philosophiques médiévales. Actes du colloque international de Louvain-la-Neuve, 25-27 mai 1981* (Louvain, 1982), 117-31. See also the interesting issues on the role of glossing in the medieval classroom in G. Wieland, 'The Glossed Manuscript: Classbook or Library Book?', *Anglo-Saxon England*, 14 (1985), 153-74.

[2] For an excellent overview of the reception of the text in the Middle Ages, see A. White, 'Boethius in the Medieval Quadrivium', in *Boethius. His Life, Thought and Influence*, ed. M. Gibson (Oxford, 1981), 162-205; M. Bernhard, 'Glosses on Boethius' *De institutione musica*', in *MTIS*, 136-149. Short codicological descriptions of all the extant manuscripts of the treatise are given in C. Bower's invaluable 'Boethius' *De institutione musica*. A Handlist of Manuscripts', *Scriptorium*, 42 (1988), 205-251.

the text developed from the ninth to the twelfth century, in accordance with the interests and expectations of the readerships of many monastic and cathedral schools.[3]

However, the history of the reception of the text for the thirteenth and fourteenth centuries remains largely a *selva oscura*. It is true that recently more attention has been given to the vicissitudes of the *De institutione musica* during this period. Editions of some important Boethian material have finally been published. In addition to the thirteenth-century *Abbreviatio in musica Boecii* and Johannes de Muris' *Musica speculativa*, the only two extant continuous commentaries on the treatise have also been edited. The first commentary is transmitted in a single thirteenth-century source, the manuscript A-SF XI 28. Recently edited by Alexander Rausch, this incomplete commentary of Boethius' treatise still awaits a complete doctrinal study.[4] Max Haas has proposed a date *c*.1100 for this text but fails to provide any convincing evidence to support his claim.[5] Without entering into details here, several features of the commentary point rather towards the second half of the twelfth century and towards a Northern French cathedral or monastic school under the pervasive influence of the so-called 'Chartrian Platonism': notably, the particular structure of the *accessus* introducing the commentary, the technique of 'lemmatic' or 'catena' commentary and numerous philosophical allusions and references to Chartrian Platonic doctrines.[6] The second commentary on Books I, II and IV has been rightly located by its recent editor Matthias Hochadel in the milieu of the late fourteenth- or early fifteenth-century University of Oxford.[7]

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[3] *Glossa Maior in institutionem musicam Boethii*, eds. M. Bernhard and C. Bower, 3 vols. (Munich, 1993-6) [hereafter *GM*].

[4] A. Rausch, 'Der Boethius-Kommentar in der Handschrift St. Florian XI 282', *Studien zurMusikwissenschaft*, 48 (2002), 7-83. Only the commentary on Book I and on the beginning of Book II is extant.

[5] M. Haas, 'Studien zur mittelalterlichen Musiklehre I: Eine Übersicht über die Musiklehre im Kontext der Philosophie des 13. und frühen 14. Jahrhunderts', *Forum Musicologicum*, 3 (1982), 338.

[6] A doctrinal study of this commentary will be developed in a subsequent study.

[7] *Commentum Oxoniense in musicam Boethii. Eine Quelle zur Musiktheorie an der spätmittelalterlichen Universität*, ed. M. Hochadel (Munich, 2002). This commentary is preserved in two fifteenth-century manuscripts of English provenance: GB-Ob Bodley 77 and GB-Oas 90.

In addition to these editions, only a few studies have concentrated on the impact of Boethius' treatise in the thirteenth and fourteenth centuries. Christian Meyer recently proposed an overview, the only one so far, of the thirteenth-century reception of the treatise.[8] The recent studies by Eva Hirtler and Frank Hentschel have shown the persistence of the perennial Pythagorean heritage and the tutelary presence of Boethius in fourteenth-century music theory.[9]

Yet, none of these studies has systematically tackled the issue of the glosses on Boethius' treatise for this period.[10] In fact, the chapter in the history of the medieval reception of Boethius' *De institutione musica* for the thirteenth and fourteenth centuries must still be written. Perhaps, the notable decline in the manuscript production of the treatise at the close of the Middle Ages is responsible for such a lack of interest.[11] However, there are references to three or perhaps four now lost commentaries on the *De institutione musica* written during this period: one is ascribed to Johannes de Muris, another to a 'commentator lincolniensis', a third one to Albertus Magnus,[12] and finally the anonymous *Commentum super musicam* with the incipit 'quoniam musica non solum' listed in the fourteenth-century catalogue of the Sorbonne library can either be identical with one of these three commentaries or represent a fourth one.[13]

In addition, about a dozen of the thirty or so manuscripts produced during these two centuries are more or less extensively and consistently glossed. These glosses are invaluable vestiges of the hermeneutic endeavours of the readerships that studied the text. It is more than likely that some of these readers evolved within or around a university milieu. Thus, a

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[8] C. Meyer, 'Lectures et Lecteurs du *De institutione musica* de Boèce au 13e siècle', in *Boèce ou la chaîne des savoirs*, ed. A. Galonnier (Louvain, 2003), 665-678.
[9] E. Hirtler, *Die Musik als scientia mathematica von der Spätantike bis zum Barock* (Frankfurt, 1995), 67-142; F. Hentschel, *Sinnlichkeit und Vernunft in der mittelalterlichen Musiktheorie* (Stuttgart, 2000), *passim*.
[10] Christian Meyer ('Lectures et lecteurs', 675) only devotes a paragraph to the glosses of F-Pn lat. 18514.
[11] See the graph representing the evolution of the manuscript production of the *De institutione musica* from the ninth to the fourteenth century given by M. Huglo, 'The Ancient Sources of Music Theory in the Medieval Universities', in *MTIS*, 167.
[12] See M. Hochadel, 'Einleitung', in *Commentum Oxoniense*, lxxxii.
[13] Hentschel, *Sinnlichkeit*, 277.

careful study of the thirteenth- and fourteenth-century glossed copies of Boethius' *De institutione musica* will prove crucial for our inquiry into the teaching and study of music theory at the Arts faculty of Paris during this period. Correspondingly, it will also help to write the missing chapter in the history of the reception of the treatise: a chapter that coincides with the rise of Aristotelianism in the West and its institutionalisation in the nascent university.

Such a study raises a salvo of important questions that will be placed at the heart of the present chapter: Do some of these hitherto unstudied sets of glosses represent actual testimonies of formal teachings on the *De institutione musica* in the classrooms of the Arts faculty of Paris, or perhaps, of another university? Did the new institutional setting of the University, and the correlative shift in philosophical paradigms linked to the gradual diffusion of Greco-Arabic peripatetism, foster new attitudes to the *De institutione musica* similar in kind to those already analyzed in Chapter 1? What do these new problematics and doctrinal orientations tell us about the competences and the preoccupations of those who composed the glosses as well as the reasons for which they did so? In other words, can we infer from these glosses a reading of the treatise typical of the Arts faculty and its teachings?

To answer these questions, it is first imperative to delimit a corpus of thirteenth- and fourteenth-century glossed copies to be studied. Several manuscripts have been discarded mainly because they lack substantial glosses or glosses of interest.[14] In contrast, copies that we know were preserved in the collegial libraries of Paris and Oxford must be given particular attention. The inclusion of manuscripts now at Oxford can easily be justified: intellectual exchanges and a free circulation of scholars and manuscripts between the universities of Paris and Oxford were frequent in the thirteenth century. Certain glosses may

[14] They include: GB-Oc 224, fols. 142r-188v (Bower, no. 75; *CB*, I, no. 212); GB-Cssc 31, fols. 98v-119r (Bower, no. 16, *CB*, I, no. 49); PL-Kj 1849, fols. 1r-38v (*CB*, no. 34). I have been unable to consult I-Pc 414, fols. 35-79 (Bower, no. 23; *CB*, III, no. 257), which according to Calvin Bower, contains a gloss referring to Aristotle's *De anima*. The number in brackets refers to Bower's 'Handlist'. *CB* stands for *Codices Boethiani*, eds. M.T. Gibson and L. Smith (London, 1994-).

indeed reveal preoccupations common to both the Parisian and the Oxonian Arts faculties. Among these 'university manuscripts', the two surviving manuscripts of Boethius' *De institutione musica* listed in the fourteenth-century catalogue of the Sorbonne library will be put aside. Indeed, as Michael Bernhard has already noted, they exhibit few signs of use and only a few unoriginal glosses, all borrowed from the 'central tradition' of the *Glossa maior*.[15]

The corpus thus delimited contains no more than six manuscripts:[16]

F-Pn lat. 18514, fols. 1r-85r (Bower, no. 101), hereafter P

According to Christian Meyer, this manuscript, copied from a Norman exemplar, may have originated in South West France.[17] It was then relocated to the library of the College of Navarre in the fourteenth century. Glosses in this copy are in a neat thirteenth-century book-hand containing only very few abbreviations. Judging from the perfect alignments between glosses and main text, Meyer suggests that both were copied at the same time.[18] The *De institutione musica* is sparsely but consistently glossed throughout. At a first glance, the glossator seems to concentrate on key mathematical problems raised in Books II, III and V. Besides the *De institutione musica*, this manuscript contains a text recently identified by Meyer as a *reportatio* of the teachings of Johannes de Garlandia on *musica plana*. Because of an ambiguous title (*Tractatus de musica lectus ex his que sunt a Boethio supra atque declaratio musice pratice*), this tract was frequently associated with the Boethian tradition. Unfortunately, apart from being bound together, the Garlandian tract and the glosses on the *De institutione musica* have nothing in common. It is therefore impossible to forge a direct link between this set of marginalia and the teaching of the influential music theorist Johannes de Garlandia.

GB-Obac 306, fols. 46r-89r (Bower, no. 72; *CB*, I, no. 207), hereafter B_1

Written in the second half of the twelfth century in Northern France, this copy of the *De institutione musica* exhibits complex and multi-layered sets of marginalia. It is impossible to determine when B_1 reached England, but it once belonged to the fourteenth-century Oxford mathematician Simon Bredon, fellow of Merton College from 1330 to 1348.[19] The *De institutione musica* exhibits great signs of use and active reading. It bears the marks of several glossing campaigns. At least five different hands are discernible, ranging from the

[15] The two manuscripts are F-Pn lat. 16021, fols. 83r-241v (Bower, no. 98) and F-Pn lat. 16652, fols. 43r-95r (Bower, no. 99). See Bernhard, 'Glosses', 147; Haas, 'Studien', 338 and 366. In the fourteenth century, the Sorbonne library also possessed two other copies of the treatise now lost or not yet identified. See Hentschel, *Sinnlichkeit*, 273-77.

[16] For more detailed codicological descriptions see the *Codices Boethiani* or Calvin Bower's handlist. Elements for dating and origin are Bower's unless stated otherwise.

[17] See the codicological description of this manuscript in Johannes de Garlandia, *Musica plana*, ed. C. Meyer (Baden-Baden, 1998), xi-xii. The Norman connection is suggested by the presence of an unusual explicit found in other manuscripts from Normandy: 'musica invidia longobardorum nondum finita'.

[18] Ibid.

[19] For a detailed physical description of the manuscript see A.G. Mynors, *Catalogue of the Manuscripts of Balliol College, Oxford* (Oxford, 1963), 324-5. On Simon Bredon, see C.H. Talbot, 'Bredon, Simon', in *Dictionary of Scientific Biography* (New-York, 1970), II, 435.

late twelfth to the fourteenth century. It is clear that the first glossing hand (A) is contemporaneous with that of the treatise and is, in all likelihood, French. Apart from a few interlinear word glosses, most of hand A's marginal comments copy quasi-verbatim glosses from the *Glossa maior* (around 25 for the first two books of the treatise). A preliminary analysis of these glosses shows a close relation to the so-called French tradition of the *Glossa maior* and even more precisely to a family of Northern French manuscripts.[20] A second important hand (B), in light brown ink, could be dated from the first half of the thirteenth century. The glosses of hand B are original and unique to B_1. They will therefore be the focus of our attention here.

GB-Obac 317, fols. 4r-72r (Bower, no. 73; *CB*, I, no. 208), hereafter B_2

Another late twelfth-century copy of Boethius' *De institutione musica*, this time of English or Flemish provenance, was bequeathed after 1276 to Balliol college library by Petrus de Cosyngton, a master of Arts who graduated from Oxford probably before 1238.[21] In this manuscript the *De institutione musica* is truncated at the beginning of Book V. Marginal and interlinear glosses, though present on nearly every folio of this manuscript, become less dense and less extensive from Book IV onwards. Both marginal and interlinear glosses are written in a minute thirteenth-century script. In comparison with B_1, B_2 is far less densely glossed and only one hand is responsible for all the *marginalia*.

GB-Ob Ashmole 1524, part C, fols. 1r-46v (Bower, no. 68; *CB*, I, no. 162), hereafter O and I-Ma Q9 Sup, fols. 1r-60v (Bower, no. 53; *CB*, III, no. 207), hereafter M

O is a *Sammelcodex* containing six parts, different in date and origin, which were bound together in Early Modern times. The part containing the *De institutione musica* can be dated to the second half of the twelfth century and is of Flemish or Northern French origin. It is not known when this part of O reached Oxford. Numerous and extensive glosses are written in the margins in a minute thirteenth-century script. Most of the marginal glosses of O are attested in another twelfth-century copy of the *De institutione musica*, M, from Christ Church, Canterbury. However, the glosses of M are written in a fourteenth-century Italian hand. The presence of certain glosses specific to M and others specific to O indicates that the two manuscripts were copied from a common archetype. The scribes of O and M voluntarily selected and omitted certain glosses from this archetype. The OM glosses, as we shall now call them, run from Book I to IV of the *De institutione musica* – the first two books receiving only a little more attention than the last two ones. Opposite the first folio of the treatise and written in the same hand as the glosses, O contains a *divisio textus* describing the overall articulation of the first Book of Aristotle's *Posterior analytics*.[22] The rather incongruous presence of these lines already hints at a link between this anonymous set of glosses and the university milieu where the Aristotle's treatise was part of the curriculum.

[20] More particularly, the glosses in B_1 show some noticeable textual affinities with the following manuscripts: US-Cn F. 9; GB-Lbl Royal 15. B. IX; F-Pn lat. 7297; I-Rvat Reg. lat. 1005; I-Ma C 128 inf. and F-AUT 46.

[21] For a description of this manuscript see Mynors, *Catalogue*, 344-6. On Petrus de Cosyngton see A.B. Emden, *A Biographical Register of the University of Oxford to A.D. 1500* (Oxford, 1957-9), I, 530.

[22] 'Prima pars libri posteriorum, id est primus liber, dividitur in tres partes. In prima parte agitur de resolutione demonstrationis in sua principia et de principis demonstrationis. In secunda, tractatur de distinctione demonstrationis simpliciter a demonstratione secundum quid. In tertia, de differentia demonstrationis simpliciter et secundum quid a definitione et istud capitulum dividitur per tres terminos: per sensibilem, opinabilem et a fortuna et casu - ultimo autem determinatur primo de sollertia et sic finitur primus tractatus. In secundo autem agitur de modo demonstrandi.' (O, fol. 1r; this short summary lacks in M).

GB-Oc 118, fols. 3r-56v (Bower, no. 74; *CB*, I, no. 211), hereafter C

This manuscript comprises three separate parts. The first part of the manuscript contains a thirteenth-century copy of Boethius' *De institutione musica*. According to Matthias Hochadel, the text of this manuscript bears strong affinities with a group of codices of the treatise copied at Christ Church, Canterbury.[23] The most prominent hand in this set of glosses is from the late thirteenth or early fourteenth century. It is quite remarkable that all the glosses are located in Books I and II. This unmistakable and exclusive emphasis on the first two books of the treatise strongly recalls the *de forma* prescription typical of the Parisian university curriculum. Two other features further support a connection between this set of glosses and the University. Firstly, the impressive display of authoritative texts on natural philosophy (essentially by Aristotle and Averroes) in these glosses clearly points towards the university milieu. Secondly, on the word *theatralibus* the anonymous glossator exclaims: 'malum est choreas ducere et ideo prohibantur in examinationibus'.[24] As festive gatherings punctuated with banquets, heavy drinking and general rejoicing, the various rites of passage of the university world (including the examinations) were indeed a propitious ground for such 'depravations' as the carols. At the University of Paris (*c*.1280), the candidates to the *inceptio* had to swear that they would not lead any carols under the penalty of being expelled from the corporations of masters: 'non sustenebitis choreas duci extra domum vestram, nec inhonestam fieri in principio vestro sub pena degradationis magisterii.'[25]

The succinct description of these six manuscripts already captures the heterogeneity of thirteenth- and fourteenth-century anonymous sets of glosses. To analyse such a disparate corpus it is important to establish common criteria of classification. Rather than follow the five-fold taxonomy propounded by Bower and Bernhard in their edition of the *Glossa maior*, a tripartite classification seems more appropriate for our purpose.[26] Though artificial, the three categories of glosses set forth yoke together the different copies of Boethius' *De institutione musica* under scrutiny. They also fulfil a heuristic function by helping to answer the questions at the heart of this chapter.

The first category contains all the glosses of an exegetical nature, that is, those glosses designed to ease the reading of Boethius' treatise by segmenting the text into reading units, underlining the logical progression of the argument or summarizing the essential points. These glosses are crucial to understanding the transmission of the treatise

[23] Hochadel, 'Einleitung', xxxi.
[24] C, fol. 3v; also quoted in Hochadel, 'Einleitung', xxxiii.
[25] *CUP*, I, no. 501. Similar regulations are also found in the statutes of numerous Parisian Colleges, for several examples see below Chapter 5.
[26] Bower and Bernhard, 'Introduction', in *GM*, I, xliv-xlvii.

and help characterise the audience implied by the glossators. The second category of glosses is concerned with mathematical comments. In these digressions, the glossators usually have recourse to the other sciences of the *quadrivium* to explain the *De institutione musica*. The links thus established between Boethius' treatise and other mathematical disciplines and textbooks will define the role played by music in an eventually unified program of quadrivial teaching at the Arts faculty. Finally, the third category of glosses that will retain our attention contains all digressions of a philosophical nature. More particularly, the focus will be on those remarks that may reveal to what extent the anonymous glossators of our corpus interpreted Boethius through the prism of Aristotelian logic and natural philosophy. Since the Aristotelian corpus overwhelmingly dominated the university curriculum, implicit or explicit references to the Philosopher will help secure connections between certain sets of glosses on *De institutione musica* under scrutiny and the Arts faculty. Such references will also help assess the impact that the philosophical renaissance just beginning had on the teaching of *musica*.

Exegetical Glosses

The 'exegetical glosses' encompass those marginal comments that facilitate the reading of the text by outlining the logical structure of Boethius' argument. Glosses of this kind range from mere cross-references and running titles, to more detailed intratextual divisions or content summaries. In fact, they make explicit the way exegetes of the *De institutione musica* articulated, analyzed and focused on certain aspects of the text. Hence some of their intellectual preoccupations, the particularities of their reading habits and their method of textual analysis become apparent. Comparing the latter two aspects with what is known about the method of commenting on texts at the university (using for instance *lectio*,

divisio textus, *expositio*, *dubitatio* and *questio*)[27] may illuminate the intellectual and institutional context for these glosses.

At first, a great disparity in the use of exegetical glossing is noticeable. There are hardly any glosses of this type in P whereas the margins of B_1, B_2 and, to a lesser extent C, are crammed with dozens of *notae* pointing to important passages of the text (ranging from drawn pointing fingers, stylized capital N, musical notes in square notation, short glosses introduced by *nota quod*…), but also, most notably, with content summaries for certain chapters of the treatise. OM elucidates the text by using the Euclidian axiomatic method. Because of its uniqueness, it will be described separately below. Before that, let us turn to the content summaries as found in B_1, B_2 and C.

The content summaries of C are usually located in the margin near the heading of the chapter and they are far too succinct to be of interest.[28] If the glossator of C is always extremely laconic, that of B_1 offers more elaborated abridgements often used to supplement and explain the arithmetical demonstrations of the treatise. For instance the glossator of B_1 summarises the passage in *De institutione musica* II, 28 about the ratio of the minor semitone as follows:

> Inquirit Boethius in hoc loco in quibus primis numeris inveniatur minus semitonium. Quod facit sic: dicit quod cum omnis diatessaron constat ex duobus tonis et semitonium minus. Debet equari duos tonos in continua dispositione numerorum ut cognitis numeris qui habeant facere proportionem tonorum continuorum. Investigat deinde qui [numeri] faciunt semitonium minus. Hic autem non potest fieri nisi in diatessaron inpleta, procedit ergo sic secundum regulam preassignatam que talis est: '*omnis multiplex*, etc.[29]

The short summaries scribbled in the margins of B_2 are more revealing than the ones in B_1 because the former sometimes shows signs of one of the scholastic procedures of

[27] The literature about the scholastic method in the thirteenth century is extensive. The most recent and comprehensive treatment of the question for the Arts faculty of Paris is certainly O. Weijers, *Le maniement du savoir. Pratiques intellectuelles à l'époque des premières universités (13^{e}-14^{e} siècles)* (Turnhout, 1996) and more particularly Chapter 3: 'Les cours: méthodes et pratiques'.

[28] To give but one example, near the headings of Book I, 18-20, we read successively in the margins: 'hic determinat qualiter diatessaron distat a diapente'; 'hic ostendit ex quibus constat diapason'; 'hic determinat de vii cordis cithara', (C, fols. 9r-v).

[29] B_1, fol. 62v.

textual analysis: the *divisio textus*.[30] With the help of these intratextual divisions, the glossator orients the reader in the meanderings of Boethius' arguments and demonstrations without necessarily taking into account the existing division of the text into chapters. He frequently regroups several chapters dealing more or less with the same material under a single general content summary. Chapters 16-19 of Book I dealing with the ontological status of consonance are articulated as follows:

> Hic incipit illa pars ubi est de demonstratione consonantie secundum suam quantitatem, […] Et haec pars dividitur in duo. In prima determinat antecedentem ad propositum usque ad *his expeditis* [*De institutione musica*, 212]. Predictum dividitur in duo: in prima determinat de consonantiis secundum quod sunt in numerali proportione quasi commentando quod prius dixit, in secunda parte determinat de consonantia in se.[31]

Then, the glossator adds to each chapter a specific marginal summary. Chapter 16 – the famous chapter on the impossibility of dividing a whole tone into two equal parts – is summarized in the following way:

> Hic adhuc in hoc primo antecedente determinat de consonantiis in se et non secundum quod sunt in proportione numerali. Et haec pars dividitur in duo: in prima, quia posset aliter videri quod tonus posset dividi in duo equalia per expositionem huius nominis "semitonus", probat quod non, in secunda de quo intendit.[32]

Now, one may legitimately wonder what the exact function of these marginal summaries and textual divisions could have been. This question is even more pressing in view of the impressive number of such glosses interspersed in the five books of the *De institutione musica* in B_2. The plethora of these short marginal accounts running throughout the treatise conveys enough information to allow one to easily grasp the sometimes very difficult content of the *De institutione musica*. Using such summaries, often exempt from technical vocabulary or computation, a student could have been spared the laborious task of reading Boethius' disquietingly intricate digressions. The clear function of the B_2 glossator's brief

[30] On the *divisio textus* see Weijers, *La disputatio à la faculté des Arts. Esquisse d'une typologie* (Paris, 1995), 13-5.
[31] B_2, fol. 11r. It is noteworthy that this particular grouping of Chapters 16-19 is also found in the anonymous *Abbreviatio in musicam Boecii* (114-5).
[32] B_2, fol. 12r.

marginal exposés is then to aid the reader not only to find his way through the intricacies of the *De institutione musica*, but also to browse more rapidly through the text. Yet, the glossator of B_2 seems less concerned with the content of Boethius' argument than in its logical articulation. Both the textual divisions and expressions like *antecedens*, *antecedens ad propositum*, *consequens, prius,* etc. found in the example quoted above, and in many other glosses, corroborate this view. Outlining and articulating the logical progression of Boethius' argument has a visible consequence: it facilitates the memorization of the essential points of the treatise. Finally, the segmentation of the text into useful and judicious units also hints at the degree of understanding and the intensity with which the glossator of B_2 worked on the *De institutione musica*. Although he displays a good overall knowledge of Boethius' treatise, his lack of rigour, and sometimes depth, clearly indicate that the study of this textbook was not one of his primary concerns.

One can conjecture from these elements that B_2's marginal summaries mirror the needs of a readership only loosely inclined to speculative music theory, but that was nevertheless interested in a cursory knowledge of the *De institutione musica*. From the elements gathered in Chapter 1, this characterisation perfectly fits a university readership.

One remark further strengthens the link between B_2 and the university milieu. At the beginning of the treatise, the anonymous glossator gives a succinct but detailed content summary of Boethius' philosophical proem, one worth quoting at length:

> Supponatur ad primum quod iste liber ut vult quidam sit de numero sonoro. Dividitur iste[33] liber in duo: in proemium et tractatum. In quolibet proemio quattuor habent determinari, scilicet de quo est liber et propter quid et quis modus agendi in hoc libro, et qualis causa est efficiens. In isto proemio .2. docuntur: de quo libri est intentio docet titulus, sed non de quo ut de subiecto libelli et hoc quia per singulos libros docet quid est subiectum libri.[34]

Besides the expression *numerus sonorus* which was often used in the Arts faculty of Paris as an equivalent for the newly construed object of music, the *numerus relatus ad*

[33] iste] ille *add*.
[34] B_2, fol. 4r.

sonos,[35] other features are of interest. The distinction established by the glossator between 'proemium' (i.e. the first two chapters) and 'tractatus' has also found its way into the margins of C, which we know with certitude has connections with the university milieu.[36] Equally pertinent are the four criteria referred to by the glossator as the necessary points to be tackled in a proem. In fact, they recall the Aristotelian *accessus*-schema which, as we have already seen, was favoured by the masters of the University of Paris from 1220 onwards.[37] With slight variations B_2's four criteria coincide with the four causes: to the 'about what' (*de quo*) criterion could correspond the material cause, to the 'because of what?' (*propter quid*) the final cause, to the 'which way of ordering?' (*quis modus agendi*), the formal cause and finally to the 'what kind of efficient cause?' (*qualis causa est efficiens*), the efficient cause. It is noteworthy that the Aristotelian accessus-schema and the particular expression *modus agendi* used in relation to the 'formal cause' are also documented in the Parisian *Abbreviatio in musicam Boecii* edited by Christian Meyer and in the section of music of the Parisian basic handbook *Accessus Philosophorum* (*c*.1230).[38]

However, two aspects exclude the eventuality that B_2's glosses are evidence of classroom activity at the Arts faculty of Paris. Firstly, all five Books of the *De institutione musica* are clogged up with the kind of exegetical glossing described above, while, as we have seen in Chapter 1, only the first two Books were *de forma* in Paris. Secondly, it is true that summaries and textual divisions of B_2 akin to the numerous exegetical glosses were profusely disseminated in the margins of thirteenth-century copies of the Aristotelian corpus

[35] See for instance the *Accessus Philosophorum* (*c*.1230): 'musica est de sono in numeris uel de numero sonoro' (203); or the *Compendium circa quadrivium* (*c*.1240): 'numerus relatus ad sonos sive numerus sonorus, quod idem est' (ed. C. Lafleur in *Quatre introductions à la philosophie au XIIIe siècle* [Paris, 1988], 405).

[36] 'Finita parte prohemiali aggreditur tractatum. Et est prima pars eius de elementis musice et ducitur usque ad secundum librum, et sumitur elementum communiter ad principium. Agit enim de principiis [*ms*. principis] musice formalibus ut sunt que cadunt in diffinitionem consonantiarum […] Agit etiam de principiis [*ms*. principis] musice formalibus prout dicitur forma composita partium etc. Agit etiam de principiis [*ms*. principis] materialibus ut sunt instrumenta etc.' (C, fol. 4r).

[37] See above Chapter 1, 55-56.

[38] 'Causa formalis duplex: forma tractandi et forma tractatus. Forma tractandi idem [est] quod modus agendi […].' (*Abbreviatio in Musica*, 109); 'Causa formalis est modus agendi sive qualitas operi que consistit in intentionibus librorum et capitulorum principalium.' (*Accessus philosophorum*, 203-4).

connected to the Arts faculty milieu.[39] Yet in the glosses on Aristotle from *c.*1230-1260, the text is systematically subdivided into equal reading units or *lectiones*, roughly corresponding to an actual lesson in the classroom. Furthermore, in these glosses textual divisions and content summaries giving the general meaning of a passage (*sententia in generali*) almost always precede a more detailed exposition of the text. Both such a detailed exposition and such a systematic cutting of the text are absent in B_2. Thus, although the glosses of B_2 exhibit indubitable scholastic features and hence connexions with the university milieu, they appear as unsystematic reading notes.

In sum, the survey of the exegetical glosses transmitted in our corpus has singled out one glossator, that of B_2, as the champion of this kind of glossing and more particularly of marginal content summaries. From the nature and scope of these numerous comments, the glossator appears as well acquainted with scholastic method and more particularly with the kind of textual analysis practised in the Parisian (and Oxonian) Arts faculty classrooms around the middle of the thirteenth century. Yet the unsystematic character of these glosses indicates that they were copied as a result of a personal reading of the treatise, perhaps by Petrus de Cosyngton himself, master of Arts and owner of the manuscript. Nonetheless when placed in the broader tradition of the *De institutione musica*, the position of B_2 can be more fully and more accurately appreciated. This glossed manuscript constitutes an intriguing precedent to other more consciously formalised attempts to summarize Boethius' *De institutione musica* within the institutional setting of the university such as the Parisian *Abbreviatio in musicam Boecii.* However, B_2's glosses appear as personal reading notes

[39] Compare for instance the following glosses from B_2 and from an anonymous marginal gloss on the *Physics* copied in Paris around the middle of the thirteenth century. 1) Gloss from B_2: 'hic intendit specialiter docere quomodo fiunt consonantie in monocordo in quolibet genere et assignat numeros unicuique quod prius non fecit…Et hoc explanandum breviter quicquid dicant alii usque ibi *Si igitur duo*[…] Hic explanat quomodo fiunt numeri proportiones inter numerum minimum et maximum […] dixit hoc usque '*quoniam igitur tetracordum*' (fols. 53v-54r; quotations from *De institutione musica* IV, 6, pp. 319-320 are italicized). 2) Anonymous marginal gloss on Aristotle's *Physica* II, 2: 'In parte prima sic procedit: dicit quod cum determinat scientiam naturalem potest dici duobus modis scilicet de materia et forma […] Hic considerat in quo differt mathematicus a naturali […] Consequenter cum dicitur '*hiis quidem igitur*' dat ipsam differentiam inter phisicum et mathematicum geometram et est quod quamvis de utriusque consideratione sint soliditates, superficies…' (F-Pn lat. 6320, fol. 4v).

inconsistently scribbled in the margins of this manuscript. Nevertheless, once joined together, the exegetical glosses of this manuscript transmit yet another amalgamation of doctrinal points and definitions that the masters and students of Arts would no doubt have found very useful.

Mathematical glosses

Arithmetic

In a recent article, Michael Bernhard judiciously remarked that most of the glossing of the *De institutione musica* from the *Glossa maior* 'was not done from the standpoint of applied music theory, but from the standpoint of mathematics'.[40] In fact, one should rather say 'from the standpoint of arithmetic'. Indeed, the *Glossa maior* abundantly distils arithmetical paraphrases and demonstrations. Such a tendency is probably accentuated on the one hand by the fact that music and arithmetic shared a common interest in numbers, and on the other hand, by the cogent links that existed between Boethius' *De institutione musica* and his first mathematical *opus*, the *De institutione arithmetica*. Therefore, it was normal for medieval commentators to see both treatises as complementary textbooks – a view still held at the University as the interrelated *Abbreviatio in arithmeticam Boecii* and *Abbreviatio in musicam Boecii* studied in Chapter 1 indicate.[41]

The relationship between arithmetic and music is close and intellectually demanding. Number and sound are independent and yet conceptually and aesthetically bound companions. In approaching Boethius' pervasive arithmetical digressions, so central to the kind of Pythagorean music theory he expounded, ideally one had to possess a solid background in speculative arithmetic and a capability – uncommon in an age of poor

[40] Bernhard, 'Glosses', 148.
[41] See above Chapter 1, 58-60.

numeracy – to handle deftly intricate computations with Roman numerals. An undisputed aptitude and unwavering diligence in the study of arithmetic was the route to sufficient and yet informed comprehension of the most fundamental principles of the numerically founded Pythagorean acoustic system that constituted the core of the *De institutione musica*.

Some of the most widely discussed passages of the *De institutione musica* by its medieval readers were certainly those, arithmetically charged, dealing with the semitone and with similar problems such as the determination of the ratio of subtonal intervals like the *apotome* (major semitone) or the coma, or else with the refutation of Aristoxenus' statement that the octave is composed of six tones.[42] In fact, the *De institutione musica* was thought to be the inevitable reference on these matters. The *De institutione musica* thus provided a rational and arithmetical approach to interval theory. The latter was not only at the heart of the Pythagorean acoustic system but also of Platonic cosmology; after all, the world-soul had been 'mixed' by the Demiurge according to musical ratios. Indeed, in medieval glosses and commentaries on Plato's *Timaeus* or on Macrobius' *Commentarium in somnio Scipionis*, cosmological and philosophical remarks linked to musical intervals were often articulated with the help of the *De institutione musica*. For instance, a twelfth-century commentator on Plato's *Timaeus* named Hisdosus encourages his reader to study Boethius' *De institutione musica* in order to better comprehend Plato's description of the world-soul.[43]

In the *Glossa maior*, however, the tendency was less to relate the interval theory expounded in the *De institutione musica* to the cosmological doctrines of medieval Platonism than to elaborate highly self-conscious and often brilliantly didactical, arithmetical digressions.[44] For its early commentators, Boethius' treatise was a starting point to practice arithmetical tools and method. In teaching arithmetic with the help of the *De*

[42] See notably Boethius, *De institutione musica* I, 17; II, 28-31; and most of Book III.
[43] 'Qui haec omnia ad plenum nosse desiderat, Musicam Boecii studiosissime legat, quia ita succincte auditoribus in quadruvio rudibus expedimus ne penitus nescita obscuritati Timei crassis tenebris obvolute maiorem caliginem ingerant.' (Hisdosus, *Commentum super constitutionem animae mundi*, F-Pn lat. 8624, fol. 21r).
[44] See *GM*, I, 239-245; II, 216, 249, 255-7, 268-9, 275-277, 284-5; and III, 28-9, 31-4, 38-9, 54, 62-3, 68, 72, 92-3, 137, 174, 183.

institutione arithmetica, medieval scholars envisioned the *De institutione musica* as a repository of readily available concrete exercises of application, notably for computations with ratios.[45] For instance, as Table 1 illustrates, the problem of the non-divisibility of the whole into two equal halves was a typical school problem, and it gave rise to a multiplicity of treatments from simplistic digressions to virtuoso displays of computational mastery.

Arithmetical proficiency	**Glosses and Commentaries on Plato's *Timaeus***	**Glosses and Commentaries on Macrobius**	**Miscellaneous**
Level 1 (skimpy glosses, diagrams, cross-references, undemonstrated assertions)	Bernard of Chartres, *Glosae super Timaeum*, ed. P. Dutton, (Toronto, 1989), 179-180.	Köln, Domsbibliothek 199, fol. 37ra; F-Pn lat. 6372, fol. 35v; F-Pn lat. 18421, fol. 52r; I-Fn, Rossi Cassigoli 360, fol. 64r; GB-Lbl Harley 2633, fol. 24r; GB-Ob Selden Supra 26, fols. 76v and 96v; GB-Ctc R. 9. 23, fol. 49v.	*Notae supra semitonium*, ed. A. Peden in 'De semitonio: Some Mediaeval Exercices in Arithmetic', *Studi medievali*, ser.3, 35 (1994), 401-2; *Glossae in Arithmetica Boecii*, GB-Otc 17, fol. 40r.
Level 2 (didactic demonstrations presupposing arithmetical knowledge)	GB-Occ 243, fols. 156rb-157ra; I-Rvat Pal. lat. 953, fols. 120va-b; E-SAu 2322, fols. 173va-174ra; F-Pn lat. 8624, fols. 20v-21r. William of Conches, *Glosae super Platonem*, ed. E. Jeauneau (Paris, 1967), 163-167.	F-Pn n.a.l. 923, fol. 32r; I-Rvat Pal. lat. 953, fols. 119rb-va; William of Conches, D-Kk, Gl Kgl S 1910 4°, fols. 106r-106v.	Ralph of Laon, *De semitonio*, ed. Peden, in '*De semitonio*', 398-401; *Regula semitonii inveniendi*, in *GM*, III, 398-9.
Level 3 (virtuoso demonstrations and notably computations with duodecimal fractions)	I-Fn Conv. Soppr. I II 50, fols. 64r-v; F-Pn lat. 16759, fols. 53v-54v; F-Pn lat. 14716, fols. 273va-b.	F-AVR 226, fol. 81v; D-Mbs Clm 14708, fols. 32rb-vb.	*De ratione et divisione semitonii*, ed. Peden, in '*De semitonio*', 391-397.

Table 1: The Problem of the Semitone in Select Sources (12th-14th cent.)

As we have seen, at the Arts faculty of Paris, the attitude towards the *De institutione musica* changes in the thirteenth and fourteenth centuries. The masters turn away from an arithmetical interpretation that had up to then dominated the history of the reception of the treatise. All arithmetical demonstrations of the first two books are either carefully put aside (as in the basic handbooks or the Harley compilation) or reduced to a minimum (as in the

[45] The use of concrete problems to practice arithmetical computations and reasoning is documented from the Carolingian times notably with Ps-Bede's *De arithmeticis propositionibus* or Alcuin's famous *Propositiones ad acuendos iuvenes*. See M. Folkerts, 'Die Alkuin zugeschriebenen Propositiones ad acuendos iuvenes (Aufgaben der Schärfung des Geistes der Jugend)', in *Science in Western and Eastern Civilization in Carolingian Times*, eds. P. L. Butzer and D. Lohrmann (Basel, 1993), 283-362.

Abbreviatio in musicam Boecii). The focus now shifts to definitions and more particularly those definitions linked to consonance and matters of classification. Among the glossators of the treatise for the period, those of C and B_2 embark on a similar hermeneutical avenue as that of the Parisian masters of Arts. In B_2, the substance of Boethius' arithmetical demonstrations is often summarized and purged of its calculations.[46] The glossator of C is even more radical, to the extent that not a single one of his glosses contains computations or even numbers.

In fact, only the B_1 and P glossators display some interest in arithmetical computation. By and large, their interpretative strategy is twofold. On the one hand they limit themselves to a clearly articulated paraphrase of the *littera* of the treatise; the main objective is to re-work, re-arrange and rephrase in a much simpler way the passages commented upon.[47] On the other hand, both glossators sometimes adopt another strategy similar to that of the *Glossa maior*. They take Boethius' demonstration as a point of departure to elaborate their own original arithmetical exercises. In this case, they not only employ a very detailed and yet highly pedagogical mode of exposition but they also show an impressive mastery of computations with large numerical values, duodecimal fractions and explanatory diagrams. A good example of this is found in P when the glossator starts from Boethius' affirmation (*De institutione musica* II, 18) that consonances founded on multiple ratios (octave, octave and fifth and double octave) are prior to those founded on superparticular ratios (fifth and fourth) because the latter can be derived from them. In a

[46] See for instance B_2's description of Boethius' demonstration that 256:243 is not the perfect half of a tone (*De institutione musica* II, 27): 'hic vult demonstrare quod non est semitonium integra medietas quia […] semitonus relinquitur ex substractione duorum tonorum a diatessaron sed hoc non est medietas toni, ergo nec semitonus […] Illud quod relinquitur [*ms.* reliquitur] ex substractione non est medietas toni quia talia duo, ut probat, non constituunt tonum, ergo non est dimidium.' (B_2, fol. 33v).

[47] For instance B_1 on the problem of the non-divisibility of the whole tone in *De institutione musica* I, 17: 'Hic probat Boethius quod tonus non dividitur in equa media. Demonstratio: xviii ad xvi collocati, sesquioctavam habent proportionem quia continent xvi in se et insuper eorum octavam partem ii […]. Quod ita probatur centesimus nonagesimus et duo et numerus comparatus ad cclvi sesquitertiam obtinent proportionem quia cclvi continent cxcii in se et eorum tertiam partem id est lxiiii […]. Nota quod in omni sesquitertia proportione sunt due sesquioctave et una proportio que lima dicitur sed quamvis hoc sit non tamen hoc potest inveniri [*ms.* eveneri] in quibuslibet numeris […]' (B_1, fol. 50v). See also P, fol. 34v.

very didactical way, he first posits a general rule and then creates a new arithmetical exercise using duodecimal fractions, so that the student can become familiar with them.[48]

The attitude of the P and B_1 glossators to the treatise is revealing. Without entering into more detail, it is obvious that they manifest a real competence in speculative arithmetic akin to that apparent in the various traditions of the *Glossa maior*. In a way, they exhibit much more conservative approaches to the text than the other thirteenth- and fourteenth-century glossed copies of the treatise which shun arithmetical glossing or at best confine it to passing remarks. The particular attitude to the text in B_1 and P signals an unbroken continuity with the *Glossa maior*. The presence of an earlier layer of glosses in B_1 which directly copies the French tradition of the *Glossa maior*, as well as the quotations in P from the same text, corroborates this view.[49] Thus, much as in the *Glossa maior*, the intent of our glossators is not only to explain the *littera* of the text and therefore to understand fully the kind of Pythagorean speculative thinking about music involved in the *De institutione musica*, but also to elaborate original arithmetical exercises directly from the text.

Now, the arithmetical acrobatics frequently practised in B_1 and P suggest that their readership must have been conversant with the science of numbers. Such a characterization does not really suit a typical university audience. Therefore, though these two manuscripts were at an early stage part of university-related libraries, Balliol College for B_1 and the *Collège de Navarre* for P, it is highly likely that they were copied in a different intellectual

[48] 'In superparticularibus quanto maior est numerus tanto minor proportio, in multiplicibus e contrario […]. Diapente ac diapason recte opposita sunt et similiter in ceteris que secundo loco augent aut minuunt proportiones […]: dividamus primum assem in duos semisses ad utrumlibet eorum duplam optinet proportionem, auferantur due partes alteri earum medietatum et residua iungatur alterius medietati et procreabitur sesquialtera habitudo. Idem assis in iii divisus partes, duabus ablatis ad eam que residua est triplicem habet proportionem. Divisus enim in tres trientes, [fol. 29v] duabus ablatis triplus est ad reliquum rursus tres uncie auferantur de tercio triente que superfuerit reddita duobus, sesquiterciam generat habitudinem. Remanent enim ix uncie ad quem xii sesquitercius est.' (P, fols. 29r-v). For similar digressions see also fols. 39v, 46v and 82r. Other examples are provided by the discouragingly lengthy but didactically charged developments in B_1, fols. 62v-63r, 64v-65r, 65v, and above all, fols. 68v-70bisv. It is noteworthy that for the sake of clarity, a *Tabula minutiarum* giving the most elementary duodecimal fractions and their symbols was appended in B_1at the end of the *De institutione musica*. This *Tabulae minutiarum* is edited as Appendix in *GM*, III, 402.

[49] For B_1 see above. The glosses in P identical to the *Glossa maior* are the following: fol. 19r (*GM*, I, 27, no. 352); fol. 24r (*GM*, I, 53 no. 10); fol. 31v (*GM*, I, 199, no. 79); fol. 39r (*GM*, II, 52, no. 37c); fol. 42r (*GM*, II, 92, no. 23).

milieu. It is also possible that they both transmit glosses composed before the thirteenth century. As we have already seen, the neat script and perfect alignment of the glosses in P suggests that both the glosses and the main text were copied at the same time, possibly even from an older exemplar. In a way, the glosses in B_1 and P perpetuate what had always been the major strand of interpretation of the *De institutione musica,* that is consideration of the treatise essentially from the 'standpoint of arithmetic'.

Before turning to the geometrical and astronomical glosses a final remark needs to be made about the use of Arabic numerals in thirteenth- and fourteenth-century glosses on the *De institutione musica*. The thirteenth century is often described as a key transitional period in the remarkably pervasive diffusion and transmission of Arabic numerals. It is poised between the rediscovery of the art of reckoning with such numbers (known as algorism) in the twelfth century and their overwhelming dominance in Latin and even vernacular mathematical discourse from the fourteenth century onwards.[50] Is this transitional stage also characteristically discernible in thirteenth-century glosses on the *De institutione musica*?

At first, the answer to this question is deceptive. The most arithmetic-oriented glossators of our corpus, that is B_1 and P, always prefer Roman numerals. Perhaps they considered the newly introduced Arabic numbers as fundamentally inapplicable to speculative arithmetic. Indeed, during the first half of the thirteenth century, Latin scribes and scholars tended to associate the old-fashioned Roman numerals almost exclusively with speculative arithmetic. Arabic numerals, in contrast, were always reserved for the newly introduced art of reckoning known as 'algorism'.[51] Perhaps even, because such a notational

[50] For the early diffusion of Arabic numerals in the Latin West see A. Allard, *Al-Khwarizmi. Les versions latines de l'arithmétique* (Louvain, 1989). On the impact of algorism at the University of Paris, see G. Beaujouan, 'L'enseignement de l'arithmétique élémentaire à l'Université de Paris aux XIII^{e} et XIV^{e} siècles', in *Homenaje a Millàs-Vallicrosa* (Barcelona, 1954), I, 93-124.

[51] A good example of this is found in a mathematical compilation from the first half of the thirteenth century preserved in CH-Bu F II 33 which contains certain works by Jordanus Nemorarius. The single scribe of this manuscript uses Arabic numerals in Jordanus' *Algorismus* (fols. 99r-105r) whereas he prefers Roman numerals for Jordanus' *De elementis arithmetice artis* (fols.65r-83r), an axiomatised work on speculative arithmetic.

change implied conceptually a real paradigmatic shift, the two glossators found the use of Arabic numerals more intellectually demanding than that of the Roman numerals. Hence, this would indicate that they both matured in a milieu or at a time where Arabic numerals had not yet made a decisive entry.

In another thirteenth-century set of glosses, however, the 'transitional stage' from Roman to Arabic numerals is clearly visible. Although the B_2 glossator displays only a minimal interest for arithmetic, he can be singled out for his use of Arabic numerals. In summarizing the content of the *De institutione musica*, he attempts at times, even if inconsistently, to translate the text's Roman numerals into Arabic numerals. In fact, he translates only simple figures.[52] When the values get more complicated, as for instance in the intricate computations of the ratios for subtonal intervals, he returns to a paraphrase of the text.[53] That he felt uneasy in translating large Roman numerals hints at a lack of proficiency in the art of reckoning with Arabic numerals because it was undoubtedly a time of transition between the two systems. Besides, B_2 represents one of the earliest known instances in which speculative concerns about music theory are approached with the aid of Arabic numerals. Indeed, it is only in the late fourteenth-century copies of Johannes de Muris' *Musica speculativa* that canonical problems of *musica* were to be treated with the use of Arabic numerals.[54] Hence, this new evidence illustrates that despite a slow progress in the realm of music theory, Arabic numerals had already found their way into highly speculative discussions about music in the first half of the thirteenth century.[55]

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[52] For instance on *De institutione musica* II, 14: 'XXXVI id est 6 per se ipsum, XXIIII id est 4 per 6, XVIII id est 6 per 3, XVI id est 4 per se ipsum, XII id est 3 per 4, IX id est 3 per se ipsum' (B_2, fol. 28r). At *De institutione musica*, II, 28, Boethius demonstrates that the fifth, fourth and the tone are all in superparticular proportion. The glossator writes down the following series of Arabic numbers:
'9. 8. 6.
64. 72. 81.
8. 9. 9.
8. 8. 9.' (fol. 24r). See also the Arabic numerals on fols. 22v, 31r-v, 32r, 39r, 46r and 50r-v.

[53] See for instance B_2, fols. 34r and 51r.

[54] The oldest manuscripts of the treatise (F-Pn lat. 7378A, fols. 41v-45v, D-EF 2° 295, fols. 207r-214r and E-Sc 5-3-23, fols. 91r-101v) contain diagrams exclusively with Arabic numerals.

[55] This remark goes against Christopher Page's hypothesis according to which before the beginning of the fourteenth century Roman numerals 'looked like a proper equation for a discussion of theory' whereas Arabic

To recapitulate, the glossators B_1 and P appear, in their attitudes to the text, as perpetuators of the *Glossa maior*. They perpetuate in the thirteenth century what could be seen as the traditional strand of interpretation of Boethius' *De institutione musica*: an interpretation from 'the standpoint of arithmetic'. Furthermore, like their predecessors, they sometimes tend to consider the treatise as a repository for applied mathematical problems. Their intent is not only to explain the *littera* of the text, and therefore fully understand Pythagorean speculative thinking about music, but also to elaborate from the text independent arithmetical exercises that could be used in the classroom to practice computations with ratios. Furthermore, the absence of Arabic numerals like the ones found in B_2 indicates that the glosses in B_1 and P were produced in a milieu or at time when reckoning with Arabic numerals was still considered exotic. This suggests a non-university provenance and/or an earlier date of composition for the glosses copied in B_1 and P. By adopting a rather conservative hermeneutical strand these two glossators distance themselves from the other thirteenth-and fourteenth-century sets of glosses on the *De institutione musica*. It is clear that in the latter, arithmetical problems are no longer considered to be the central if not the exclusive concern of Boethius' treatise. This lack of interest provides a paradoxically telling *ex silentio* argument in favour of the emergence of a new interpretative strand which brings these sets of glosses closer to the university milieu. What does this shift in the reading habits of the *De institutione musica* consist of more precisely? Once arithmetic is put aside, which disciplines and textbooks did the glossator use to tie the new interdisciplinary bonds? How did they ingeniously create imaginative models of interpretation in response to these new preoccupations? Can these models be considered typical products of an Arts faculty teaching? Such large questions are hard to answer. They will constitute the weave for the fabric of the remaining part of the present chapter.

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numerals 'suited a practical account of measured notation'. See C. Page, *Discarding Images. Reflections on Music and Culture in Medieval France* (Oxford, 1993), 135.

Geometry

As a compendium of Pythagorean acoustics, the *De institutione musica* left very little space for geometrical digressions. Dealing with 'immobile magnitudes' geometry was indeed ontologically opposed to arithmetic and music concerned with multitudes.[56] Accordingly, the whole *Glossa maior* contains in a family of three French manuscripts only a single reference to the geometrical textbook *par excellence*: Euclid's *Elements*.[57] Any attempt to relate the *De institutione musica* to geometry, and more precisely to Euclid, can be seen as a departure from the traditional interpretation of the treatise and therefore as a change in reading habits. Such a departure is clearly visible in OM to the extent that the glossator literally proposes, with much ingenuity and complexity, a Euclidian reading of the treatise. Not only does he quote directly from Euclid's *Elements* no less than twenty-eight times but also, and perhaps more importantly, he makes extensive and elaborate use of Euclidian terminology and method. At a first glance, the numerous references to Euclid seem to be drawn from the most widespread Arabic Latin version of the *Elements* known as Adelard II.[58] We shall first concentrate on the way the glossator interestingly has used Euclid's axiomatised method and terminology as a means to articulate Boethius' text. Then, we shall scrutinize how he has attempted to relate the content of the *De institutione musica* to the *Elements*.

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[56] See Boethius, *De institutione arithmetica* I, 1, p. 11.

[57] Commenting on Boethius' explanation of the operating principles of the monochord, the glossator behind these three manuscripts refers to two Euclidian postulates related to perpendicularity: 'sicut dicit Euclides *in tercio* […] idem *in quarto*' (*GM*, III, 298). '*In tercio*' and '*in quarto* ' refer to Books III and IV of an eighth-century Euclidian compilation known today as *Geometry I*. See M. Folkerts, *Boethius Geometrie II. Ein mathematisches Lehrbuch des Mittelalters* (1970, Wiesbaden), 69-82. Folkerts had edited abstracts from Books III and IV of the *Geometry I* as an appendix; the postulates quoted in the *Glossa maior* are found respectively at pp. 176 and 212. The particular wording of the Euclidian passages from the *Glossa maior* suggests a connection with the tenth-century Northern French manuscript of *Geometry I*, GB-Ctc R.15.14.

[58] For a recent and detailed account of the medieval reception of Euclid, see M. Folkerts, *Euclid in Medieval Europe* (Winnipeg, 1989). The numbering and, in certain cases, the wording of the postulates given in OM fully concord with that of the Adelard II Version as edited by H. L. L. Busard and M. Folkerts, *Robert of Chester's (?) Redaction of Euclid's Elements, the so-called Adelard II Version* (Basel-Boston-Berlin, 1992).

OM's glosses are replete with Euclidian terms. In order to analyse and segment the text into discrete units, the glossator wittingly calls on such notions, central to geometrical demonstrations, as *correlarium*, *suppositio*, *propositio*, *ratiocinatio*.[59] Besides this basic use of Euclidian terminology, he seems to be the first scholar to apply the Euclidian axiomatic method to Boethius' *De institutione musica*. He makes a first step towards the axiomatisation of the *De institutione musica* by implicitly affirming that the whole treatise can be reduced to seventeen essential *theoremata*. If the first theorem is not clearly described, the second theorem reads as follows: 'secundum theorema huius libri est hoc: omnis consonantia est multiplex uel superparticularis proportio.'[60] Then, one has to jump to the end of Book II, to find specific theorems associated to Chapters 22 to 31 of this book:

> Diapason est in multiplici genere et hoc est tercium theorema huius scientie. Quartum est diatessaron et diapente esse [in] superparticulari proportione. Quintum: diatessaron et diapente sunt in duabus minimis superparticularibus. Sextum: diapente in sesqualtera et diatessaron in sesquitertia proportione et tonus in sesquioctava consistit. Septimum: diapason cum diapente in tripla [proportione consistit]. Octavum: bis diapason in quadrupla proportione consistit. Nonum: ex diapason et diatessaron nulla coniungit proportio. Decimum: semitonium est proportio ducentorum quinquaginta sex ad duecentos quadraginta tres. Undecimum: semitonium predictum est minus quam integra toni medietas[…]Duodecimum: apotome est proportio 2187 ad 2048. Tredecimum: diapason consonantia minor est sex tonis, voco autem coma quod diapason est minor sex tonis.[61]

Finally, three other theorems are laid down in the margins of Book III, 14 (about the coma and the composition of subtonal intervals): '15. Semitonium maius est minus quam quattuor comata, maior quam tria. 16. Apotome est maius quam quattuor comata, minus quam quinta. 17. Tonus est maior octo comatibus, minor [quam] 9.'[62]

As the content of these theorems illustrates, it is clear that the scope of Boethius' *De institutione musica* is reduced to the determination of the numerical ratios founding not only musical consonances but also subtonal intervals. In fact, in reducing Boethius' lengthy

[59] See for instance O, fols. 12v, 13r 16r, 16v, 17r, 17v, 19r, 21r, 23r, 28r, etc.; M, fols. 17v, 18r, 21v, 31r, 36r, etc.
[60] O, fol. 3v; M, fol. 4r.
[61] O, fol. 16r; M, fol. 21v.
[62] O, fol. 25v; M, fol. 35v. Note that the fourteenth theorem is not clearly enunciated by the glossator.

demonstrations to a few universal theorems and postulates, the glosses in OM appear as a hitherto forgotten precursor of Johannes de Muris' famous and influential *Musica speculativa*, the most successful axiomatised abbreviation of the *De institutione musica*.

It has often been assumed that Muris was the first scholar to elaborate an axiomatic treatment of *musica*.[63] By using Euclidian terms like *conclusio, ratiocinatio*, *corrolarium*, *suppositio, propositio* and by articulating and dividing the core of Boethius' treatise (i.e. the interval theory) into theorems, it would seem, on the contrary, that the OM glossator opened the path to Johannes de Muris. A closer comparison between on the one hand OM's seventeen sketchy and embryonic theorems and on the other hand Muris' fifteen fully developed and complex *theoremata* or *suppositiones* in Book I of his *Musica Speculativa*, reveals no evidence of a direct historical connection between the two authors. One can even note some contradictions between them. For instance, OM's last three theorems about the determination of the number of comas contained in the minor semitone, the major semitone and the whole tone are referred to by Johannes de Muris as *correlaria* for, according to him, 'quasi manifesta sunt ex praeassumptis, ne de his nova theoremata formare sit necesse'.[64] However, the glossator's introduction of Euclid's axiomatic method into the realm of *musica* indicates that such a strand of interpretation might have existed well before the work of Muris. Again, the *Musica speculativa* probably did not appear in a vacuum. It may have relied on a geometry-oriented hermeneutical tradition of which almost nothing but OM's extensive marginal comments have survived.

The interest aroused by OM goes beyond the mere structuring of his argument with the help of the Euclidian axiomatic method. His endeavour to relate the content of Boethius' *De institutione musica* to the *Elements* is equally revealing of a very idiosyncratic attempt to link music theory with geometry. To do so, he develops two strategies. The first strategy consists of establishing *loci paralleli* between Boethius' enunciations and demonstrations on

[63] See for instance Hentschel, *Sinnlichkeit*, 253.
[64] Johannes de Muris, *Musica speculativa*, A, 200-204; B, 201-205; A/B, 339.

the one hand, and Euclidian postulates on the other hand. Examples of these kinds of shortcuts abound. One should suffice to illustrate our point. In *De institutione musica* II, 28, Boethius expounds the method for finding the ratio for the minor semitone. Referring to the rule according to which when numbers are multiplied by the same number, their ratio remains the same, the glossator twice mentions a similar postulate found in Book VII of the *Elements*: 'HIS VERO [261, 6] ex 37ª septimi Euclidis argumenti' and then later 'MOX [261, 12] ex 37ª septimi Euclidis'.[65]

In most cases, OM refers to postulates found in Books VII and VIII of the *Elements* that he renames *Euclides in numeris* or *Arismetica Euclidis*.[66] Such a feature is after all not so surprising. Indeed, these two Books are not really concerned with geometry *per se* but with number definition and theory. Medieval readers often perceived Books VII, VIII and IX of the elements as complementary to Boethius' *De institutione arithmetica*. The anonymous author of the Parisian *Abbreviatio in arithmeticam Boecii*, for instance, remarks that these three books of Euclid's *Elements* approached in a 'demonstrative way' (*demonstrative*) what Boethius had only introduced in a more descriptive way.[67] The anonymous author of the *Questiones mathematice* includes abstracts and abridgements from Boethius' *De institutione arithmetica*, as well as definitions taken from Book VII of Euclid's *Elements* in the so-called Adelard II version.[68]

Book VII not only expounds definitions that were echoed in Boethius' own mathematical works, but it also offers a geometricized approach to integers, and above all, to ratios. Book VIII expands on the results of Book VII. As a matter of fact, numerous postulates in Book VII and Book VIII of the *Elements* are devoted to computations with ratios and proportionality. Although the latter are envisioned geometrically, these two books

[65] O, fol. 17v; this gloss lacks in M. See *Adelard II*, 199.
[66] O, fols. 14v and 24r; these two glosses are missing in M.
[67] 'Forma tractandi est modus agendi qui est diffinitivus, divisivus et figurarum et exemplorum positivus. Nam licet arismetica alicubi tractatur demonstrative ut in 7° 8° et 9° Geometrie, tamen in isto libro traditur narrative.' (*Abbreviatio in arithmeticam Boecii*, fol. 133ra).
[68] *Questiones mathematice*, fols. 203ra-va.

remain entrenched in the general framework of Pythagorean mathematics. More particularly, as recent research has shown, they actually formalise the work of Archytas of Tarentum and his circle.[69] The latter was a prominent music theorist of the late Pythagorean School and one of the ancient authorities frequently quoted in the *De institutione musica*.[70] Because Archytas' work was a source common to both Euclid and Boethius it would have been easy to draw judicious correspondences between Books VII and VIII of the *Elements* and certain passages of the *De institutione musica*. There is no doubt that highlighting parallels and common features in the two textbooks for music and geometry helped OM successfully establish an interdisciplinary bond between the two disciplines.

The second strategy used by OM to bring together the *Elements* and the *De institutione musica* aims at filling any eventual lacunae spotted in Boethius' demonstration with the help of Euclidian postulates and method. The integration of Euclidian geometry is more profound here. After embroidering Euclidian elements within the Boethian fabric of the *De institutione musica*, OM now uses the *Elements* as a guide for elaborating more complete demonstrations in place of the deficient or ill-formulated ones of the treatise. In a way, in as much as the *Glossa maior* tradition used the *De institutione musica* as a repository of arithmetical exercises, the OM glossator uses the treatise to practice Euclidian geometrical tools and method.

Central to OM's application of geometry to music theory problems is the de-arithmetization and geometrization of some of Boethius' demonstrations. More than any others, two of OM's numerous geometrical demonstrations exemplarily manifest this compelling strategy.

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[69] See W. R. Knorr, *The Evolution of the Euclidian Elements* (Dordrecht-Boston, 1975), 303-315.

[70] For the role of Archytas as a source for Books III and V of the *De institutione musica* via Ptolemy's *Harmonica*, see C. Bower, 'Boethius and Nicomachus: An Essay concerning the Sources of *De institutione musica*', *Vivarium*, 16 (1978), 5 and 10; see also U. Pizzani, 'Studi sulle fonti del *De institutione musica* di Boezio', *Sacris Erudiri*, 16 (1965), 83-7 and 150-151. On Archytas' musical and mathematical thought and its influence on Ptolemy, see the enlightening article by A. Barker, 'Ptolemy's Pythagoreans, Archytas, and Plato's Conception of Mathematics', *Phronesis*, 39 (1994), 113–35.

In the very difficult last three chapters of Book III, Boethius attempts to determine the number of commas composing the minor semitone, the *apotome* (or major semitone) and the whole tone: the semitone comprises more than three but less than four commas, the *apotome* more than four but less than five and, as a result, the whole tone is composed of more than eight commas but less than nine. The OM glossator judges that Boethius left the demonstrations on that matter unfinished. After having discursively emphasized the defects in Boethius' method and reasoning, the glossator eventually proposes a new and flawless way to approach the problem.[71] His solution is simpler and indeed original:

> Per rationem supradictam in hoc libro que etiam in Euclide demonstratur quod poterimus quotlibet numeros continue proportionabiles secundum proportionem datam invenire. Inveniantur 10 numeri continue proportionabiles secundum proportionem comatis. Sintque hii decem numeri a b c d e f g h i k, sitque a maximus illorum, k minimus. Igitur ab a termino, volo remittere semitonium minus usque ad l. Hoc quoque faciam sumendo partem a cum integro numero si potero, si vero non, sumam in integro et minutiis, ad quam partem sic se habeat a numerus sicut ducenti quadraginta sex ad duecentos quadraginta tres. Si igitur fiunt l minor d et maior quam e, patet quoniam proportio semitonii maior est proportione comatis triplicata, minor vero proportione comatis quadruplicata.[72]

Then, OM applies the same procedure for the *apotome* and the tone and he assertively concludes: 'Per hanc itaque viam verificari potest et compleri demonstratio trium superiorum theoreumatum.'[73]

Although he proposes an alternative demonstration, the OM glossator does not challenge Boethius' *auctoritas* as such. The latter did not include such a demonstration because he wanted to save the reader from reading dauntingly protracted and tedious mathematical digressions.[74] However strong his deference to the authoritative figure of the Roman Patrician, the glossator develops, nonetheless, an original and idiosyncratic approach that falls outside Boethius' conceptual framework. By representing each number by a

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[71] 'Ostendendum igitur existimo ex qua parte demonstrationes Boetii sint incomplete et qua via possent compleri eius demonstrationes' (O, fol. 25v; M, fol. 35v).
[72] Ibid.
[73] Ibid.
[74] 'Credo Boethium hanc viam demonstrationis omisisse non tantum devitans laborem proprium quantum devitavit fastidium legentium.' (Ibid.).

segment roughly drawn in the margins of Boethius' treatise (e.g. a, b, c, d, etc.), he resorts to the Euclidian method of linear visualization for proportional computations. Such a geometrization of the demonstration at hand successfully precludes an arithmetical approach to the problem. It also spares the glossator from the very difficult task of laying down a continuous series of ten numbers in a ratio of a comma. Such a ratio being 531441:524288, one could imagine a certain giddiness induced in the mind of someone who tries to determine, using Roman numerals, whether the ratio for three commas is less than that for a minor semitone.[75] Thus Euclidian method proves extremely economical here.

The geometrization of Boethius' demonstrations is carried one step further when the OM glossator discusses the famous problem on the non-divisibility of the whole tone into two equal halves (here, *De institutione musica* I, 16). Challenging one of the foundational principles of Pythagorean music theory, the anonymous glossator suggests that a whole tone, equal to a superparticular ratio (9:8), can actually be divided into two equal parts. To justify his claims, he uses the example of two strings whose respective lengths are in a ratio of 9:8. When struck simultaneously, they resound a whole tone. Since a continuum can always be equally divided, it is therefore possible, as OM argues, to insert between the two strings a third one so as to obtain a series of incommensurable ratios:

> Dico autem quod possibile est tonum dividi per equalia secundum proportionem non numeralem. Quia si sint due corde equaliter tense quarum una sit alii sesquioctava ille resonabunt tonum inter quas, si ponatur corda medio loco proportionabilis eis equaliter eis tensa, erunt tres soni continue proportionabiles et sic dividatur tonus [*O* sonus] per equalia.[76]

Thus, for the glossator the division of the semitone is not only geometrically possible but also empirically verifiable. The strings are geometrical representations of sounds and the sounding reality offers the ground and the empirical criterion of validity for the actual

[75] For instance, in the sixteenth century, Zarlino spectacularly attempted to demontrate that the whole tone was larger than 9 commas by laying out a number of no less than 21 digits (109,418,989,131,512,359,209). See Gioseffo Zarlino, *Dimonstrationi harmoniche* (Venetiis, 1571), 123.
[76] O, fol. 5v; M, fol. 7v.

division of the whole tone into two perfect halves. In fact, such an experimental demonstration threatens the very rationale at the heart of the Boethian Pythagorean *musica*.

For Boethius music is above all a science strictly concerned with those numerical ratios that ontologically establish consonances (e.g. the first multiple and superparticular ratios) and not with sound conceived as a divisible continuum. Because it was impossible to divide into two equal parts any superparticular ratio by the interpolation of a mean proportional number,[77] the interval of a whole tone based on the superparticular ratio 9:8 cannot then be divided into two equal halves. For the followers of Pythagoras to posit the existence of a perfect semitone was therefore singularly aberrant and preposterous. Such prominent music theorists as Johannes de Muris and Jacobus Leodiensis attest to the fact that this belief was still dominant in the fourteenth century.[78] In fact, the OM glossator's deviances were only made possible at the price of partially giving up the Pythagorean framework. To do so, he first de-arithmeticized and geometricized the problem of the semitone by representing musical sounds as lines and not as numbers. Then he provided an argument *ad experientiam* by proposing, through the use of strings, an empirical validation for the geometrical division of the whole tone. Finally, he introduced the crucial notion of incommensurability by stating that the whole tone was divisible into two equal parts *secundum proportionem non numeralem*. This latter stage would not have been possible without conceptualising the problem geometrically, and grounding and verifying the demonstration empirically. The application of incommensurability to solve the problem of the semitone constitute in fact one of OM's greatest innovations.

As is well known, incommensurability and irrational ratios were completely foreign to the kind of Pythagorean arithmetic expounded by Boethius in the *De institutione musica*

[77] Boethius (*De institutione musica* III, 11, p. 286) directly ascribes this postulate to Archytas. OM links this passage to Euclid (*Elements* VIII, 8; *Adelard II*, 204) who repeats in fact Archytas' postulate: 'quod patet ex octava octavi elementorum'. (O, fol. 5v; M, fol. 7v). This postulate also appears as the third proposition of Ps-Euclid's *Divisio canonis*. See *The Euclidean Division of the Canon: Greek and Latin Sources*, ed. A. Barbera (Lincoln, 1991), 58–60 and 124–7.

[78] On this see F. Hentschel, 'Die Unmöglichkeit der Teilung des Ganztones in zwei gleiche Teile und der Gegenstand der Musica Sonora um 1300', in *MuG*, 33-37.

that accepted only rational and commensurable ratios. Yet, incommensurability lay at the heart of Book X of the *Elements* and constituted one of the most interesting mathematical discoveries from Greek Antiquity transmitted to the medieval West via the Arabic-Latin translations of Euclid.[79] Therefore, in a pioneering manner, the glossator instils this central Euclidian element into his discourse on speculative music theory. Yet, rather than creating a new and thoroughly Euclidian approach to *musica*, he attempts to combine it with the Pythagorean framework which, after all, constituted the basis of the Western acoustic system. Incommensurability (*proportio non numeralis*) between two sounds, OM asserts, is possible, when for instance one sounds two strings whose lengths are respectively equal to the side and the diagonal of a square.[80] The example of the impossibility to expressing the ratio of the diameter and side of a square by two integers was the school example in discussions about incommensurability since the time of Plato and Aristotle. The OM glossator could have borrowed it either from Euclid's *Elements* (X, 117) or from Aristotle's *Prior Analytics* (41a26-7). Yet, although one can actually obtain an interval founded on an irrational ratio, he concedes, the latter falls outside the competence of the musician:

> Cum enim consonantia sit de simili cum sonorum concordans mixtura, non miscentur autem in numerum nisi que sunt commensurabilia quia, si sint incommensurabilia, erit semper aliquid de altero quod superfuit a reliquo et erit reliquum impermixtum, cum inquam ita sit quod omnia commensurabilia se habent ad invicem in proportione numerali ut ostenditur in X° Euclidis, patet quod omnis consonantia est proportio numeralis.[81]

The syllogistic reasoning articulated here by the OM glossator is clear: since music primarily discusses consonances and since consonances are exclusively founded on commensurable ratios, therefore the musician is solely concerned with the latter kind of

[79] The sources for Book X are probably Eudoxus and Theaetetus. For a fascinating reconstruction of the discovery of incommensurability, see D. Fowler, *The Mathematics of Plato's Academy* (Oxford, 1991), 154-185.

[80] 'Dico quod etiam aliqui soni se habent ad invicem non in proportione numerali; inde sint due corde equaliter tense, quarum una sit equalis diametro quadrati, reliqua coste eiusdem, erit enim que proportio corde ad cordam, ea soni ad sonum, [et] e converso.' (O, fol. 5v; M, fol. 7v).

[81] O, fol. 3r; M, fol. 4r. The anonymous Sankt-Florian commentary on the *De institutione musica* copies a similar statement on the commensurable nature of musical consonances: 'non sit consonantia nisi in illis proportionibus que commensurabiles sunt, id est que in numeris assignantur qui numeri aliquam habent communem mensuram' (*Commentum in musicam Boecii*, fol. 30r; ed. Rausch, 72).

ratios. In the particular case of the semitone, though it is possible to obtain geometrically and empirically (e.g. with the help of strings of a different length) a perfect semitone equal to the exact half of a tone, the latter's being founded on an irrational ratio cannot be considered as a musical semitone.[82]

With such learned introduction of incommensurability into the foundational problem of the semitone, OM ascends to the pinnacle of rediscovered precursors. It has been recently argued that the introduction of the Euclidian notion of incommensurability into music theory discourse and more particularly in relation to the problem of the semitone occurred only in the fourteenth century.[83] In Paris, the polymath Johannes de Muris was supposedly the first to relate the school example of the incommensurable ratio of the diameter and the side of a square to the non-divisibility of the whole tone into two equal parts.[84] Roughly at the same time, in Oxford, Thomas Bradwardine took up the example followed one generation later by the Flemish music theorist Johannes Boen.[85] Yet contrary to Muris, Boen did not deny that an exact semitone could exist in nature (*in natura rerum*).[86] Rather, backing up his statements with the authority of Euclid, he affirmed that it should be geometrically and empirically possible to obtain such a semitone by using proportionate strings.[87] Because of Boen's affirmation, he has been seen as the first music theorist to propose a new object for *musica* by shifting the emphasis from number as constituent of consonance to sound as founded on number.[88]

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[82] 'nullo modo istud est semitonium quo habundat diatessaron a duobus tonis medietate toni, dicitur autem semitonium quasi imperfectus tonus.'(O, fol. 5v; M, fol. 7v).
[83] Hentschel, *Sinnlichkeit*, 151-153.
[84] Johannes de Muris, *Musica speculativa*, A, 152; B, 153; A/B, 108.
[85] See Thomas Bradwardine, *Tractatus de Proportionibus*, ed. L. Crosby (Madison, 1961), 66; Id., *De continuo*, P-Tu, R 4° 2, p. 174. See also Johannes Boen, *Musica*, ed. W. Frobenius (Stuttgart, 1971), 44.
[86] '[V]erum semitonium in rerum natura non existere.' (*Musica Speculativa*, A, 202; B, 203; A/B, 196). See also Hentschel, 'Die Unmöglichkeit', 26.
[87] 'Videtur tamen, quod ymno, quia omnis proportio secundum Euclydium se habet ut linea; nam sicut una linea longior est alia, sic una proportio est alia maior: modo quelibet linea potest dividi per medium. Item si due corde se habeant in proportione equalitatis et intendatur altera continue usque ad proportionem sesquioctavam, non est dubium, quin fiet transitus per medium.' (Johannes Boen, *Musica*, 43).
[88] Hentschel, *Sinnlichkeit*, 152.

Clearly our analysis of the marginal glosses in OM invites us to rethink the chronology of the question. The OM glossator precedes Muris in associating the school example of incommensurability with the problem of the semitone.[89] Furthermore, more than a century before Boen, he also challenged the very foundations of Pythagorean music theory by demonstrating the *actual* existence of the perfect semitone. Thus, contrary to what has been argued,[90] the appearance of a new 'object' (e.g. sound as a numbered continuum) and a new conceptual background for *musica* cannot be linked to the so-called 'new physics' of the fourteenth century but was already maturing in the first half of the thirteenth century.

A closer examination of parallel passages in OM and in Boen's treatise is even more revealing. It seems that Boen follows exactly the same line of reasoning as OM. Both authors proceed by representing sound as a geometrical line. They both use the experiment of the strings to argue that it is actually possible to divide the whole into two equal halves thereby abrogating the old Pythagorean rule regarding the impossibility of finding a mean proportional number between a superparticular proportion. Furthermore, in both cases, causal properties of number remain vital to music theory. The Pythagorean limitation of *musica* to rational ratios, or more precisely, to multiple and superparticular proportions, takes precedence over a completely de-arithmeticized approach to music that would include irrational ratios. As Boen explicitly puts it, it is because 'musica applaudit arithmetice, que inter numeros versatur, in qua omnes proportiones rationales, id est aliquo modo commensurabiles existunt, et non geometrice in qua irrationales inveniuntur proportiones'.[91] In other words, although the two authors acknowledge the existence of a perfect semitone, the conceptual framework remains Pythagorean. Music remains for them a sister discipline of arithmetic dependent upon number theory. Finally, the OM glossator and Boen both

[89] It is noteworthy that the same example also occurs in the Sankt-Florian commentary: 'Unde et diametrum et costa dicuntur esse incommensurabiles quia non habent aliquam communem mensuram assignatam.' (*Commentum in musicam Boecii*, fol. 29v; ed. Rausch, 68).
[90] Henstchel, *Sinnlichkeit*, 152.
[91] Johannes Boen, *Musica*, 44.

make clear that another, more empirical argument stands beside the rational exclusion of the perfect semitone: any interval founded on an incommensurable ratio cannot be musical because it is always extremely unpleasant to the ear.[92] Yet it seems that such a proof *ad experientiam* is for both authors valid only insofar as it is rationally grounded.

In the face of so many similarities one question might legitimately arise: did the OM glossator directly influence Boen? Evidence suggests that this possibility cannot be overlooked. Boen was active at Oxford and both the manuscripts O and M are closely related to England and, in the case of O, to Oxford. Moreover, at one point Boen makes a perplexing reference to a *commentator Lincolniensis* who commented on Boethius' *De institutione musica*.[93] The only thirteenth-century scholar known in the fourteenth century as *commentator Lincolniensis*, thanks to his commentaries on Aristotle's *Physics* and *Posterior Analytics*, is no other than the most famous Bishop of Lincoln, Robert Grosseteste. Boen is the sole author to make a reference to a commentary on Boethius' *De institutione musica* by Grosseteste. There is, of course, a possibility that Boen had been misled by an erroneous ascription. Another possibility is that such a commentary has not yet been identified. The OM glossator can plausibly be identified with Grosseteste.

As Cecilia Panti has already noted, OM's theory of sound generation is attuned to the very idiosyncratic one elaborated by Robert Grosseteste.[94] Because of this striking similarity, she tentatively suggested a possible authorship of Grosseteste for the OM glosses. In fact, other compelling pieces of evidence strengthen the ascription: 1) as we will see shortly, some of the most philosophical passages of OM are also echoed in the works of

[92] Boen first refers to the perfect semitone and then generalizes to all incommensurable ratios: 'quia usque ad hec tempora non placuit talis cantus [i.e. the perfect semitone] saltem a nobis prolatus […]. Sic nec duo soni, qui se in medietate habent duple proportionis, accepti sunt nec simul, nec separatim, qualem facerent due corde, quarum una se haberet ut dyameter, alia ut costa sui quadrati, et sic de aliis, que omnia experientie relinquo auditus.' (*Musica*, 44).

[93] 'quamvis enarmonicum cantum Boetius aptissime dicat coaptatum, forsitan yronice locutus est, ut dicit commentator eius Linconensis [sic!]' (Johannes Boen, *Musica*, 54); see also Boethius, *De institutione musica* I, 21, p. 213.

[94] Panti, 'Theory of Sound', 13-7.

the Bishop of Lincoln; 2) Grosseteste's genuine interest in music is almost legendary;[95] 3) finally, he also manifests a thorough knowledge of Euclidian geometry (including incommensurability) to which he accords a crucial role in the explanation of nature and natural phenomena.[96] Robert Grosseteste therefore appears as an ideal candidate for the authorship of OM. In that case, OM might just be the *commentum Lincolniensis* on Boethius' *De institutione musica* referred to by Boen.

One could object that Boen's quotation from Grosseteste's *commentum* does not appear in OM. As we have seen, O and M derive from a common archetype. The scribe of O selected particular glosses that do not appear in M, and conversely the scribe of M selected glosses that do not appear in O. It is possible that Boen had in his hands another copy of the *commentum*, more complete and more faithful to the archetype than O or M. Therefore, if the glosses of OM are part of a commentary on the *De institutione musica* by Robert Grosseteste, they had a direct influence on Johannes Boen. This would explain the affinities between Boen's treatise and OM. It would also help relativise the so-called novelty of Boen's music theoretical discourse and return the credit for such innovations to OM/Grosseteste.

Now, the tentative ascription of the glosses in OM to Robert Grosseteste also casts a different light on the time and milieu of their composition. Looking more closely at Grosseteste's career, three decades, from *c.*1200 to 1229, remain obscure. Modern scholars assume that he was born to a humble family around the 1170s and that he was in the

[95] Grosseteste makes numerous references to music in his philosophical and theological works. His two main authorities on the matter are Augustine's *De musica* (more particularly Book VI) and Boethius' *De institutione musica*. For instance, music receives the most lengthy treatment in his *De artibus liberalibus* (before 1209; ed. L. Baur, in *Die philosophischen Werke des Robert Grosseteste, Bischofs von Lincoln* [Münster, 1912], 2-7) and Boethius' remarks in *De institutione musica* I, 1 about the supremacy of reason over sense perception are quoted at the beginning of Grosseteste's *Commentarius in VIII libros physicarum Aristotelis* (ed. R. Dales, [Boulder, 1963], 4-6). Furthermore, the Bishop of Lincoln may also have annotated a copy of Augustine's *De musica* (ms. GB-Lbl Royal 5.D.X). See R.W. Hunt, 'Manuscripts Containing the Indexing Symbols of Robert Grosseteste', *Bodleian Library Record*, 4 (1953), 247-8 and 251-2. A list of musical references contained in Grosseteste's works can be found in N. van Deusen, *Theology and Music at the Early University. The case of Robert Grosseteste and Anonymous IV* (Leiden, 1995). Van Deusen's contrived identification of the music theorist Anonymous IV with Robert Grosseteste is totally unfounded and seems anachronistic and far-fetched.

[96] On the central role of geometry in Grosseteste's philosophy, see J. Mc Evoy, *The Philosophy of Robert Grosseteste* (Oxford, 1982), 168-180.

entourage of the Bishop of Hereford at least until the 1200s. After that, Grosseteste's career is well documented from his first lectures in Theology at the Oxford Franciscan Convent in 1229 and then his elevation to the Episcopal See of Lincoln in 1235, up to his death in 1253.[97] According to modern scholarship, a great deal of Grosseteste's philosophical output was written in the decade 1220-1230.[98] I would agree with Panti and say that this decade appears as the most plausible period in Grosseteste's career for the eventual composition of a commentary on Boethius' *De institutione musica*.[99] Determining where Grosseteste indulged in these philosophical activities is more problematic. Up until recently Oxford was considered as the most probable place; however it has been tentatively suggested that Grosseteste could, during the years 1220-1230, have resumed his Arts teaching in Paris.[100] The question remains open.

To conclude, this foray into the geometrical material found in the margins of OM has made clear the uniqueness of this set of glosses and its crucial importance not only for the history of the late medieval reception of Boethius' *De institutione musica* but also, more generally, for the history of music theory. Probably composed by Grosseteste, the glosses contained in OM open a window onto a fascinating approach to music theory at the early university. By articulating Boethius' text with the help of the Euclidian axiomatic method, OM/Grosseteste prefigured Johannes de Muris' influential axiomatised abbreviation of the treatise. Yet, that he brings geometry and music theory together is even more momentous. Not only did he stress the intertextual connections between the *De institutione musica* and the *Elements*, but also and perhaps more crucially, he adopted an unprecedented stance. In the *Glossa maior* the *De institutione musica* was envisioned as a provider of arithmetical

[97] For biographical accounts proposing different views of the three obscure decades in Grosseteste's career see R.W. Southern, *Robert Grosseteste. The Growth of an English Mind in Medieval Europe*, second edn., (Oxford, 1986), xvii-lvi and 3-82; J. McEvoy, *The Philosophy*, 3-48; and J. Goehring, 'When and Where did Grosseteste Study theology?', in *Robert Grosseteste. New perspectives on his Thought and Scholarship*, ed. J. McEvoy (Louvain, 1995), 17-53.
[98] Southern (*Robert Grosseteste*, 131-133) and Goehring ('When and Where', 25-6) propose 1220-1225 whereas McEvoy (*The Philosophy*, 636-41) opts for 1228-1230 as a plausible date for this text.
[99] Panti, 'Theory of Sound', 17.
[100] Goehring, 'When and Where', 35-43.

exercises. OM/Grosseteste was convinced, in contrast, that the same problems could likewise be solved with the tools of Euclidian geometry. The result was a de-arithmeticization and geometricization of certain key problems of Boethian Pythagorean music theory that shook up its very conceptual foundations.

Well before Johannes Boen, OM/Grosseteste accepted the possibility of dividing geometrically and empirically the whole tone into two equal halves. To do so, he introduced the geometrical notion of incommensurability. During the Hellenistic period, the confrontation of incommensurability with Pythagorean arithmetic eventually led to significant mathematical discoveries. Aristotle and Plato considered incommensurability as an incentive for interdisciplinarity in the domains of geometry and arithmetic.[101] Here, this same notion helped OM/Grosseteste to unite the epistemologically distinct disciplines of geometry and music. Furthermore, in applying it to music theory problems, OM/Grosseteste opened up the realm of *musica* to non-Pythagorean elements. Thanks to this 'contamination', the weight of responsibility borne by ratios as the primary outlet for speculations on *musica* shifted to sound conceived as a continuum based on geometric proportionality. On a more ontological level this shift implied that geometrical magnitude rather than number be considered as the primary mathematical structure underlying the physical reality of musical sound. Therefore, contrary to what has been previously thought, this crucial modification of the Pythagorean conceptual paradigm did not appear *ex nihilo* in the ambience of the new Oxonian physics of the fourteenth century, but rather, it was nurtured one century before in the vicinity of the Arts faculty of Paris or perhaps of Oxford by one of the most brilliant minds of the whole medieval period. OM confirms that Grosseteste did not indeed leave musical sound out of his mathematization of physical

[101] See Aristotle, *Posterior Analytics*, 75b4-76b9. See also Plato, *Theaetetus* 147D-148B, *Republic* 527A-528B and *Timaeus* 32A-B.

reality and his geometrical approach to natural phenomena, a process that would reach its apogee one century later in the works of Thomas Bradwardine and Nicole Oresme.[102]

Astronomy

Let us now leave geometry to turn to the last science of the *quadrivium*, astronomy. The most obvious link in the *De institutione musica* between music and astronomy, or should we rather say cosmology, stems from the idea, common in Antiquity and in the Middle Ages, that there exists an everlasting Harmony of the world. This Harmony, reflection of the Divine mind, acts as an ordering and unifying principle based on the same numerical ratios as the ones constituting elementary musical intervals. Correlative to this idea came the common belief, ascribed to the Pythagoreans, that not only was the cosmos harmoniously ordered but also that the celestial spheres produced, in their perpetual revolutions, some sounds not perceptible to the human ear.[103] Boethius was one of the portals through which these two ideas flowed into the Latin Middle Ages. In his famous tripartite classification of music (*De institutione musica* I, 2) he introduced the category of *musica mundana* or 'mundane music'. *Musica mundana* was that branch of the science of music concerned with the perfect order and harmony of the heavens, with the harmony uniting the diverse and opposing forces of the four elements and finally, with the harmonious unification of the various seasons into a yearly cycle. Concerning more precisely celestial harmony, Boethius clearly implied that it was impossible that the extremely rapid motion of such large bodies should produce no sound. It is along those lines that one needs to interpret Boethius' rhetorical question: 'Qui enim fieri potest, ut tam velox

[102] See the excellent study by J. Murdoch, '*Mathesis in philosophiam scholasticam introducta*. The Rise and Development of the Application of Mathematics in Fourteenth Century Philosophy and Theology', in *ALPMA*, 215-254.

[103] For comprehensive overviews of the various Antique and Medieval theories concerning the harmony of the world and the music of the spheres, see notably J. Goldwin, *Harmonies of Heaven and Earth* (London, 1986) and L. Spitzer, *Classical and Christian Ideas of World Harmony* (Baltimore, 1966).

caeli machina tacito silentique cursu moveatur?'[104] In accordance with his Greek and Latin predecessors, Boethius also reported the famous analogy that associated each planet with a particular string of the Greek tetrachordal system, thus constituting a 'planetary scale'.[105]

In the thirteenth century, the penetration of Aristotle's cosmology, first indirectly through Arabic sources and then through the institutionalised reading of his *De caelo* at the universities, profoundly challenged the idea of cosmic music. Positing continuous and homogenous concentric spheres, composed of a fifth element, ether, and subjected to uniform circular motions, Aristotle invalidated, on physical grounds, the very possibility of a sonorous harmony of the spheres.[106] Were thirteenth- and fourteenth-century glossators of Boethius' *De institutione musica* aware of Aristotle's critique? If so, what was the exact impact of Aristotelian cosmology on the interpretation of the Boethian *musica mundana* in the sets of glosses under scrutiny? Since Aristotle's *De caelo* was part of the formal curriculum in the Arts faculty of Oxford and Paris, to answer these questions will certainly help to illuminate chronology and the broader intellectual and institutional context for these marginalia.

Boethius' succinct and somewhat vague account of *musica mundana* invitingly leaves considerable room for interpretative manoeuvre. Three thirteenth- and fourteenth-century glossators, B_2, OM/Grosseteste and C, develop a personal view on the question.[107] Unsurprisingly maybe, all three glossators operate within an Aristotelian cosmological framework. In this respect, they can be singled out as genuine departures from the *Glossa maior*. Yet, a crucial distinction must be drawn between OM/Grosseteste and the B_2 glossator on the one hand, and the C glossator on the other hand. Whereas the latter adheres

[104] Boethius, *De institutione musica*, I, 2, p. 187.
[105] On Boethius' planetary scale (*De institutione musica* I, 27, p. 219) see more particularly R. Bragard 'L'harmonie des sphères selon Boèce', *Speculum*, 4 (1929), 206-213. The most recent account on the various Antique and Early Medieval conceptions of the planetary scale is M. Teeuwen, *Harmony and the Music of the Spheres: The Ars Musica in 9th-Century Commentaries on Martianus Capella* (Leiden, 2002), 190-232.
[106] See for instance *De caelo* II, 4 (286b25-287a10) or II, 9 (290b12-291a28). For a clear and detailed introduction to Aristotle's concentric cosmological model see L. Elders, *Aristotle's Cosmology* (Assen, 1966), 1-26.
[107] B_1 simply copies the *Glossa maior* and P has no gloss on this passage.

to a strict Aristotelian position and inveighs against the very existence of cosmic music, OM/Grosseteste and B_2 doggedly advance what can be termed a 'concordist' explanation of the phenomenon. Let us now analyse each of these three positions regarding the music of the spheres with a view to recontextualising and deconstructing the model proposed by each author.

OM/Grosseteste's approach to sound generation has already been analysed in detail elsewhere.[108] Thus, in order to fully comprehend his description of the music of the spheres, it should suffice to recall a few important points. In short, for OM/Grosseteste sound is embodied light, or to put it differently: 'Lux…subtilissimo et tenuissimo aere incorporata est sonus'.[109] From this idea of sound as embodied light, the scholiast explains the mechanism of sound production by combining the Boethian definition of sound as 'percussion of the air' (*percussio aeris*) with the Aristotelian theory of 'natural place'.[110] When a body is violently struck, some of its parts are forcibly removed from their natural place, eventually returning in a motion similar in intensity to the original percussive impulse. As a result, some particles of incorporated light are propelled out of the moved body, producing sound. Then, the parts of the moved body, carried away by the first impulse, oscillate around their natural place before returning to rest. All these motions combine to produce a single perceived sound, which is determined by the quantity of air-incorporated light released. This, in turn, is proportional to the degree with which the parts

[108] See Panti, 'Theory of Sound', 3-17.

[109] O, fol. 3r; M, fol. 3v. Also quoted in Panti, 'Theory of Sound', 14. It is noteworthy that this theory was severly criticized in Oxford *c*.1250. In his unedited commentary on Aristlotle's *De sensu et sensato*, the English master Geoffrey of Haspall formulated a question to invalidate the opinion of 'certain people' who state that: 'sonus est lux incorporata in subtili aere [*ms*. aereo] et hoc volunt ostendere per hoc quod multiplicatio soni est a centro ad circumferenciam, talis autem est multiplicatio lucis, ut dicunt.' (Geoffrey of Haspall, *Questiones super De sensu*, I-TOc 23, fol. 120va).

[110] See Boethius, *De institutione musica* I, 3, p. 189. At the end of *Physics* IV, 5 (212b29-213a1) Aristotle defines natural place as the limit of a containing body which is similar in kind to the contained body. The relation of a contained body to its natural place is, for the Stagirite, one of parts to a whole. For a general appraisal of Aristotle's theory of natural place see particularly K. Algra, *Concepts of Space in Greek Thought*, (Leiden, 1995), 195-221.

of the moved body are displaced from their natural place, and thus to the intensity of the original impulse.[111]

The introduction of the Aristotelian notion of natural place into an explanation of sound generation is also instrumental in accounting for the music of the spheres. Following Aristotle, OM/Grosseteste argues that, because of their particular nature, the celestial bodies are not 'things subject to change, division or condensation'.[112] Their indivisibility and uniform motion prevent them from being displaced in any way from their natural place. In this respect, the celestial bodies are unable to generate any sound in their revolution, simply because: 'Non est igitur sonabile quod per violentiam non potest constringi et dilatari, cuius natura possit partes per violentiam a naturali situ egressas in situm naturalem reducere.'[113] Therefore, contrary to sublunary bodies, light is not incorporated within celestial bodies, but rather constantly produced by them. Once this light is diffused, it penetrates inside the air and, according to the degree of 'subtlety' of the air, it reaches us either as a visible or as an audible nature.[114] Unfortunately because of the limitations of our sense of hearing we are

[111] 'Quia lux est incorporata non semper agit, sed oportet ut corpus in quo corporatur violenta percussione quasi in se ipsum concciciatur et egrediatur lux cum subtillisimo aere illius corporis ad auditum, non deserit tamen a quo egreditur. Iste autem transitus non fit nisi per aerem. Quia ergo diffinitur vox sive sonus percussio aeris […] Cum per violenciam egresse sunt partes corporis a situ naturali, natura eas inclinat et movet ad situm naturalem. Cumque inclinatione prima reduxerit partem aliquam ad suum situm fortitudine impulsus nature contingit quod transit situm. Quapropter eandem partem per viam oppositam secundo inclinat et movet ut ad situm naturalem redeat, cumque rursum pervenit ad situm naturalem forsitan excedit illum situm fortitudine nature impellentis donec tandem motu paulatim descrescenti cesset huius ictus et redditus. Necesse est ergo quod sonat quamdiu sonat tremore et totum sonum ex multis sonis esse compositum sicut totus motus corporis tremebundi ex multi motibus componitur. Maior itaque virtus inclinans partes corporis concussi ad situm naturalem velocius eas movet et numerosius, minor virtus et minus numerose. Sicut igitur est proportio virtutis ad virtutem sic erit proportio velocitatis ad velocitatem et ita proportio numeri motuum ad [numerum *add. M*] motuum et similiter soni ad sonum. Soni naturam ad sonum est proportio sicut lucis incorporate egredientis que est substantia soni ad lucem aliam incorporatam. Maior autem virtus lucem subtiliorem egredi facit, et minor grossiorem sicut videmus in hiis que emittunt lucem visibilem quod lucens maius magnitudine et potentia eundem aerem subtiliori et clariori perfundit lumine.'(O, fol. 3r; M, fol. 3v). Partly quoted in Panti, 'Theory of Sound', 14. This theory is also expounded with striking terminological similiarities in Grosseteste's *De generatione sonorum*, ed. L. Baur, in *Die philosophischen Werke*, 7.

[112] 'nec passibilia nec partibilia nec condensabilia' (O, fol. 2v; M, fol. 3v). See also Robert Grosseteste, *De luce*: 'Ipsae autem caelestes sphaerae, quia completae sunt, non receptibiles rarefactionis aut condensationis.' (ed. Baur in *Die philosophischen Werke*, 57).

[113] Ibid.

[114] The causality of *lux* in the formation and activity of the senses originally stems from Augustine's *De Genesi ad Litteram* (III, iv, 6). It receives some treatment in numerous works of Robert Grosseteste. On this issue, see McEvoy, *The Philosophy*, 296-8.

unable to perceive this sound.[115] By suggesting that sound is not directly produced in the upper regions but rather when the celestial light reaches the sublunary air, Grosseteste preserves the ethereal nature and continuity of the Aristotelian cosmos.[116] Not only does he maintain the possibility of *musica mundana*, but he also boldly attempts to elaborate a physical explanation of its mechanisms compatible with Aristotle's natural philosophy and cosmological model. Whereas the qualitative properties (e.g. inalterability and permanent identity) of the universe remain in overwhelming agreement with Aristotle, the introduction of a metaphysics of light, Neoplatonic in origin, achieves the hermeneutical kenosis required in order to reconcile harmoniously the peripatetic cosmos with the sounding universe dear to the Pythagoreans.

As we have already said, OM/Grosseteste is not isolated in his struggle to harmonize the authoritative views of Aristotle and Boethius. In a similar vein, the B_2 glossator also strives to unravel the mystery of the sound produced by the celestial bodies by invoking this time not light, but the rays produced by these bodies. The premise is strikingly similar to that of OM/Grosseteste. According to B_2, the continuous sound of the cosmos is in fact not generated by the friction of the spheres in their revolving motions but rather by the incorporation of the planetary rays into the air. The sound produced during this process of incorporation is not audible to us simply because of our poor sense of hearing:

> Nota quod corpora supercoelestia inmittunt radios lineares in aere et ibi incorporantur, et mixtis corporibus sequuntur radii qui quodammodo dividunt aerem [dividit aera *ms.*]. Et fit sonus dulcissimus quamvis non audimus propter debilitatem sensus. Et tamen hunc sonum non inprobat Aristoteles sed sonum generatum ex concentatione.[117]

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[115] 'Sed a corporibus celestibus continue lux diffunditur et penetrat partes huius aeris, et quod illius lucis absque incorporatione in subtili aere venit ad nos visibile est; quod vero in aere subtilissimo de illa luce incorporatur et sic pervenit ad nos quantum est de natura sua audibile est et sonus […] Quapropter sonus ille propter maximam sui subtilitatem in spiritum nostrum audibilem grossiorem non agit.' (O, fol. 2v; M, fol. 3v).

[116] 'Cum igitur sit motus corporum supercelestium continue in partes aeris ibi oppositas continue sonos efficiunt est queque sonus eorum non ubi ipsa corpora sunt, sed in hoc aere ubi ipsa non sunt' (Ibid.). Note that in other tracts, probably under the influence of the Arabic astronomer Albumasar, Grosseteste distinguishes the spheres composed of ether and the stars and planets that are, in contrast, elemental complexions. See Robert Grosseteste, *De sphera*, (ed. Baur in *Philosophische Werke*, 11); *De generatione stellarum,* (Ibid., 35-6); and *De intelligentis*, (Ibid., 112).

[117] B_2, fol. 6v.

This somewhat condensed account indicates a certain acquaintance with the theory of rays developed by the ninth-century Neoplatonic Arabic thinker Abû Yûsuf Ya'qûb ibn Ishâq al-Kindi and known to the Latins through a tract probably translated at the end of the twelfth century under the title *De radiis*.[118] In brief, Al-Kindi argues that each celestial or terrestrial body constantly emits rays by means of which such bodies interact with one another.[119] The rays emitted by the celestial bodies are responsible for the creation and perpetuation of 'heavenly harmony'. All other sublunary beings, Al-Kindi holds, are not only acted upon but also given a power by this heavenly harmony.[120] To him, then, the universe appears as a dynamic tissue of constantly interpenetrating forces that emanate originally from the heavens.

With this philosophical background in mind, the theory developed in B_2 gains a greater significance. Its originality lies in the intertwining of Al-Kindi's dynamic interaction of planetary rays with the Grossetestian theory of sound generation as incorporation of rays into the air. The result is a syncretic theoretical model both compatible with peripatetic cosmology and with Boethian *musica mundana*. In fact, as stated by the glossator, the recourse to the theory of planetary rays to account for the phenomenon of celestial music is but a clever subterfuge to bypass the Aristotelian critique. After all, he asserts, 'Aristotle did not invalidate *this* sound [i.e. the one produced by the planetary rays].'[121]

B_2's seemingly original definition of *musica mundana* is attested to in several tracts composed around the middle of the thirteenth century and related to the Arts faculty of Paris. This reaffirms the putative links between B_2 and this institution. Like B_2, the anonymous author of the introduction to philosophy *Philosophica disciplina* (*c.*1245), followed by the Parisian master Arnulf of Provence, skirts Aristotle's invalidation of the

[118] Al-Kindi, *De radiis*, eds. M.T. d'Alverny and F. Hudry, in *AHDLMA*, 41 (1974), 139-260. Al-Kindi's short treatise was very influential in the thirteenth century, particularly in the domain of optics or *perspectiva*. See for instance G. Federici Vescovini, *Studi sulla prospettiva medievale* (Torino, 1965), 43-7.
[119] Al-Kindi, *De radiis*, 224.
[120] 'Omnia que fiunt et contingunt in mundo elementorum a celesti armonia sunt causata et inde cognosceret quod res huius mundi relate ex necessitate proveniunt.' (*De radiis*, 226-7).
[121] B_2, fol. 6v.

music of the spheres by using Al-Kindi's theory of planetary rays.[122] Yet, the cosmological explanation of *musica mundana* expounded by B_2, the author of *Philosophica disciplina* and Arnulf of Provence was not unanimously accepted. The *doctor mirabilis*, Roger Bacon, sifted this explanation through a mesh of criticism so rigorous that it substantially lost its consistency.[123] More important for us, perhaps, is Bacon's attribution of the 'sounding ray' theory to some *subtilius philosophantes, sapientes* or *magnos viros*.[124] Thus B_2 like the author of *Philosophica disciplina* and Arnulf of Provence probably evolved in the same intellectual circles as the *sapientes* harshly criticized by Bacon, that is to say the Arts faculty of Paris where Bacon taught in the 1240s and where he wrote most of his philosophical works in the 1260s.[125]

However different their descriptions of *musica mundana* were, OM/Grosseteste and B_2 illustrate how doctrines imported from recently translated Arabic and Greek sources in the late twelfth and early thirteenth centuries gave a new basis for speculation about the existence and power of heavenly music, and the possibility of claiming a natural source for them. Equipped with Neoplatonic Arabic guidebooks to Aristotle, the glossators of OM and B_2 could not possibly have achieved the doctrinal readjustments required in order to arrive at Aristotle's cosmology in its purity. It is precisely because the Peripatetic cosmos they inherited from the Arabs was not 'purely' Aristotelian but rather highly heterodox, that they were able to intermingle profoundly the two streams of a distorted Aristotelianism and a well-established Boethian Pythagoreanism that flowed through their thought. The resulting

[122] 'De primo est musica mundana, que non considerat sonum ex collisione corporum supracelestium, quia hoc inprobatur in libro Celi et mundi, set ex radiis istorum corporum intersecantium se et distrahentium partes aeris.' (*Philosophica disciplina*, 267-8; also reproduced in Arnulf of Provence, *Divisio scientiarum*, 327-8).
[123] See Roger Bacon, *Communia mathematica*, ed. R. Steele (Oxford, 1940), 53; and Id., *Opus tertium*, ed. J.S. Brewer (London, 1859), 229-230. In these two texts Bacon resorts to his theory of the multiplication of species to invalidate on a physical ground the 'sounding ray theory'. In the later *Communia naturalium* written *c*.1260 (ed. R. Steele [Oxford, 1936], 408-9), Bacon followed more closely Aristotle's invalidation of celestial music. On Bacon's thought on *musica mundana* see the short remarks by T. Adank, 'Roger Bacons Auffassung der Musica', *AfM*, 35/1 (1978), 45-6.
[124] Roger Bacon, *Opus Tertium*, 229.
[125] See J. Hackett, 'Roger Bacon, His Life, Career and Works', in *Roger Bacon and the Sciences*, ed. J. Hackett (Leiden, 1997), 9-25.

synthetical model for *musica mundana* they promoted was indeed symptomatic of the eclecticism and syncretic accumulation of doctrines that constituted an inevitable first stage of the philosophical renaissance then just beginning in the nascent universities.

Roughly at the same time (*c.*1230-50), however, other masters of the Arts faculty followed another guide, more faithful to Aristotelian cosmology, namely Averroes, whose Commentary on the *De caelo* had just been translated by Michael Scot. For Averroes as for Aristotle, the music of the spheres was an 'error' of the Pythagoreans in the domain of natural philosophy. Any unconditional adherence to this view also clearly implied an excoriation of *musica mundana*. In the context of the interpretation of the *De institutione musica*, this also meant a sheer and unprecedented depreciation of Boethius' authority in the face of that of Aristotle. Such a path was taken by the C glossator, who did not purport to smooth away the contradictions between Aristotelian and Pythagorean cosmologies, as OM/Grosseteste and the B_2 glossator did. On the contrary, the C glossator strongly adhered to a strict Aristotelian position by rejecting at once the very possibility of the music of the spheres.

Commentating on Boethius' affirmation that the stars always produce a sound in their revolution even if the latter cannot be perceived, the C glossator recalls an analogy drawn from Macrobius' *Commentarium in somnium Scipionis*. This analogy had already been invoked in the context of this passage in some manuscripts of the *Glossa maior*: inasmuch as the people who live near the imagined source of the river Nile do not hear the deafening sound of the water falling from very high mountains because they are too accustomed to it, so we do not hear the celestial music.[126] Not really convinced by this argument the anonymous glossator ironically exclaims: 'si ita sit, miror quod fiunt surdi

[126] 'Macrobius auffert signum quod celestium [spherarum] propter magnitudinem non auditur, quia nilus in quodam loco cadit ex altissimo monte et tanto sono quod ab incolis non auditur' (C, fol. 5v; Macrobius, *Commentarii in somnium Scipionis*, ed. J. Willis, [Leipzig, 1970], II, 4, 14, p. 109). Macrobius' analogy is also invoked for this passage in some manuscripts of the *Glossa maior* (*GM*, I, 92-3).

homines illi [!]'.[127] For him, the real reason why one cannot perceive the music of the spheres is simple and of a physical nature:

> Non est ibi sonus, sicut vult Aristoteles in libro de celo et mundo [II, 9]. Quia patet ratione quod non est ibi durum autem solidum. Probatur autem in libro de anima [II, 8] quod ad sonum exigetur m[edium et] percussio solidorum. Certatim hoc magis destruitur ab Averroe super dicto loco[128] ubi destruit rationes The[mistii] volentis defendere istam opinionem.[129]

Because the necessary criteria for sound generation as described in *De anima* II, 8 - i.e. two smooth and hollow bodies striking each other in a medium - are not met in the heavens, sound generation is therefore not physically possible. The most obvious implication is that the glossator envisioned, as a good Aristotelian, the upper regions as homogeneous, continuous and composed of a fifth element.[130]

Besides this argument, there is a direct reference to Averroes' own commentary on the *De caelo*. In the passage in question Averroes refutes Themistius' view according to which we do not hear the tremendous sounds of the spheres because of the great distance that separates them from us. For Averroes this argument does not stand. Since we perceive the heat produced by the stars during their revolution, if they were also producing sound we should also have perceived it. It is noteworthy that apart from the glosses in C another commentary on the *De caelo* mentions this particular passage. This commentary was written *c*.1240 by the very influential English master, Adam Bocfeld.[131] Bocfeld contributed greatly to the diffusion of Averroes' works by quoting him extensively in his own commentaries on

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[127] C, fol. 5v.
[128] Averroes, *Commentum super De caelo*, II, 9, Comm. 53 (Venetiis, 1483), fol. 52va.
[129] C, fol. 5v.
[130] C reaffirms a similar position in another gloss. The glossator takes Boethius' description of motion and striking as two conditions *sine qua non* of sound generation as further evidence of the impossibility to have sound in the celestial region: 'si haec est diffinitio soni universaliter accipiatur pro medio et demonstraretur quod in celestibus non est sonus.' (C, fol. 5v).
[131] Adam Bocfeld's commentary on the *De caelo* is copied in about ten manuscripts. I have used the neat French copy I-Rvat Urb. lat. 206 (13th cent.) where the commentary is copied in the margins of Aristotle's text: '*Et quod dicit Themistius in hoc loco scilicet quod propter remotionem non operantur nihil omnino. Nulla enim est proportio inter magnitudinem illorum corporum et remotionem eorum quia magnitudo eorum est multiplex ad remotionem. Nos autem videmus quod soni proveniunt ex spaciis multo maioribus quam sunt illi*…si ergo *motus stellarum est veloccissimus motuum et maxime in motu diurno*, maximus sonus etiam perveniret ad nos. *Impossibile* est enim *ut perveniat ad nos calor qui fit ex motu eorum* et non sonus' (fol. 142v; direct borrowings from Averroes' *Commentum super De caelo* [fol. 52va] are italicized).

the *libri naturales*. The method of the English master consisted in simplifying Averroes' arguments by providing a montage of key passages that would fit the particular structure of a scholastic literal commentary. It is therefore quite possible that C drew his knowledge of Averroes from the works of Bocfeld which were in circulation in Paris by the middle of the thirteenth century.[132]

In sum, the OM and B_2 glossators implemented Arabic Neoplatonic ideas in the defence of *musica mundana*. For this reason, they provide an excellent window into the early stage of assimilation of Aristotle's natural philosophy at the university, revealing much about the implications of Arabic Neoplatonic ideas that were potentially available for exploitation. Their eclectic and yet original accounts transposed the phenomenon of the music of the spheres in an overwhelmingly Aristotelian cosmos. As a result, the authorities of Boethius and Aristotle were brought into concord. In contrast, the C glossator's Aristotelianism is total. He displays a conspicuously faithful adherence to Aristotle and Averroes regarding cosmological matters. This adherence leads ineluctably to a change of attitude vis-à-vis Boethius' authority. For the first time the authority of the Roman Patrician is properly challenged: his *musica mundana* defined as a sounding music of the spheres is repudiated on a physical ground in accordance with Aristotle's cosmology.

Both the 'concordist' approach in OM and B_2 and the 'criticizing' approach in C were common coin in the Arts faculty of Paris in the thirteenth century, even if the latter eventually superseded the former. Thus, these three sets of glosses represent, each according to its own modalities, an 'artist' reading of the problem of *musica mundana*. They demonstrate that the shift of philosophical paradigm that occurred with the suffusion of newly translated Greco-Arabic peripatetic texts also had an impact on the interpretation and teaching of the Boethius' *De institutione musica*.

[132] See T. Noone, 'Evidence of the Use of Adam of Buckfield's Writings at Paris', *Mediaeval Studies*, 54 (1992), 308-316.

The glosses on *musica mundana* led us beyond the scope of the *quadrivium*, into the realm of cosmology and natural philosophy. It is now time to see whether the assimilation of Aristotle's philosophy is limited to glosses on Boethius' scanty cosmological remarks or whether it is more deeply engrained in the general conceptual framework underpinning the interpretative endeavours of these three glossators.

Natural philosophy

The problem of the music of the spheres instructively brings to light two modes of filtering Boethius' *De institutione musica* through the prism of Aristotelian natural philosophy. On the one hand the OM and B_2 glossators attempted to smooth away the irreconcilable doctrinal differences between the authorities of Boethius and Aristotle by referring to the Neoplatonic cosmological models of notable Arabic authors. The C glossator, on the other hand, consciously demeaned Boethius' authority by correcting and invalidating all doctrines deviating from an 'orthodox' Aristotelian line. In order to analyse further the impact Greek Arabic Peripatetism had on the reception of the *De institutione musica* in the university milieu, let us turn to those philosophical doctrines reported by Boethius that are obtrusively contradictory to significant tenets of Aristotle's natural philosophy. This may reveal what particular philosophical aspects of Boethius' text could have been discussed in an Arts faculty classroom and how they would have been discussed. Hence, it may allow us to gain a clearer picture of what lectures on the treatise might have consisted of. For that matter, certain glosses in OM/Grosseteste and almost all the glosses of C will be of interest. Indeed, both manifest original philosophical concerns and a willingness to compare bluntly Boethius with Aristotle and his commentators. Two points of contention in which doctrinal antagonisms between Boethius and Aristotle are made overt seem to have captivated OM/Grosseteste and C: 1) the *topos* of the effects of music on man

and 2) the general definition of *musica* and its *subiectum* which, as we have seen, was central to discussions on music at the Arts faculty of Paris.

Musical Influence

The whole proem of Boethius' *De institutione musica* constitutes an enthusiastic eulogy of music. The multiplication of examples adduced by Boethius (from the infamous Lacedaemonian Decree to the various anecdotes starring famous musicians, philosophers and physicians of Antiquity) operates as a rhetorical procedure of amplification. These examples emphasize the affectivity and the naturalness of musical experience as well as the intrinsic, ethical and therapeutic powers of music.[133] This *topos* was so deeply ingrained in Antique philosophy that even Aristotle devoted a few chapters of the Eighth Book of his *Politics* to describing the ethical effects of music on men and its role in the regulation of the *civitas*.[134]

Yet on the extent and the modalities of such influence Boethius and Aristotle held diverging views. In fact, most divergences can ultimately be reduced to their respective and antagonistic anthropological designs. Following Plato's *Timaeus*, Boethius asserts that the human soul is an analogy of the world soul, crafted by the Demiurge according to the same series of harmonic numbers that also constitute musical intervals.[135] Thus, the elemental complexion of the body, the different powers of the soul and the relationship between body and soul are determined by the same harmonic ratios as musical consonances. They

[133] Boethius, *De institutione musica*, I, 1, pp. 179-87.
[134] Aristotle, *Politics*, VIII, 5-7.
[135] '[M]undi animam musica convenientia fuisse coniunctam. Cum enim eo, quod in nobis est iunctum convenienterque coaptatum, illud excipimus, quod in sonis apte convenienterque coniunctum est, eoque delectamur, nos quoque ipsos eadem similitudine compactos esse cognoscimus.' (*De institutione musica* I, 1 p. 180). See also Plato, *Timaeus*, 35B.

constitute what Boethius metaphorically terms *musica humana*.[136] It is because of such a structural homology that music is particularly suitable in bringing the soul 'into harmony and agreement with itself', to recall an expression from the *Timaeus*.[137] Though Boethius is not explicit, it seems that his description of *musica humana* also implies a typically Neoplatonic dualism with, on the one hand, the immaterial incorruptible and noble soul, and on the other hand the gross corporeal and perishable body.

The constitutive role played by number in Boethius' description of the soul and body and the dualistic anthropological design he implicitly advocates are in blatant contradiction with Aristotelian thought. For Aristotle, number does not exist as a reified entity partaking in the soul, the body or their union.[138] Furthermore, the soul cannot be considered a harmony because it is neither a composition nor a mixture. The relation between the soul and the body is not of a mathematical nature but rather that of matter to a form.[139] The soul is the *perfectio corporis*, that is, the substantial form and the mover of the body.[140] Such a monistic approach invalidates the possibility of a proportional relation between body and soul, for there cannot be any proportion between matter and form, but only a union.[141]

In short, Boethius proposes a Platonic Pythagorean model in which body and soul are separated and where number appears as the central element linking these two heterogeneous and opposed entities. This model is contradictory to the monistic anthropology of Aristotle where the human soul is united to the body as form to matter. Faced with these two positions, OM/Grosseteste and C adopted different attitudes: the

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[136] Boethius, *De institutione musica*, I, 2, pp. 188-189. It is noteworthy that Boethius describes the union between body and soul as a *quasi consonantia* – an expression which clearly indicates the metaphorical overtones of the whole idea of *musica humana*.

[137] Plato, *Timaeus*, 43D.

[138] Aristotle criticizes at large the Pythagoreans' reification of number on several occasions. For a concise and illuminating explanation of Aristotle's theory of number see *Aristotle's Metaphysics Books M and N*, trans. and comm. J. Annas (Oxford, 1976), 26-41, 62-73, 162-187 and 207-219.

[139] Aristotle sneers at the harmony theory in *De anima* I, 3 and 4 (407b27-408a18). For an enlightening commentary on this passage see W. Charlton, 'Aristotle and the Harmonia Theory', in *Aristotle on Nature and Living Things*, ed. A. Gotthelf (Pittsburg-Bristol, 1985), 131-150.

[140] On the ontolological status of the soul, its definition and its relation to the body see *De anima* II, 1-4, (412a1ff). See also R. Bolton, 'Aristotle's Definitions of the Soul', *Phronesis*, 23 (1978), 258-78; and R. Sorabji, 'Body and Soul in Aristotle', *Philosophy*, 49 (1974), 63-89.

[141] See notably Aristotle, *De anima*, II, 1 (412b5-9); on this Sorabji, 'Body and Soul', 72-6.

former attempted to smooth the differences away with the aid of anthropological models borrowed from Arabic Neoplatonism whereas the latter made no concessions and corrected the flaws in Boethius' account with the help of Aristotle and Averroes. Let us now turn to the solutions devised by these two glossators of the *De institutione musica*, for they provide good examples of how the reception of Aristotelian natural philosophy prompted original philosophical developments in the face of Boethius' treatise.

OM/Grosseteste's conciliatory approach to the problem of musical influence is, above all, highly syncretic. In a novel way, it combines Augustinian and Arabic Neoplatonisms, Aristotelianism and the Galenic medical tradition. Commentating on the anecdote reported by Boethius about Terpander and Arion of Methymna who saved the citizens of Lesbos and Ionia from serious illness with the assistance of a song,[142] OM/Grosseteste develops a rather original theory which shows how the well-proportioned sound of music affects human body and soul:

> Spiritus, ut dicunt phisici, est substantia corporea aerea. Propter hoc cum sonus sit *aer tenuissimus ictus*,[143] magis moventur spiritus per sonum illabentem auribus quam per aliud sensibile quod per alios sensus illabitur magis quod applaudit sono bene proportionato constringunturque contrario. Quapropter cum ex sono convenienter proportionato sequatur spirituum consimilis motio et ordinatio et ex male proportionato sono eorumdem proveniat inordinatio, cumque ex spirituum ordinatione et inordinatione sanitas et egritudo sequantur, patet quod ab egritudine que per spirituum ordinationem solvitur et in illam que per eundem inordinationem accidit pervenitur per modos musicos.[144]

The notion of *spiritus* or 'spirit' is central here and demands further comment. This notion was particularly in vogue in the twelfth and thirteenth centuries and a multiplicity of meanings drawn from different cultural and religious systems was attached to it.[145] The

[142] Boethius, *De institutione musica*, I, 1, p. 186.
[143] 'Philosophi definiunt vocem esse aerem tenuissimum ictum uel suum sensibile aurium, id est quod proprie auribus accidit.' (Priscian, *Institutio grammaticae*, ed. M. Hertz [Leipzig, 1855], 5).
[144] O, fol. 2r; M, fol. 2v.
[145] For the different meanings of the word *spiritus* see J. Bono, 'Medical Spirits and the Medieval Language of Life', *Traditio*, 40 (1984), 91-131. In another gloss the word *spiritus* is taken in a more biblical sense, as opposed to *caro*: 'Dicitur quod tactu maxime delectamur. Dico quod cum homo secundum quid sui sit spiritus, secundum quid caro, et unumquodque quod est in alio est in illo per modum recipientis [M: non per modum sui sed per modum eius in quo est], sed tum caro vero in spiritu sit, cum spiritus dominatur, spiritus vero in carne tum caro dominatur, homo qui secundum spiritum vivit, et ita spiritus est, magis delectatur visibilibus,

meaning of *spiritus* implied here can be understood when measured with the medical tradition. More precisely, the notion of spirit plays a crucial role in the Galenic tradition, which became available in the Latin West from the eleventh century onwards, notably through Constantinus Africanus, Johannitius or Avicenna.[146] According to these authors, the spirits are airy and corporeal substances located in the body. They are made up of the vapours of the four humours (blood, yellow bile, phlegm and black bile). Because the spirits are humoral in nature, their motions hold sway over an individual's constitution by modifying the equilibrium between the different humours. Thus the balance of the spirits actually determines the state of health or illness of the body.

By mentioning the spirits, OM/Grosseteste brings together music and medicine into what can anachronistically be termed a 'music-therapy' approach to the influence of music on man. He provides, therefore, a physiological explanation for the therapeutic power of music on the human psyche and soma. If musical healing had long been common coin in medieval Islam, notably in treatises devoted to the so-called 'spiritual medicine', the information available to the Latin West was limited to vague generalities gleaned in the Latin translations of a few Arabic medical, astrological and philosophical texts.[147] In this context the originality of the OM glosses is all the more remarkable. In fact, the only precedent to such a theory of musical influence is in a passage from an early work by Robert Grosseteste, the *De artibus liberalibus* (before 1209). The doctrinal affinities between OM and the *De artibus* are striking. Both texts emphasize that the well-proportioned sounds of

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qui vero secundum carnem et caro [est], magis tactibilibus, qui vero medio modo, magis consonantiis.' (O, fol. 2v; M, fol. 3r).

[146] A very good description of the medical theory of the spirits is given by C. Burnett, 'The Chapter on the Spirits in the *Pantegni* of Constantine the African', in *Constantine the African and 'Ali ibn al-'Abbas al-Magusi : The* Pantegni *and Related Texts*, eds. C. Burnett and D. Jacquart (Leiden, 1994), 99–120. See also Avicenna, *Liber canonis totius medecinae* (Lyons, 1522), fol. 22vb.

[147] An excellent guide to the relation between music and medecine in the medieval Arabic world is E. Neubauer, 'Arabische Anleitungen zur Musiktherapie', *Zeitschrift für Geschichte der arabisch-islamichen Wissenschaften*, 6 (1990), 227-272; C. Burnett, 'Spiritual Medicine: Music and Healing in Islam and Its Influence in Western Medecine', in *Musical Healing in Cultural Contexts*, ed. P. Gouk (Aldershot, 2000), 85-91.

music could temper the disordered spirits and thus cure illness or even induce certain *affectus animi*.[148]

Yet one of the main differences between the two texts lies in their respective theories of sensory perception. In the *De artibus*, when the body is affected by music or sounding numbers (*numeris sonantibus*), the soul draws numbers out of itself which are of the same proportion, and it moves the spirits according to these proportionate numbers.[149] The numbers present in sound and in the soul through which the due proportion between body and soul is restored are described as *progressores et occursores*. This nomenclature is directly borrowed from Book VI of Augustine's *De musica*.[150] OM, as a possible later work of Grosseteste, follows another line, that of a metaphysics of light. In OM, the active principle of musical perception is not number but rather light. Both the objects and the powers of the senses are the result of the incorporation of the light produced by the celestial bodies within the elemental spectrum, with on one end of the spectrum the unmixed light of sight and on the other end the light weakened by the 'earthy' nature of touch and its objects.[151] This resulting doctrine of sensory perception emphasizes and recaptures the

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[148] A comparison of the following passage with the passage from OM quoted above is enlightening: 'Cum omnis aegritudo et inordinatio spirituum et intemperantia curatur et omnis etiam, qui per ordinationem aut spirituum temperantiam curatur, musicis sanatur modulationibus et sonis, ut etiam credunt phisici [Baur: philosophi] et proportionatos sonos in musicis instrumentis, qui sciat educere, facile poterit, in quos voluerit affectus animi permutare.' (Robert Grosseteste, *De artibus liberalibus*, 4-5; corrected with CZ-Pnm XII E 5, fol. 5ra). The notion of *affectus animi* is introduced in OM in the gloss that immediately precedes the medical description of musical influence: 'Ea tamen que per auditus ingrediuntur plus movent affectiones. Voco autem affectiones uel affectus animi motiones'. (O, fol. 2v, M, fol. 3r). Later, Peter of Auvergne will take up the same idea by stating that the Mixolydian, Lydian and Phrygian modes induce particular motions of the spirits. See Peter of Auvergne, *Continuatio S. Thomae in libros politicorum Aristotelis expositio*, eds. Fr. Raymundi and M. Spiazzi (Turin, 1951), VIII, lect. 2, n. 24. See also Peter of Auvergne, *Quodlibet, VI, 16*, ed. F. Hentschel, in 'Der verjagte Dämon: Mittelalterliche Gedanken zur Wirkung der Musik aus der Zeit um 1300, mit einer Edition der Quaestiones 16 und 17 aus Quodlibet VI des Petrus d'Auvergne', in *Miscellanea Mediaevalia*, 20, eds. Jan A. Aertsen and A. Speer (Berlin, 2000), 414.

[149] 'Cum enim anima sequatur corpus in suis passionibus et corpus sequatur animam in suis actionibus, corpore patiente ex numeris sonantibus extrahit anima in se numeros proportionatos secundum proportionem numerorum sonantium, movetque spiritus ipse easdem numerorum proportiones.' (Robert Grosseteste, *De artibus liberalibus*, 5).

[150] For a succinct and clear analysis of this passage see McEvoy, *The Philosophy*, 257-9.

[151] 'Lux est essentia cuiuslibet sensus et sensibilis, sed non incorporata visibilis est per se et per illam color videtur, subtilissimo et tenuissimo aeris incorporata sonus est, fumo aeris incorporata odor est, humido aeris et grosso incorporata et subtili aque sapor, terreo incorporata tangibile.' (O, fol. 3r; M, fol. 4r). Such a theory of sense perception is also echoed in another gloss (O, fol. 5r; M, fol. 6v) that OM/Grosseteste copies directly from the *Glossa maior* and which can ultimately be traced back to a compressed passage from Augustine's *De Genesi ad Litteram* probably filtered through Eriugena's *Periphyseon*. On this see White, 'Boethius', 165.

perfect symmetry between the object sensed and the medium of the sensory organs. In the case of hearing, both sound and the medium contained in the inner ear are light embodied in the 'most subtle air'. Once again, Robert Grosseteste was, from the 1220s onwards, probably the most fervent proponent of such a theory of sensory perception that he elaborated by absorbing and digesting Arabic and Augustinian Neoplatonisms.[152]

OM unites the theory of the spirits found in Grosseteste's *De artibus liberalibus* with a theory of sense perception based on a metaphysics of light akin to that developed by the same author in later works.[153] The use of such a doctrinal combination to account for musical influence is no mere coincidence. Not only does it cast away any doubts regarding the ascription of OM to Grosseteste, but it also has instructively problematic implications. Indeed, Grosseteste adopts Avicenna's identification of the medical spirits with light, being 'the most subtle thing of bodily nature and therefore close to the soul, which is immaterial without qualification'.[154] To posit the spirits as a *tertium quid* is tantamount to reaffirming the irreconcilable Platonic dualism between the material body and the immaterial soul.

In this context, it seems that Grosseteste's explanation of musical influence in OM bristles with tension. Rather than totally renouncing the radical ontological separation between body and soul promoted in the Platonic tradition, Grosseteste follows Avicenna. He aptly syncopates this idea with Aristotle's conception of the soul as the substantial form of the body. Bridging the distance between body and soul and harmonizing their relationship, OM/Grosseteste's doctrine of the spirits epitomizes an attempt to conciliate and interweave both models into a single syncretic anthropological design loosely compatible with Boethius' *De institutione musica*.

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[152] See McEvoy, *The Philosophy*, 296-9. That Albertus Magnus criticized those who posit 'the light of the spheres mixed with elements' as a medium in sensory organs suggests that such a theory was fashionable in the university milieu of the thirteenth century. See Albertus Magnus, *Commentum in De anima*, II, 3, 11 quoted in Panti, 'Theory of Sound', 12.

[153] On Grosseteste's light-metaphysics, see notably J. McEvoy, 'Ein Paradigma der Lichtmetaphysik: Robert Grosseteste', *Freiburger Zeitschrift für Philosophie und Theologie*, 34 (1987), 91-110.

[154] Robert Grosseteste, *De intelligentis*, 116.

Thus, elated by new medical and philosophical conceptions of the soul and its union with the body that circulated among its contemporaries, OM/Grosseteste gives an unconventional reading of Boethius' description of musical influence. Because of clear Aristotelian and Avicennian infiltrations, this reading breaks with Boethius whose Pythagorean Platonic teaching of music during the medieval period had been uncontested. If like Boethius, Grosseteste accepts the dualizing tendency that differentiates the soul from the body, it is only to preserve at all costs the spiritual nature and the nobility of the soul in the face of the new monistic anthropological design of Aristotle. The medical spirits serve to bridge the distance between the body and its substantial form, the soul. They provide a physiological explanation which accounts for the cathartic and therapeutic effects of music. Such an explanation bypasses the actual existence of a numerical harmony in the human complexion, so dear to the Pythagoreans, while it is compatible with Aristotle's unitarian conception of the soul-body relationship. Furthermore, in order to preserve continuity between the incorporeal and the corporeal, between the Creator and the Creation, OM/Grosseteste, like Boethius, proposes what could be seen as a pantheistic debasement of a transcendent reality. For Boethius, this reality, according to which the Creator educed life to his creation, is Number, but for Grosseteste it is Light. Accordingly, the latter reinterprets Boethius' text in the light of his own philosophical orientations, weaving tightly into yet another syncretic synthesis elements drawn from Augustine, Aristotle and his Neoplatonic commentators, the most prominent and influential of whom was Avicenna.

Heterodoxy and syncretism (all distinctive of the early reception of Aristotle and his Arabic analogates) aptly characterize OM/Grosseteste's highly personal and non-conformist reading of the problem of musical influence. The C glossator adopts another stance. He proposes a new appreciation of the mechanisms of musical influence that challenges one of the central assumptions of Boethius' *musica humana*, namely that music has an influence on man because the human soul is united with the body according to musical ratios. He

purports to demonstrate that this assumption is irrelevant and indeed unfounded. The detailed argumentation unfolded by the glossator is worth attention because it replays wonderfully the clash of authorities endemic to the new reading of the *De institutione musica* through the prism of Aristotelian natural philosophy. Furthermore, it opens a valuable window onto the reception of Boethius' *De institutione musica* in a University context.

Brandishing the standard of 'orthodox' Aristotelianism, C asserts that soul and body are united as form and matter. Accordingly, with such a unitary design in mind, how could the soul-body relation rightfully be termed 'musical'? Even though the association between soul and body can metaphorically be termed 'proportion', it is absurd to surmise that such a 'proportion' is musical for it is neither 'numerical' nor 'sonorous' and is in fact the relation of matter to form.[155] In other words, for the C glossator the very idea of a *musica humana* is in itself preposterous. On that point his opinion recalls the critique of the fourteenth-century Norman music theorist Johannes de Grocheio, probably also a master from the Arts faculty of Paris.[156] In response to those who think that body and soul are united according to musical ratios, Johannes ironically exclaimed: 'Who has ever heard a human complexion resound?'[157] Hence because the *musica humana* is for the C glossator a Pythagorean figment, the argument according to which the soul takes pleasure in music because the same musical ratios also determine its relation to the body does not stand.[158] As in a scholastic

[155] 'Constat quod est proportio anime ad corpus quodammodo sicut materie ad formam. Sicut dicit Averroes in primo de anima quod membra leonis non differunt a membris cervii nisi propter diversitatem animarum cum anima sit perfectio corporis etc…Et nescio videre quomodo ista proportio sit numeralis (sicuti nec materie ad formam) nec etiam sonora, que duo exiguntur ad musicam proprietatem.' (C, fol. 4r). See also Averroes, *Commentarium magnum in Aristotelis de anima libros*, I, com. 53, ed. F. Crawford (Cambridge, 1953), 75; and *Auctoritates Aristotelis,* ed. J. Hamesse (Louvain, 1972), 6, 29.

[156] On Grocheio's biography see Page, *Discarding Images*, 71-3.

[157] 'Nec etiam in complexione humana sonus proprie reperitur. Quis enim audivit complexionem sonare?' (Johannes de Grocheio, *De musica*, ed. E. Rohloff [Leipzig, 1943], 122). See also Radulphus Brito: 'proportio humanorum, hoc est, quod Pythagoras credidit quod ex tali proportione sequeretur quaedam proportio in sonis.' (*Questiones mathematicales*, q. 43, 299).

[158] 'Ad oppositum est opinio pithagoricorum. Non enim oportet quod proportiones aliquae musicales delectant animam [cum secundum] eas sit coniuncta cum corpore.' (C, fol. 4v).

disputation, he justifies his position with five *contra* arguments permeated with references, acknowledged or not, to Aristotle's natural philosophy.

Firstly, since the soul also takes pleasure in qualitative proportions or mixtures that are not of a musical nature (i.e. in mixtures of colours, smells and tastes), it should also be associated with the body according to these proportions.[159] Following Aristotle, the C glossator emphasizes that sense-objects are outside the soul and that they are always particulars.[160] To posit that because we take pleasure in perceiving certain proportioned qualities, the soul is united to the body according to the same proportions, would be as incongruous as to consider that 'qualitates individuales essent principium substantie'.[161] This is why neither musical proportions nor other types of qualitative proportions can be said to determine the union between body and soul.

Secondly, for a pleasant proportion or mixture to occur, one needs two distinct entities that share a common nature.[162] Since the human soul and body are united as form and matter, they are neither distinct nor have a common nature. Therefore they cannot be considered as a mixture but rather as a unity.[163] Hence, the glossator draws the following conclusion: 'Constat autem quod coniunctio anime cum corpore non est secundum diversitatem, ergo coniunctio anime cum corpore non est secundum proportionem delectabilium in constitutione ipsorum delectabilium ex suis componentibus.'[164]

According to the third argument, because the body is subject to change and corruption, its union with the soul cannot always be proportionate. The soul does not always

[159] The example of other forms of qualitative proportions (of colours, smells, tastes) was often used in the Arts faculty of Paris to highlight the ontological specificity of the *numerus relatus ad sonos*. See notably Radulphus Brito, *Questiones mathematicales*, q. 41, 299; Harley Anonymous, *Questiones mathematicales*, q. 4, ed. Hentschel, in *Sinnlichkeit*, 307.
[160] *De anima*, II, 5 (417a20-3); *Auctoritates Aristotelis*, 6, 61.
[161] C, fol. 4v.
[162] C follows here Aristotle's notion of mixture as developped in *De sensu et sensato*, 3 (439b24-9), *De anima*, III, 2 (426a26-426b16) and *De generatione et corruptione*, I, 4 (319b14-19). See also *Auctoritates Aristotelis*, 4, 18.
[163] See *De anima*, II, 1 (412b5-9). See also *Auctoritates Aristotelis*, 6, 43
[164] C, fol. 4v.

derive pleasure from the same proportioned object precisely because of its ever-fluctuating relationship with the body.[165]

The fourth argument set forth in C begins with a verse from Ovid's *Remedia amoris*: 'Enervant animos citharae lotosque lyraeque/ Et vox et numeris brachia mota suis.'[166] This distich emphasizes that music as well as plants, voices and gesticulations excite the soul. According to the glossator, if we take pleasure in such gesticulations and measured motions inasmuch as we delight in music, it is clear that 'erit compositio anime cum corpore non solum secundum numerum sed secundum motum'.[167] This is highly improbable and once again he relies on Aristotle and more particularly on *De anima* (406a21-406b9) and *De motibus animalium* (700b4-701a5) in which the latter refutes the idea, ascribed to Thales of Miletus, that the soul is some sort of motion. The relation of the soul to the body is not of the nature of motion but rather, as Aristotle states, it is akin to that between a mover and a thing moved.

The final argument given by the glossator to invalidate the Pythagorean 'figmentum' of the union of body and soul according to musical ratios is grounded in Aristotle's conception of pleasure and delectation as that which emanates above all from the intellect.[168] It is not because the intellect takes pleasure in understanding that it already contains what it apprehends: 'apprehensio est maxima delectatio et precipue in scibilibus et demonstrabilibus et [intellectus] non est compositus sic.'[169] It would seem that for C, unlike the Platonic *noûs*, the objects of the intellect do not pre-exist in the soul. In fact, according to the glossator, what can be apprehended exists only *in potentia* in the intellect until it is being actualized by the act of apprehension.[170] Thus, the reason why the soul takes pleasure

[165] 'Quod aliquando delectat, aliquando non delectat, et ita aliquando se habet per modum proportionalem ad apprehensibilia, aliquando vero non… Dico [quod] ista vero coniunctio [i.e. coniunctio anime cum corpore] non semper est proportionalis'. (Ibid.).
[166] Ovid, *Remedia Amoris*, vv.743-4.
[167] C, fol. 4v.
[168] See *Ethics*, X, 2 (1177a19-1177b1).
[169] C, fol. 4v.
[170] 'Sed quid apprehensibilis est in potentia ut perficiatur per apprehensionem.' (Ibid.).

in musical proportions has nothing to do with its putative union with the body according to the same proportions. Rather, the soul delights in knowing and in the particular case of music, in the rational (i.e. mathematical) understanding of the musical phenomenon.[171]

The long digression and diatribe by the C glossator, attacking one of the central philosophical claims underlying Boethius' introductory description of musical influence (namely that the soul is united to the body according to musical ratios) illustrate that the attitude towards the Pythagorean Platonic epistemological foundations of Boethius' *De institutione musica* had changed. There is no doubt that this change was only made possible thanks to the rediscovery of Aristotle, gradually encouraged, after an initial period of suspicion, by the nascent universities. To the heterodox anthropological design that lurked behind OM/Grosseteste's interpretation of Boethius' proem, the C glossator substitutes a conspicuously faithful adherence to Aristotle's monistic soul-body relationship. If OM/Grosseteste attempts to conciliate Boethius' *musica humana* with the elements of the new Aristotelian psychology, for the other glossator, the time for conciliations is over. Every aspect of Boethius' thought that contradicts Aristotle's natural philosophy is criticized and invalidated. Now, the doctrines that speak the truth are those expounded by Aristotle and his faithful commentator Averroes. The C glossator makes clear that comments on the *De institutione musica* at the University consisted partly in reaffirming the supreme authority of Aristotle and in crushing any philosophical dissidence that emerged from the treatise.

Defining Music as a Science

Departures from the exegetical tradition of the *De institutione musica* to accommodate Aristotle's tutelary presence are noticeable elsewhere. The second

[171] A similar position can be found in Peter of Auvergne's commentary on Aristotle's *Politics*: 'Istam autem cognitionem veritatis de proportionibus musicalibus consequitur delectatio intellectualis, sicut omnem operationem intellectualem' (*Continuatio*, VIII, lect. 2, n. 2).

philosophical point of contention emphasized in both OM and C concerns the epistemological definition of music. This problem is important because, as we have seen, it constituted a central part of the teaching of music at the Arts faculty of Paris and it was also apparently the central topic of music examinations in the institution.[172] From the extensive *marginalia* in C and to a lesser extent from OM/Grosseteste, it would seem that this topic gave rise to heated discussions.

One of the major divergences between the Pythagorean tradition represented by Boethius and the Aristotelian tradition lies in their respective definitions of the scope of music. Following Plato and the Pythagoreans, Boethius presumes that number is the essence of the material world. This idea implies that music as the science dealing with numerical relations can account for all sorts of natural harmonies. Thus, the realm of music encompasses virtually everything. Such a conception is in blatant contradiction with Aristotle's thought. For him, because number does not exist as a reified entity,[173] the realm of music is not all-encompassing but rather confined to the study of proportioned sounds or consonance. Yet consonance is not for him simply equated to ratio. It is first and foremost a mixture or proportion between two sounds.[174] Capturing the differences between the Aristotelian and Boethian traditions, the music theorist Johannes de Grocheio affirms:

> Magister Pythagoras, primus inventor, et Nicomachus arithmeticus et Plato studiosus, […] et Boetius, ubi Latinus istos est sequens […] isti fundamentum suae positionis accipiunt in hoc, quod proportio, ut dicunt, primo et per se in numeris invenitur et per numeros est aliis attributa. Sed istud fundamentum apud discipulos Aristotelis non est certum. Dicerent enim forte proportionem primo esse inter primas qualitates et formas naturales.[175]

Facing these two irreconcilable positions, OM/Grosseteste and the C glossator adopted two different stances. Here again one can detect the same pattern of evolution outlined above, from the former's blind concordism to latter's convinced Aristotelianism.

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[172] See above Chapter 1, 38-43.
[173] See for instance *Metaphysics*, III, 2 (997b21-22).
[174] On this see *De Sensu et sensato* (439b24-9 and 447b10-13) as well as *De anima*, III, 2 (426b1ff).
[175] Johannes de Grocheio, *De musica*, 43.

In an opening gloss, OM/Grosseteste attempts to delimit the subject matter of *musica* by providing a general definition of the concept of harmony. According to him, harmony (*armonia*) exists in any composite being whose components are neither too similar nor too dissimilar.[176] It can be divided into three main categories, according to the ontological nature of the things that are being combined:

> Armonia dividitur secundum divisionem rerum compositarum. Erit namque armonia aut in compositione earum que omnino sunt essentie stabiles[177] et fixe, aut [in compositione *add*. M] earum que sunt essentie fluentes, ut motus, tempus et sonus, aut in compositione earum que secundum substantiam sunt fixe [sed *add*. M] secundum dispositiones sunt fluentes.[178]

The three categories of essence help segment the realm of *armonia*. They are in fact directly borrowed from Avicenna. In the Avicennian ontology, the *essentie stabiles* are like the separate substances of the Aristotelian tradition; they exist outside matter.[179] In contrast with the stable essences, the *essentie fluentes* (like motion, time and sound) are successive and always transient.[180] Finally, the 'composite' essences are present, broadly speaking, in all material things.[181] Since the aim of this short introductory gloss is to determine the exact subject broached by Boethius in the *De institutione musica*, OM/Grosseteste rejects two types of *armonia* thus delimited. The first type of harmony dealing with the 'stable' or immutable essences is of no concern to Boethius because it lies outside the grasp of mathematicians (*excellet considerationem mathematici*). OM/Grosseteste also discards the third type of harmony, the harmony of the material world that he subdivides, in a manner somewhat reminiscent of Boethius' tripartite division of music, into *armonia mundana* and

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[176] 'In omni itaque compositione est armonia et non ex penitus similibus uel penitus discordantibus.' (O, fol. 1v; M, fol. 2r).
[177] stabiles] stabilis O.
[178] O, fol. 1v; M, fol. 2r.
[179] In his *Philosophia prima*, Avicenna gives the following definition: a stable essence is a 'res habens quidditatem stabilem cuius esse est esse quod non est in subiecto, corpore uel anima'. (*Liber de philosophia prima*, ed. S. van Riet [Leiden, 1977], I, 61).
[180] For the definition of motion and time as *essentie fluentes* see Avicenna, *Liber de Sufficientia* (Venetiis, 1508) fols. 22rb-va and 33va; *Philosophia prima*, I, 130. In his *De anima*, Avicenna defines sound as an 'unstable essence' which does not have a 'fixed being' (*non habet fixum esse*). See Avicenna, *Liber de anima seu Sextus de naturalibus*, ed. S van Riet (Leiden, 1972), I, 165.
[181] Avicenna, *Philosophia Prima*, I, 154.

armonia humana. Accordingly, the *De institutione musica* covers only the second type of harmony, concerned with transient essences, and more precisely, with sound. The subject matter of this *armonia in sonis* and therefore of Boethius' treatise is consonance.[182]

Interestingly, OM/Grosseteste introduces a double ontological separation. First a separation within the canonical tripartite division of music with on the one hand the *armonia mundana* and *armonia humana* (concerned with 'composite essences') and on the other hand the *armonia in sonis* focused almost exclusively on musical consonances. It is noteworthy that OM/Grosseteste equates only the latter form of *armonia* to *musica*. From an epistemic point of view, the result of this separation is obvious: the delimitation of the traditional branches of *musica* moves from the level of the subject matter to a deeper ontological level where the type of beings studied determines the specificity of each branch. The second separation comes with the introduction of a new form of harmony solely concerned with separate substances. Such a separation is somewhat reminiscent of the Aristotelian distinction within the realm of speculative knowledge between on the one hand natural philosophy and mathematics still bound to the material world, and on the other hand the 'prime philosophy' or metaphysics studying being *qua* being, separated from any material determination.[183] This innovation allows OM/Grosseteste to extend the realm of *armonia* beyond the boundaries of the material world to create an all-encompassing concept of harmony closely reflecting Avicenna's ontology and its Aristotelian overtones.[184] Yet, OM/Grosseteste is conscious that the *raison d'être* of harmonic science is above all the *numerus ad esse relatus*, to recall Boethius' own definition of the subject matter of music:

> Similiter dico in omnibus partibus armonice scientie quod subiecta illarum partium sunt partes compositionis in quantum ille partes sunt numeri [ad] esse

[182] 'Non tractavit secundum universalitatem suam sed solum secundum quod reperitur in sonis, et hoc enim non nisi in sonis instrumentorum. Subiectum ergo illius partis armonice scientie quam in hoc libro perficit Boethius est consonancia.' (O, fol. 1v; M, fol. 2r).

[183] For the tripartition of speculative philosophy, see Aristotle, *Metaphysics*, VI, 6. On the notions of abstraction and separation, see the enlightening pages by A. de Libera, *L'art des généralités* (Paris, 1999), 68-83.

[184] The influence of Aristotle on Avicenna's ontology has been analyzed in detail by D. Gutas, *Avicenna and the Aristotelian Tradition* (Leiden, 1988), 185-211.

> relati [...] passiones quoque que probari debent sunt proportiones quas habent partes compositionis ad invicem.[185]

In other words, number still constitutes, above all, the most fundamental epistemic condition for harmonic science. Even in the case of the branch of *armonia* concerned with consonances, number still has precedence over sound. This is corroborated elsewhere by OM/Grosseteste's general position on consonance. Despite his efforts to geometricize music theory problems and his empirical conception of consonance as a blend or mixture of commensurable sounds, he remains deeply anchored in a Pythagorean framework. OM/Grosseteste straddles the fence between rationalism and empiricism by reaffirming on several occasions the strict Pythagorean rule according to which only the intervals based on the first multiple and superparticular ratios are deemed consonant.[186]

Thus, OM/Grosseteste achieves conciliation between Boethius and Aristotle on two fronts. First he rehabilitates sound in his definition of consonance even though number remains the ultimate criterion of determination. Secondly, while he preserves the all-inclusive Pythagorean *armonia*, its categories are redefined according to Avicenna's ontology. Nevertheless, at the same time, the ontological separation of sounding harmony from the other forms of harmony (*humana*, *mundana*, or *metaphysica*) constitutes a first step towards the narrowing down of the subject matter of music advocated by Aristotle.

When we turn to C, the approach to the problem further departs from Boethius' Pythagoreanism. We have already seen how this glossator dismisses the possibility of both *musica mundana* and *musica humana*. Such a narrowing down of the realm of music is directly linked with the C glossator's unconditional adherence to Aristotelian natural philosophy, a practice that was in fact common coin at the Arts faculty of Paris. For

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[185] O, fol. 1r; M, fol. 1v.

[186] 'Cum enim omnis consonantia sit duorum sonorum suavis mixtura, non misceantur autem suaviter quocumque modo sint commensurabilia, sed solum si alterum mensuret relinquum uel eorum differentia mensuret utrumque; in solis autem multiplicibus ita est quod altera extremitas mensurat reliquam, in solis superparticularibus differentia alterius ad alterum mensurat utrumque, quod totum scitur ex scientia numeri, manifestum est quod omnis consonantia est multiplex uel superparticularis pars proportione.' (O, fol. 3v; M, fol. 4r).

instance, Radulphus Brito considered *musica mundana* as preposterous and could only accept *musica humana* once it had been redefined as vocal music.[187] The Paris-trained music theorist Johannes de Grocheio also casts aspersions on those 'ignorants of logic and natural philosophy' (*naturam et logicam ignorantes*) who still believe in *musica mundana* and *musica humana* because they prefer to follow the Pythagoreans rather than truth itself.[188] The affinities the C glossator has with the line of thought about music developed in the Arts faculty of Paris in relation to the reception of Aristotle's natural philosophy also extend to his definition of the *subiectum* for the discipline.

Like the masters from the Arts faculty of Paris, the C glossator posits consonance as the main topic of Boethius' treatise. Yet for him consonance cannot be equated simply with ratio. Talking about the first book of Boethius' *De institutione musica*, he affirms:

> Agit enim de principiis musice formalibus ut sunt que cadunt in diffinitionem consonantiarum ut numerus et huiusmodi. Quod patet cum dicitur 'diapason est proportio duorum ad unum', sic enim dicitur secundo *Phisicorum*.[189] Et verum est in mathematicis quod partes in diffinitione forme sunt et quedam talium sunt propinquiores, quedam remotiores.[190]

Thus, following the Philosopher (*Physics* II, 3), the anonymous glossator considers numerical ratio to be the formal cause of musical consonances. This position was not only shared by prominent masters, for instance, Thomas Aquinas and Albertus Magnus, but also by such an important music theorist as Johannes de Grocheio.[191] As we shall see in Chapter 3, it characterises the dominant view of the Arts faculty according to which music is defined as a *scientia media* dealing with an ontologically ambivalent subject matter, partly physical and partly mathematical.

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[187] See above Chapter 1, 43.
[188] Johannes de Grocheio, *De musica*, 46.
[189] *Physics*, II, 3 (194b27-28).
[190] C, fol. 5v; partly quoted in *Commentum Oxoniense*, 53.
[191] 'De sono vero harmonico, quia est materia propria, circa quam operatur. Per numerum etiam eius forma designatur' (Johannes de Grocheio, *De musica*, 46). On the opposition form/matter in Grocheio's treatise see E. Fladt, *Die Musikauffassung des Johannes de Grocheo im Kontext der hochmittelalterlichen Aristoteles-Rezeption*, (Berlin, 1987), 72-79; M. Bielitz, 'Materia und forma bei Johannes de Grocheo', *Musikforschung*, 38 (1985), 257-277. For Thomas Aquinas and Albertus Magnus' position on consonance, see below Chapter 3.

Number, as the form of musical consonance, enters into its definition and is therefore of a central interest to the musician. Now, contrary to Boethius, number is in C a quantitative metaphor used to describe reality rather than reality itself. The ratios that define consonances can be grasped rationally through a cognitive process of abstraction; they do not 'exist' separated from matter. The numerical foundation of consonance is therefore an abstraction. Such a nuance between abstraction and separation in the knowledge of mathematical entities precisely represents one of the most widely disputed issues between the Platonic and the Aristotelian traditions. In accordance with Aristotle's inductive gnoseology, the glossator is aware that the abstractive process, which ultimately leads to knowledge of the causes of musical consonances, always starts with sense perception and cannot totally exclude 'matter' (i.e. sound and its qualities) from consideration. He recalls Aristotle's affirmation that even though mathematical entities can be abstracted from sensible matter they cannot be separated from 'intelligible matter' nor from the 'prime matter' posited as a sine qua non condition of existence:

> Quantitates mathematice non determinant sibi subiectum et ideo abstracte sunt a motu naturali et materia inquam sensibili, que est subiectum in esse sensibili constitutum, quoniam non separatur a materia intelligibili sicut vult Aristoteles in Metaphysica [VI, 1 (1026a7-10)], nec etiam a prima materia in rei iunctione, quia sunt ultima eius sicut vult in libro primo Generationum [I, 4 (319b14-19)].[192]

Thus, if Boethius, following the Pythagoreans, solely focuses on ratio theory in his description of the 'principles' of music, the C glossator, as a good Aristotelian, emphasizes that the musician must also take into consideration the 'matter' of consonances, namely sound. Bringing back sound into the realm of music is precisely what was intended by the redefinition of the *subiectum* of music as *numerus relatus ad sonos* at the Arts faculty of Paris.

[192] C, fol. 15r. On the ontological implications of the Aristotelian concept of matter, see K. Fine, 'Aristotle on Matter', *Mind*, 101 (1992), 35-57.

Since musical consonances are physical entities with a mathematical form, the role of sense perception becomes crucial. For the C glossator, two sounds do not really mix until they are perceived by the ears.[193] Refuting Boethius' denunciation of the fallacies of sensory perception, he restates with Aristotle that this act of sense perception is flawless for it is responsible for 'the coming to be' of consonance.[194] Indeed, for C errors of perception must not be attributed to the power (*virtus*) of perceiving itself but only to the sensory organs that are subjected to corruption and decay.[195] In addition, sensory perception imposes certain limitations on the phenomenon of consonance. For instance, an excessively loud consonance will not be perceived as such. It will on the contrary damage the sense of hearing.[196] Johannes de Grocheio and Jacobus Leodiensis maintain very similar positions which directly derive from Aristotle's conception of sensory organs as a kind of ratio.[197]

Yet, no matter how adept sense perception is, C is also aware that the nature of a thing can be properly known only with the help of reason. In other words, if one possesses an acute and well-balanced sense of hearing then one will never fail to hear a consonant interval. However, it is only with the help of reason that one is able to explain why such an interval is consonant by discovering the ratio on which it is founded.[198] On that point the C

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[193] 'Non esse veram coniungtionem sonorum in medio antequam aliquid inde perveniat ad sensum.' (C, fol. 13v).

[194] 'Sensus non errat in proprio sensato, secundum Aristotelem.' (C, fol. 7r). See Aristotle, *De anima*, II, 6 (418a14-5); *Auctoritates Aristotelis*, 6, 66.

[195] 'Ita quod tam sensus quam sensatum rite se habeant secundum se et secundum medium. Ista ergo inequalitas et error in sensibus circa propria sensata est de inequalitate materie organi maxime et non virtutis que de se est incorruptibilis. Unde si senex acciperet occulum pueri adeo bene videret ut puer. Sed quia nullum materiale potest effugere contrarietatem et maxime mixtum, est ibi continua debilitatio per actionem et passionem contrariorum ad invicem et visum semper ad sua sensibilia.' (Ibid.). The example of the old man is directly borrowed from Aristotle, *De anima*, I, 4 (408b20-22); *Auctoritates Aristotelis*, 6, 15.

[196] 'Soni tonitrui non enim consonantiam faciunt […] et causa est quia sensus est proportio quedam et ideo corrumpitur a disconvenienti et excellenti.' (C, fol. 3r).

[197] 'Quod non videtur intuenti sonum tonitrus cum alio ei habente proportionem. Non enim harmoniam faciunt, sed potius organum auditus corrumpunt' (Johannes de Grocheio, *De musica*, 43). 'Adhuc sensus non bene percipit minima sensibilia, similiter nec maxima. Sunt enim haec sibi improportionata, cum sit virtus organica. Unde excellentiae sensibilium sensum debilitant et quandoque corrumpunt; patet de tonitruo et coruscatione.' (Jacobus Leodiensis, *Speculum musicae*, I, 29, p. 87; see also IV, 8, pp. 15-16). See Aristotle, *De anima* III, 2 (426a25-b3) and III, 13 (435b4-19), and *De sensu et sensato* 3 (439b28-440a3). See also *Auctoritates Aristotelis*, 6, 104 and 179. For an analysis of these passages see A. Barker, 'Aristotle on Perception and Ratios', *Phronesis*, 26 (1981), 248–66.

[198] 'Nota quod per sensum fit acceptio confusa […] non enim cognoscit res nisi cum cognitione causae et elementa eius itaque maxime explicantur per diffinitionem que maxime amplectur ab intellectu.'(C, fol. 4r).

glossator echoes the opinions of such eminent music theorists as Johannes de Muris and Jacobus Leodiensis who were both trained at the Arts faculty of Paris.[199]

By rehabilitating sensory perception, the C glossator restores the aural dimension to a central position, a position that Pythagorean rationalism had denied to it. The result is a more physical and empirical conception of musical consonances. Central to this conception as we shall now see, is the Aristotelian notion of mixture.[200] Though this notion was present in the *De institutione musica*,[201] Boethius never directly compared it to the rational doctrine of the Pythagoreans. In a way, Boethius left the apparent paradox of rationalism and empiricism unreconciled.[202] It is only with the reception of Aristotle's natural philosophy in the thirteenth century that the Aristotelian notion of mixture could be juxtaposed to Pythagorean rationality. The C glossator appears as an early advocate of such a juxtaposition.

For him, a consonance is above all a 'mixture of opposite sounds'.[203] To elucidate the notion of 'mixture' Aristotle's *De generatione* is called upon:

> Ita est in virtute miscibilium quod est quedam natura communis mixtis, et hoc forte intendebat Aristoteles in capitulo de mixtione in libro *De generatione* cum dicit: *quando in potentiis adequaentur miscibilia qualiter tunc transmutatur alterum in dominans ex sui ipsius natura, non generatur autem alterum sed medium commun*e.[204]

Certain conditions must be met for two distinct entities to mix into a single one. In order to blend harmoniously and thus create a consonance, two sounds must be clearly distinct but nevertheless possess common physical qualities (in terms of sonority, intensity, timbre) in

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[199] 'Si auris bene disposita quantum ad ea quae contingunt circa sonum non fallatur, tamen de numerorum proportione discernere non est suum, sed est rationis opus.' (Johannes de Muris, *Musica speculativa*, A, 94; B, 95; AB, 26). See also Jacobus Leodiensis: 'Et si verum sit sensum non decipi circa proprium obiectum, si adsit ibi debita dispositio organi medii et debita distantia obiecti, decipi tamen potest circa commune obiectum. Numerus autem sonorum obiectum commune est.' (*Speculum musicae*, I, 29 p. 87 and II, 6, p. 22).

[200] The most comprehensive description of the Aristotelian notion of mixture is K. Fine, 'The Problem of Mixture', *Pacific Philosophical Quaterly*, 76 (1995), 266-369.

[201] *De institutione musica* I, 28-9, pp. 220-1 and I, 3, pp. 189-191.

[202] The problem of the inclusion of the eleventh (*diapason cum diatessaron*) advocated by Ptolemy against the Pythagoreans brings forth such a paradox. On this see below Chapter 4.

[203] 'Consonantia fit ex comixtione contrariorum sonorum.' (C, fol. 13r).

[204] C, fol. 13r; quotation from *De generatione et corruptione* I, 10 (328a28-31) in italics. C apparently used the text of the *translatio vetus* made directly from the Greek.

order to form a third entity.[205] This is why when two sounds are too markedly disparate they cannot blend to form a consonance, even if they are founded on a ratio.

Thus, correlatively to his rehabilitation of sense perception the glossator reinserts a qualitative dimension in his description of musical consonances. For him, consonances are not simply ratios but above all proportioned mixtures of sounds perceived by a listener. Determining what is consonant is no longer hearing the numerical truth inherent in nature but rather devising a theory harmonious with hearing. Though reason remains essential for an understanding of the cause of consonance, sound and hearing must now also be taken into account.

To recapitulate, the C glossator's description of consonance has to be understood in the context of his critique of the all-encompassing Platonic Pythagorean notion of numerical harmony. Both participate in the narrowing down and redefinition of the subject matter of *musica* in accordance with Aristotle's natural philosophy and epistemology. This redefinition was central to the teaching of music in the Arts faculty of Paris. If OM/Grosseteste does not achieve such an Aristotelian redefinition, it is because he wants to preserve at all cost the all-encompassing *musica* dear to Boethius and the Pythagoreans.[206] OM/Grosseteste's heterodox Aristotelianism proves instrumental in conciliating Aristotle and Boethius on the question of the epistemological definition of *musica*.

In contrast, the C glossator does not seek to harmonize the doctrinal antagonisms. His adherence to Aristotle is total. Not only does he rehabilitate sense perception in accordance with Aristotle's inductive method and gnoseology but he also, correlatively, demotes number and ratios from the status of the undisputed and unique cause of musical

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[205] The C glossator associates with this common nature the notion of measure as defined in *Metaphysics* X, 1: 'Illud quod est primum et simplicius in unoquoque genere, sicut dicitur in X Metaphysice [1053a24] quod in unoquoque genere est unum tale, et de istud quoddam exemplum est in albo et nigro in coloribus, ubi dicit Averroes quod non sunt colores compositi ex duobus sicut albo et nigro quia nigrum est privatio albi sicut obscuritas lucis, ergo in coloribus non est principium et mensura nisi unicum.' (C, fol. 13r). See Averroes, *In Aristotelis Metaphysicorum libros*, *Opera omnia 8*, (Venetiis apud Junctas, 1562), fol. 256vb H-I. See also *Auctoritates Aristotelis*, 1, 239.

[206] This is also notable in his commentary on Aristotle's *Posterior Analytics*. See below Chapter 3, 161-2.

consonance, to that of a component. This is achieved through the introduction of the Aristotelian notion of mixture. Consonance has now to be understood materially as a mixture of sound and formally as a ratio abstracted from the sounding mixture by the intellect. Such a definition bears striking similarities with Johannes de Grocheio's effort to reinstate sound as a determining dimension in consonance theory. It is also very similar to the long and extensive description of consonance given by Jacobus Leodiensis in Books II and IV of his *Speculum musicae*, where sound, the Aristotelian notion of mixture and sensory perception, also plays, alongside ratio, a central role.[207] Perhaps this is no mere coincidence. After all, Jacobus Leodiensis studied at the Arts faculty where he attended lectures on the first two books of Boethius' *De institutione musica* and Johannes de Grocheio probably also frequented this institution. The glosses preserved in C may well be the written record of formal lectures on the first two books of Boethius' *De institutione musica* similar to the ones Jacobus and perhaps Johannes attended, lectures deeply entrenched in the fertile philosophical soil of Aristotelianism.

Conclusion

The analysis of three categories of glosses (exegetical, mathematical and philosophical) provides a solid ground on which to date and relocate in their intellectual milieu the heterogeneous thirteenth- and fourteenth-century sets of glosses on Boethius' *De institutione musica* studied in this chapter.

[207] See for instance Jacobus' general definition of consonance: 'Consonantia, primo modo sumpta, dicitur de mixtione sonorum omnium distinctorum aequalium vel inaequalium, sive illorum mixtio dulciter et concorditer auditui se faciat, sive non, dum tamen ad certam reducibilis sit proportionem in numeris, sive illa sit simplex, sive mixta' (*Speculum musicae* II, 3, p. 17). In addition Jacobus' central concept of *harmonica modulatio* defined as the formal determination of consonance is described as 'distinctorum sonorum unio, mixtio, proportio vel proprietas in medio ad auditum se diffundens, ad certam reducibilis in numeris proportionem.' (*Speculum musicae*, II, 2 p. 14). For further details on Jacobus' definition of consonance see Hentschel, *Sinnlichkeit*, 44-67.

The glosses in P and B_1 appeared to correspond with the hermeneutical tradition of the *Glossa maior*. Their almost exclusive arithmetical focus coupled with a lack of references to the newly introduced Greek Arabic Peripatetism indicate that these two sets of marginalia were elaborated, perhaps even prior to the thirteenth century, in an intellectual milieu other than that of the University of Paris.

In contrast, the glosses in OM, B_2 and C have all displayed, to various degrees, obvious links with the university milieu. More precisely, these sets of glosses bear similarities with the image of music teaching at the Arts faculty of Paris outlined in Chapter 1. Departing from the traditional arithmetical speculations linked to the orthodox exegesis of the *De institutione musica*, each of these three glossators takes different orientations.

The B_2 glossator provides clear and succinct content summaries for the entire treatise sometimes adorned with Arabic numerals. Using scholastic tools of literal commentary such as the *divisio textus* in vogue in Paris *c*.1230-60, he reduces the treatise to its essential points. His rudimentary *accessus* at the beginning of the treatise, his exclusion of most numerical digressions from his summaries and his emphasis on the logical articulation of Boethius' argument recall *Abbreviatio in musicam Boecii*. Yet, the glosses in B_2 are far from being as systematic and rigorous as the well-crafted abbreviation. Even so, they still facilitate the retrieval of information concealed in the treatise. This set of glosses may then represent reading notes jotted in the margins by a master of Arts who wanted to gain an easier access to the *De institutione musica*. If most of the time B_2 cleaves to the *littera*, his conception of *musica mundana* reveals an acquaintance with the heterodox Aristotelian cosmology of Al Kindi that circulated in the 1240s at the University of Paris. This confirms a possible date and location for these glosses of around 1230-60 in Paris, although an Oxonian provenance cannot be dismissed.

As probably the most elaborate and original set of glosses on the *De institutione musica*, those of OM can now be ascribed to Robert Grosseteste. In OM, Grosseteste

develops a markedly idiosyncratic approach to the treatise. He is the first to read the *De institutione musica* through the lens of Euclid's *Elements*. In his commentary, Grosseteste's mastery of Euclid's *Elements* goes far beyond a cursory knowledge of the first six books prescribed in the curricula of the Arts faculties of Paris and Oxford. He rearticulates Boethius' treatise according to the Euclidian axiomatic method, adumbrating Johannes de Muris' *Musica speculativa*. Even more innovative, perhaps, is Grosseteste's geometrically-based approach to problems central to Pythagorean acoustics and number theory such as the problem of the non-divisibility of the whole tone into two equal halves. Such geometrization of music theory shakes the very Pythagorean foundations of the *De institutione musica*, notably by introducing the notion of incommensurability into the realm of music theory. With his commentary on Boethius, Grosseteste appears as a hitherto overlooked harbinger of the novelties codified over a century late by Johannes Boen in his *De musica*, probably under the former's influence. Thus, more than a century before Thomas Bradwardine and Nicolas Oresme, Grosseteste did not leave musical sound out of his analysis of physical reality *more geometrico*.

In addition, the originality of Grosseteste's interpretation extends to his reading of the more philosophical aspects of the *De institutione musica*. Accordingly, he reinterprets Boethius' text in the light of his own philosophical orientations, tightly weaving into yet another syncretic synthesis elements drawn from Augustine, Aristotle and his Neoplatonic commentators, the most prominent and influential of whom is Avicenna. His metaphysics of light, his theory of sound generation, his division of the soul, his notion of *spiritus* as a *tertium quid*, his reading of Avicennian ontology, are all used to explain important philosophical passages and notions from the *De institutione musica* (the *topos* of the influence, the mechanisms of *musica humana* and of *musica mundana*, the epistemological definition of music). Grosseteste's interpretation is characterised by a will to conciliate the Pythagorean Platonic tradition of Boethius with Aristotelian natural philosophy. Yet it is

because his knowledge of Aristotle's thought is heterodox and eclectic, that is to say filtered through Arabic and Augustinian Neoplatonism, that Grosseteste succeeds in his attempt at conciliation. Grosseteste's glosses in OM provide an excellent window onto an early stage in the assimilation of Aristotle's natural philosophy, revealing much about the implications Arabic philosophy had for the philosophical renaissance just beginning in the nascent universities.

If the decade 1220-1230 seems a plausible time for the composition of the OM glosses, the question of the location, Oxford or Paris, must be left in suspension. In any case, it is doubtful that OM was the product of lectures by Grosseteste on Boethius' treatise in the Arts faculty of either Paris or Oxford. OM appears rather as a polished product by a mature master which necessitated a knowledge of geometry that many students of Arts were far from possessing.

Finally, the C glossator manifests a purely philosophical interest in Boethius' *De institutione musica*. Concentrating on the first two books of the treatise, the only ones *de forma* at the University of Paris, he expunges from his reading of the treatise all mathematical elements. The glosses in C demonstrate how the shift of philosophical paradigm that occurred with the suffusion of newly translated Greco-Arabic peripatetic texts also had an impact on the interpretation and teaching of the Boethius' *De institutione musica*. In contrast with the conciliatory approach of OM/Grosseteste, C's Aristotelianism does not grapple with persistent Platonism and Neoplatonism, but rather follows a strict Aristotelian line of thinking. Reaffirming the authority of Aristotle and of Averroes, the C glossator rejects the Platonic Pythagorean conception of an all-encompassing *musica* expounded by Boethius. *Musica mundana* and *musica humana* are thus invalidated in accordance with the precepts of Aristotelian natural philosophy. The scope of music is narrowed down to the study of consonance defined as a mixture of sounds reducible to a

certain ratio. As a result of this more Aristotelian, empirical conception of consonance, sense perception and sound are rehabilitated.

As it is clear, the focus of C's hermeneutical endeavours is almost exclusively centred on problems linked with the epistemological definition of music and to the description, in Aristotelian terms, of its *subiectum*. These were precisely the central concerns in all the sources from the Arts faculty or Paris from the examination compendia and Radulphus Brito's *Questiones mathematicales*, to the basic handbooks and the other material remains of the study of Boethius' *De institutione musica* at the institution.

The fact that the glossator of this manuscript concentrates on the first two books of the treatise, the only ones *de forma*, that were needed for the university examinations, the fact that he masters a wide range of authoritative texts from Aristotle and from his very influential 'commentator' Averroes, the fact that he adopts a 'reductionist' attitude towards the epistemological status of music by limiting its subject matter to consonances, make the C glosses the most plausible evidence of a reading of Boethius' *De institutione musica* typical of the Arts faculty of Paris. Even more, I would argue that all these features make of C the only written record of lectures on music in this institution around the beginning of the fourteenth century.

The date of the glosses in C cannot be ascertained with clear precision. But the glossator's mastery of Aristotelian philosophy suggests that he evolved at a time when the whole Aristotelian corpus was available and fully digested, that is to say, from 1240 onwards. In addition, a brief reference to Aristotle's *De motu animalium,* first translated by William Moerbeke at the beginning of the 1260s provides a *terminus post quem* for the composition of these glosses.[208] A few similarities with the works of prominent music theorists, those by Johannes de Grocheio and Jacobus Leodiensis could well demonstrate that the glosses of C had been elaborated at the turn of the fourteenth century at the time

[208] C, fol. 4v. On the date of Moerbeke's translation see F. Bossier, 'Preface', in Aristotle, *De historia animalium*, ed. F. Bossier, *Aristoteles Latinus* 17/2 (Leiden, 2000), vii-lxvi.

when both theorists were students at the Arts faculty of Paris. Indeed, the lectures on the first two books of the *De institutione musica* that Jacobus attended in Paris could well have been very similar in content to what is revealed by the set of glosses transmitted in C.

One could argue that C may be the product of the Arts faculty of Oxford and not of Paris. There is no definitive evidence irrevocably to refute such a proposition. But so far as I know, the practice of reading the first two books of Boethius' *De institutione musica* is not documented at Oxford nor has any introductory tract been uncovered to provide a hint of the content of music teaching (if music teaching there was) at this institution. In addition, the circulation of scholars between England and the Continent was common coin in the thirteenth century. Today Oxford Colleges abound in Parisian manuscripts, which were brought back at an earlier age by English scholars who had studied on the Continent.[209]

Thus, in answer to the question raised at the beginning of this chapter: 'Is there a typical interpretation of Boethius' *De institutione musica* developed as part of a formal teaching of the treatise at the Arts faculty of Paris?', the answer is yes. C represents the written record of such a teaching. In addition, the glosses in C confirm what was suggested in Chapter 1. Lectures on music at the Arts faculty of Paris were not limited to general questions about the *subiectum* of the discipline but also implied a more detailed commentary on the unique music textbook *de forma*, Boethius' *De institutione musica*, through the lens of Aristotelian logic and natural philosophy.

[209] To give but one example, the manuscript GB-Occ 243 which belonged to the English scholar William of Clara, was copied in Paris between 1266-77 and then bequeathed to the library of Corpus Christi College, Oxford at the death of William in the early fourteenth century. On this manuscript see C. Lafleur, 'La *philosophia* d'Hervé le Breton et le recueil d'introductions à la philosophie du ms. Oxford, CCC 283', *AHDLMA*, 61 (1994), 149-152.

CHAPTER 3

MUSIC IN THE PARISIAN COMMENTARIES ON ARISTOTLE

The previous two chapters made plain that the study of music and of Boethius' *De institutione musica* was not completely neglected in the thirteenth and early fourteenth centuries. It was shown that a tradition of exegesis of the treatise did emerge from the Arts faculty of Paris. From the marginalia and abbreviations of the *De institutione musica*, we can only hear very idiosyncratic voices indirectly confirming that the study of the treatise may have remained on the fringes of the university curriculum. Yet, these voices, echoing the intellectual preoccupations of their times, followed the same gradual process which gave the authority of Aristotle, and his comprehensive and beguilingly coherent system of nature, an undisputed prominence.

Officially sanctioned by the statutes of the Parisian Arts faculty, by the middle of the thirteenth century the Aristotelian corpus constituted the central if not exclusive core of the curriculum of studies for the licentiate. Thus, in order to answer the fundamental question 'what exactly was the place of music in the Arts faculty of Paris', one ought to go beyond the evidence gleaned about the teaching of music as a curricular discipline and search for musical references in the utterly daunting quantity of mostly unpublished Parisian commentaries on Aristotle. The Aristotelian corpus will provide the framework for such a systematic survey.[1] Once the musical references of the Aristotelian corpus have been identified, there will remain the question of whether or not these textual loci triggered lively debate among the masters of Arts who have commented upon them.

Before delving into the multitude of Parisian commentaries on Aristotle from the thirteenth and early fourteenth centuries, two preliminary remarks must be made. Firstly, it is useful to recall that medieval universities institutionalised two modes of commentating on

[1] An incomplete list of music-related references in the Aristotelian corpus is given by M. Haas, 'Studien zur mittelalterlichen Musiklehre I: Eine Übersicht über die Musiklehre im Kontext der Philosophie des 13. und frühen 14. Jahrhunderts', *Forum Musicologicum*, 3 (1982), 342-3.

a text: the literal exposition and the question-commentary. The literal exposition usually clings to the text in each of its minute details. Although some *expositores* sometimes insert their own reflections and *dubia* to elucidate or digress on specific doctrinal points, their aim is largely to rearticulate and paraphrase Aristotle's text and to remove any obstacle to its understanding.[2] The question-commentary starts from other premises. In general, it goes beyond the immediate paraphrase and understanding of the *littera* to tackle broader philosophical issues that may only have a loose connection with the text. If the text still constitutes the point of departure for the commentary, it is now envisioned as a repository of themes and problems for a specific discipline. Because the *questio*-commentary is not systematic but selective, it best represents the intellectual preoccupations of the commentators. Thus, the musical interests of the Parisian master of Arts are more likely to come to light in this kind of scholastic activity.

Secondly, one has to keep in mind that the systematic survey of the Parisian commentaries on Aristotle from the thirteenth and early fourteenth centuries is hindered on the one hand by the discouragingly large number of sources to sift through and on the other hand by problems which normally lurk behind any confrontation with medieval texts (problems of authorship, origin, or dating). In addition, because the preservation of medieval written documents is partly a matter of chance and circumstance, there always remains the frustration that the picture which emerges from the surviving sources will never be thoroughly representative of the actual tendencies and orientations of the individuals and institutions that produce them. Keeping these caveats in mind, the results presented here are no doubt subject to emendation. Nevertheless, enough sources have been encompassed and surveyed to sketch a valid picture of the role played by music in the Aristotelian commentaries of the Arts faculty of Paris.

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[2] For further characterisation and illustrative examples drawn from commentaries on Aristotle's *Topics* and *De interpretatione*, see O. Weijers, *Le maniement du savoir. Pratiques intellectuelles à l'époque des premières universités (13^{e}-14^{e} siècles)* (Turnhout, 1996), 103-112.

Surprisingly, musical debates in Parisian commentaries on Aristotle do not occur where expected. Substantial discussions about music found in the Aristotelian corpus do not seem to have attracted the exegetical verve and imagination of Parisian masters. Prior to the second half of the fourteenth century, the famous Book VIII of Aristotle's *Politics*, almost entirely devoted to music education and to its intrinsic ethical value for the citizens, received only minimal attention. Apart from the influential literal expositions of Albert the Great (*c.*1265-70) or Peter of Auvergne (*c.*1270-90)**,** no commentary dealing with the musical matters of Book VIII of Aristotle's *Politics* from the thirteenth and early fourteenth centuries has survived.[3] The first extant Parisian question-commentary on Aristotle's *Politics* discussing music was written by Johannes Versor *c.*1410.[4] Prior to that date, there is the French translation and original commentary of the text, written in 1374 by Nicole Oresme for Charles V.[5] This relatively poor harvest of commentaries dealing with music in the *Politics* may either be the result of the secondary status granted to the treatise in the Parisian curriculum[6] or of a sheer lack of interest in Aristotle's most technical discussion.

A similar attitude is discernible regarding the fifty musical problems contained in Book XIX of the Pseudo-Aristotelian *Problemata.*[7] Surviving evidence indicates that the lion's share of the glosses and commentaries on the treatise was elaborated not in Paris but in Italian universities, and not in the Arts faculty but in the faculty of medicine. For instance, Petrus Abanus started his most influential commentary on the *Problemata* in Paris but completed it at the beginning of the fourteenth century in Padua while he was teaching at the faculty of medicine.[8] Later in the century, it is a renowned master of medicine at the

[3] For an overview of the late medieval reception of Aristotle's *Politics* see C. Flüeler, *Rezeption und Interpretation der Aristotelischen Politica im Späten Mittelalters* (Amsterdam, 1992).
[4] Johannes Versor, *Questiones super libros Politicorum Aristotelis* (Köln, 1492), fols. 116-123.
[5] Nicole Oresme, *Le livre des Politiques*, ed. A.D. Menut (Philadelphia, 1970).
[6] See D. Luscombe, 'Commentaries on the *Politics*: Paris and Oxford (13th-15th Centuries)', in *EDFA*, 313-4.
[7] For a useful list of the Greek and Latin manuscripts containing the musical problems see A. Gallo, 'Greek Text and Latin Translations of the Aristotelian Musical Problems', in *MTIS*, 190-196.
[8] See Z. Kuksewicz, 'Les *Problemata* de Pietro d'Abano et leur 'rédaction' par Jean de Jandun', *Medioevo*, 11 (1986), 113-138.

University of Paris, Evrart de Conty, who translated and commentated on the music section of Petrus' commentary on the *Problemata*.[9]

Other important discussions of *musica* in the Aristotelian corpus concern Aristotle's refutation of the Pythagorean and Platonic beliefs in the music of the spheres and in the soul as being a harmony, respectively in *De caelo* II, 9 (290b12-291a26) and in *De anima* I, 3-4 (406b25-407a2; 407b27-409a30). We have seen that the critical attitude of the Philosopher regarding these Pythagorean and Platonic doctrines resonated in the University glosses on Boethius' *De institutione musica*. Some glossators relied on Aristotle to deprecate Boethius' acceptance of these Ancient beliefs through his tripartite division of music into *musica mundana*, *musica humana*, and *musica instrumentalis*. Yet, in their commentaries on the *De anima* or the *De caelo*, the Parisian masters of Arts are far from displaying an ebullient enthusiasm for these 'doxographical' issues. Apart from literal expositions on the *De anima*, I have found only one Parisian question-commentary which, in a very cursory and uninspired manner, broaches the problem of the constitution of the soul according to harmonic numbers.[10]

Likewise, most of the discussions regarding the music of the spheres are to be found in literal expositions of the text by Albert the Great, Thomas Aquinas, Johannes Buridan, Nicole Oresme and a few anonymous authors.[11] It seems that, in contrast with their English fellows from Oxford and Cambridge, thirteenth- and early fourteenth-century Parisian

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[9] See L. Mauro, 'La musica nei commenti ai Problemi: Pietro d'Abano e Evrart de Conty', in *La musica nel pensiero medievale*, ed. L. Mauro (Ravenna, 2001), 31-71.

[10] Anonymous, *In De anima*, ed. M. Giele (Louvain, 1971), q. 16 ('Utrum anima sit harmonia'), 54-6. Among the literal expositions see notably: Anonymus, *Lectura de Anima*, ed. R.-A. Gauthier (Grottaferrata, 1985), 112-3; Albertus Magnus, *De anima*, ed. C. Stroick, *Opera omnia* 7/1 (Münster, 1968), I, 2, 8; Thomas Aquinas, *Sententia libri De anima*, ed. Leonina, *Opera omnia* 45 (Rome, 1985), I, 9; Anonymus, *Expositio in De anima*, GB-Ob Digby 55, fols. 73vb-74ra; Johannes Buridan, *Expositio in De anima*, ed. B. Patar (Louvain, 1991), 25 and 28-9. A discouraging list of 820 manuscripts containing commentaries on the *De anima* is published by J. de Raedaemaker, 'Une ébauche de catalogue des commentaires sur le *De anima* (13^{e}-15^{e} siècles)', in *Bulletin de Philosophie médiévale*, 5 (1963), 149-183; 6 (1964), 119-134.

[11] Albert the Great, *De caelo et mundo*, ed. P. Hossfeld, *Opera omnia* V/1 (Münster, 1971), II, 3, 10; Thomas Aquinas, *Commentarium in libros Aristotelis de Caelo et Mundo*, ed. Leonina, *Opera omnia* 3 (Roma, 1886), II, 14; and a fairly uninteresting Anonymous, *Expositio in De caelo*, D-Eru 436, fols. 18vb. Among later sources, see notably Johannes Buridan, *Expositio in De caelo*, ed B. Patar (Louvain, 1997), 127-130; and Nicole Oresme's extremely original translation and commentary, *Le livre du ciel et du monde*, ed. A. Menut (Philadelphia, 1965), 468-486.

scholars were little inclined to debate Aristotle's strenuous rejection of celestial music. In their commentaries on the *De caelo*, several English masters, some anonymous and others renowned, devoted at least one question to the problem of the music of the spheres.[12] Turning to Paris, a preliminary survey has uncovered only two questions on the *De caelo* II, 9. Such a lack of interest from the Parisian masters can either be interpreted as a sign of sheer indifference to this issue or as a sign that they simply shared Aristotle's views on these matters.

In his first set of questions on the *De caelo*, Peter of Auvergne offers a succinct discussion of the problem.[13] According to Peter's main argument, there is no sound in the superlunary region because certain necessary conditions for sound generation (i.e. a violent motion and an aqueous or aerial medium) are not met.[14] An anonymous commentary composed after 1270 elaborates a more original digression which is worth a brief mention.[15] The commentator uses the Ptolemaic theory of the eccentrics to invalidate one of the arguments advanced by the Pythagoreans in favour of the music of the spheres, namely that we cannot hear the music of the spheres because it is connatural to us and we are too

[12] Adam Bocfeld, *Expositio in De caelo*, I-Rvat Urb. lat. 106, fols. 142r-143v (marginal glosses); Godfrey of Haspall, *Expositio in De caelo*, GB-Ob Digby 55, fols. 13rb-va; Walter Burley, *Expositio in De caelo*, I-Rvat Vat. lat. 2151, fols. 202ra-va; Henricus de Renham, *Expositio in De caelo*, GB-Lbl Royal 12 G II, fol. 156r (marginal glosses); Anonymus, *Quaestiones in De caelo*, GB-Cgc 509, fols. 139va-b; Anonymus, *Quaestiones in De caelo*, I-Sc L III 21, fols. 104rb-105ra; William of Bonkys, *Quaestiones in De caelo*, GB-Cgc 344, fol. 13va; Walter Burley (?), *Questiones in De caelo*, GB-Cpc 188, fols. 147ra-va; Thomas Wylton (?), *Questiones in De caelo*, D-EF CA 2° 348, fols. 134ra-rb. These questions are analysed and edited in a forthcoming article '*Figmentum Pythagoricorum*: The Music of the Spheres in Medieval Universities'.

[13] I have used the manuscript D-ERu 213, q. 35 ('Utrum corpora superiora in suo motu causent aliquem sonum'), fol. 23va. On Peter of Auvergne's successive question-commentaries on the *De caelo*, see G. Galle, 'The Authorship of One of the Sets of Questions on *De caelo* Attributed to Peter of Auvergne', *Medioevo*, 27 (2002), 191-261.

[14] 'Oppositum arguitur per Aristotelem secundo De anima: sonus causatur ex percussione corporum duorum in aere uel in aqua. Oportet enim esse percutiens [*ms.* percussiones] et percussum et inter corpora superiora non intercipitur aere uel aqua; quare ex percussione ipsorum ad invicem non potest sonus generari […] Item, sonus universaliter causatur ex percussione duorum corporum ad invicem, facientium plagam aliquam, talia oportet sibi invicem resistere. Corpora autem superiora sibi invicem non resistunt ita non plagam faciunt, cum nulla [in] ipsis reperietur contrarietas; ipsa igitur in motu suo sonum non causabunt' (Peter of Auvergne, *Questiones in De caelo*, fol. 23va).

[15] See F-Pn lat. 16634, q. 24 ('Utrum in motu stellarum causetur sonus uel melodia'), fols. 95ra-vb. Direct quotations from Thomas Aquinas' *Expositio in De caelo* composed *c.*1270 provides a secure *terminus post quem* for this commentary. The anonymous author also quotes the commentaries of Albertus Magnus and Simplicius. The sources of this commentary are analysed in greater detail in '*Figmentum Pythagoricorum*'.

accustomed to it.[16] According to the commentator, the planets revolve around the earth on eccentric spheres. Were the planets producing sound in their revolution, the intensity of this sound would vary in accordance with the constantly changing distance between the stars and the earth. Yet, as the anonymous commentator argues, it is impossible to be accustomed to the sound produced by the spheres because the latter always changes in intensity. Therefore, if we do not perceive any sounds coming from the celestial regions, it is not because our judgment is blinded by our close familiarity with this kind of melody but rather because the celestial bodies do not produce any musical melody in their revolution.[17]

When we turn to more incidental remarks about music dispersed in the Aristotelian corpus, the track for interesting comments leads at first to fairly deceptive results. The recurrent musical notions that Aristotle uses to exemplify certain doctrinal points do not seem to receive more than periphrastic comments. This is the case of the remarks on consonance scattered in numerous works of the Philosopher. In *Physics* I, 3 (194b27) and *Metaphysics* V, 2 (1013a25-8) numerical ratio is defined as the formal cause of consonance. This mathematical view of consonance is supplemented by Aristotle's affirmation in *De*

[16] This argument is reported in *De caelo*, II, 9 (290b28-30). Aristotle chooses the example of the coppersmith accustomed to the noise of the smithy. A similar argument is found in Macrobius *Commentarium in somnium Scipionis* (II, 4, 14, p. 109) who describes how the inhabitants near the cataract of the Nile do not hear the deafening sound of the waterfall because they are too accustomed to it. In his commentary on this passage, William of Conches changes this example to a windmill (*Glossae super Macrobium*, DK-Kk Gl. Kgl. S. 1910 4°, fol. 102r). It is noteworthy that the music theorist Jacobus Leodiensis quotes both the examples of Aristotle and William of Conches in his *Speculum musicae* (I, 13, p. 46).

[17] 'Stelle omnes que sunt in celo, praeter illas que sunt in polis mundi, aliquando sunt nobis magis propinque, aliquando autem minus. Quod quidem in planetis manifeste apparet. Nam quando sunt super nostrum habitabile in septentrione, propinquiores sunt capitibus nostris quam quando oblique respiciunt nostrum habitabile sicut quando sunt in meridie. Quod etiam manifestius apparet supposito quod ipsi deferantur in excentricis circulis. […] Sicut autem est de planetis ita est de stellis fixis. Est enim aliquando maior distantia ipsarum a nobis aliquando minor, que scilicet distancia, licet non causetur ab excentrico, causatur tamen ex hoc quod oblique uel recte stella respicit summitatem capitis nostri. […] Et secundum hoc stella cum est in oriente uel occidente longius distat a capitibus nostris quam quando est in linea meridiei. Ad sensum autem experimur quod quando aliquod corpus sonans propinquior est auditui, maioratur [*ms*. maioritur] et intenditur sonus. Cum ergo, ut ostensum est, omnes stelle aliquando sint nobis magis propinque, aliquando autem minus sequitur quod per comparationem ad nos sonus stellarum aliquando erit maior, aliquando minor; quare necessarium erit illud percipi a nobis. Licet enim aliquis sonus propter consuetudinem percipi non possit, eo quod propter multam assuetudinem fit insensibilis, tamen quando sonus non est uniformis, sed aliquando maior aliquando minor, non potest ex multa consuetudine imperceptibilis fieri. Et probatio: dato quod aliquis natus sub meridionalibus partibus propter consuetudinem non perciperet sonum, si tamen transferatur ad partes aquilonares, cum ibi sit maior sonus et non sit illi connutritus, deberet [fol. 96vb] ipsum percipere. […] Unde simpliciter dicendum quod celestia corpora suo motu nullum sonum causant uel musicam armonicam.' (F-Pn lat. 16634, fols. 96va-vb).

anima III, 2 (426b4-9) and *De sensu et sensato* 3 (439b20-440a6) that a consonance is a mixture of sounds blended according to a commensurate ratio. Finally, in *Topics* IV, 3 (123a33-36) and VI, 1 (139b33-140a2), Aristotle flatly affirms that consonance consists only of notes, thus denying that the term may be appropriately used to describe the soul or the motion of the heavens. The same is true for example of the *diesis* (equal to a quarter-tone in the Aristotelian tradition) that Aristotle uses on several occasions and in different contexts to refer to minima. *Diesis* is given as an example of a minimum perceptible in the *De sensu et sensato* (445b7-446a19), a minimal unit of measurement in *Metaphysics* X, 2 (1053b9-1054a18), or the simplest principle in *Posterior Analytics* I, 23 (84b37-85a1). In the *De institutione musica*, Boethius uses *diesis* to refer either to a quartertone or to a minor semitone. It is noteworthy that most medieval commentators such as Giles of Rome or Thomas Aquinas interpret *diesis* as 'minor semitone' and not as 'quartertone', probably because the latter interval (constitutive of the chromatic melodic genus of Greek music) was foreign to the diatonism of medieval Western music.[18]

In fact, only two musical remarks in the whole Aristotelian corpus captured the attention of Parisian masters. Unsurprisingly perhaps, given the specific orientation of the Arts faculty outlined in Chapter 1, they both concern the epistemological status and method of *musica*. In the *Posterior Analytics*, Aristotle distinguishes the demonstration of the 'fact' (*quia*) from the demonstration of 'the reason why' (*propter quid*) of a phenomenon.[19] For Aristotle, the knowledge of the reason why (*propter quid*) is acquired through the proximate cause whereas the knowledge of the fact (*quia*) is acquired through the effect (*per effectum*) or through a remote cause (*per causam remotam*). In other words, the middle term of a demonstration of the reason why is the proximate cause of the phenomenon, whereas in a

[18] Thomas Aquinas, *Expositio libri Posteriorum,* ed. Leonina, *Opera omnia* I/2 (Roma, 1989), I, 36, p. 67; Id., *In Metaphysicam Aristotelis*, ed. M. Cathala (Turin, 1935), X, 2, p. 644; Id., *Sententia libri De sensu et sensato*, ed. Leonina, *Opera omnia* 45/2 (Roma, 1984), I, 15, p. 32. See also Giles of Rome, *Expositio libri Posteriorum* (Venetiis, 1493), fol. 93ra.

[19] Aristotle, *Posterior Analytics*, I, 13, (78b34-79a15). For a fine interpretation of this passage, see J. Barnes, 'Aristotle's Theory of Demonstration', *Phronesis*, 14 (1969), 123-152.

demonstration of the fact the middle term is the effect or a cause set too far away from one of the two extremes. For instance one can demonstrate that a planet is near by observing that it does not twinkle (effect). But this demonstration is only of the fact, for the planet does not twinkle because it is near and not the other way round.

Usually contained within the same science, Aristotle singles out specific cases when the demonstrations of the reason why and of the fact are dispatched between two distinct sciences. Such instances occur when one science is placed under the other (*sub altero*), that is to say when the subject genus of one science falls under the subject genus of the other.[20] With such a relation of 'subalternation' (to use a term coined by thirteenth-century commentators), the demonstrations proper to the superior science can cross its own boundaries to 'descend' into the other, subalternate science. The latter will make use of the principles of the science under which it is placed to reach its proper conclusions.[21] In return, if the superior science can explain the reason why (*propter quid*) of the subalternate science's conclusions, it will never account for the fact (*quia*) 'sicut universale considerantes multotiens quedam singularium nesciunt propter id quod non intendunt'.[22] As examples of such relations between sciences, the Philosopher mentions most notably the examples of arithmetic and music (*harmonica* or *musica*), and of mathematical music (*harmonica* or *musica mathematica*) and acoustical music (*harmonica* or *musica secundum auditum*).[23] Thus, Aristotle's theory of subalternation introduces a heavy dependence of music upon arithmetic on the one hand and of mathematical music upon acoustic or 'empirical' music on the other hand. Acoustic music needs mathematical music to exist as the science. Similarly, the musician relies on arithmetic to know the reason why of musical things and to draw conclusions about them.

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[20] See Aristotle's remark: 'Una scientia est que est unius generis […] Altera autem scientia est ab altera quarumcumque principia nec ex eisdem nec altera ex alteris sunt' (*Posterior Analytics*, I, 28, 87a36-7; *Analytica Posteriora translatio Iacobi*, eds. L. Minio-Paluello and B. Dod, *AL* IV [Bruges-Paris, 1968], 60-1).
[21] *Posterior Analytics*, I, 9, 75b37-76a30. This constitutes the only instance when the principles and conclusions of a demonstration belong to different sciences.
[22] *Posterior Analytics*, I, 13, 79a5-6; *Analytica Posteriora*, 32.
[23] Aristotle also mentions the relations between geometry and astronomy, and between geometry and optics.

To complement the epistemological definition of *musica* sketched in the *Posterior analytics*, the Parisian masters focused on another brief remark of the Philosopher about the peculiar status of the discipline. In Book II of the *Physics*, Aristotle explores the differences between mathematics and natural philosophy. The mathematician and the natural philosopher both consider the same things, though in a different way. The mathematician differs from the natural philosopher in the sense that the former abstracts natural objects from motion and sensible matter whereas the latter considers them as joined with motion and matter.[24] To deny the possibility of separating mathematical objects from matter is for Aristotle tantamount to rejecting the Platonic theory of Forms. Against the Platonic hypostatisation of mathematical objects, Aristotle denies them an extra-mental reality and described them as existing solely in the intellect.[25]

Having described mathematical objects as abstract, the Philosopher introduces the cases of mathematical sciences such as optics, astronomy and music, which deal with mathematical objects *qua* natural instead of considering natural objects *qua* mathematical.[26] These sciences are suspended between mathematics and natural philosophy. Music then appears as a mathematical science inclined towards natural philosophy or, according to the medieval mistranslation of Aristotle's text, as a science *magis physica quam mathematica*.[27]

The Parisian masters found in Aristotle's remarks in the *Posterior Analytics* and the *Physics* a point of departure for in-depth discussions about the epistemological characteristics of *musica* and about its place in the classification of knowledge. The epistemological model for *musica* construed by the Parisian commentators can be seen as

[24] *Physics*, II, 2 (193b31-35). See also the description of the three branches of theoretical philosophy (natural philosophy, mathematics and metaphysics) given in the *Metaphysics*, VI, 1 (1026a14-17): 'Phisica namque circa inseparabilia quidem sed non immobilia, mathematica autem circa immobilia quidem sed inseparabilia forsan, verum quasi in materia; philosophia prima vero circa separabilia et immobilia' (*Metaphysica*, *translatio Moerbeka*, ed. G. Vuillemin-Diem, *AL* XXV/2 [Leiden, 1995], 126).
[25] See notably *De anima*, III, 4 (429b18-22) and III, 7 (431b12-6).
[26] *Physics*, II, 2 (194a15).
[27] Aristotle's text reads in fact: 'the more natural of the branches of mathematics' (*Physics* II, 2, 194a7). Such a mistranslation occurs in both the Latin translations of William of Moerbeke and the *Translatio Iacobi*. See J. Gagné, 'Du quadrivium aux scientiae mediae', in *ALPMA,* 975.

the direct offspring of their endeavour to elucidate and systematise Aristotle's theories of subalternation and of intermediate sciences. Two phases can roughly be distinguished in this process. First, an early stage, where as we shall see, Parisian masters incorporate elements from the Boethian tradition into the fabric of Aristotelian epistemology to lay the foundations of their new definition of *musica*. This first phase extends from the earliest extant commentary on the *Posterior Analytics* (*c*.1220-1230) to the momentous commentaries on the *Physics* and the *Posterior analytics* by Thomas Aquinas (*c*.1260-70). After Aquinas and up to the 1330s comes a second phase when discussions about music proliferate in Paris, particularly within the framework of commentaries on the *Physics*. Using mainly hitherto unpublished sources we shall see that the commentators will gradually reject Aquinas' definition of music and propose a more refined epistemological model for *musica* than ever before.

In Search of *Musica*: The Early Debates

Robert Grosseteste can be singled out as the author of the earliest surviving commentary on the *Posterior analytics* (written *c*.1220-30). Although it is not certain whether the commentary is indeed the product of the Parisian University, it is clear that it exerted a profound influence on subsequent generations of Parisian masters. Grosseteste's pioneering articulation of the theory of *subalternatio* leads him to reflect upon the epistemological definition of *musica* and the determination of its subject matter.[28] For him, two sciences in the relation of subalternation have subjects 'identical in a certain way'.[29] This is the case of music and arithmetic: number is common to both sciences. Yet, music

[28] A succint analysis of Grosseteste's views on *musica* as developed in the *Posterior Analytics* can be found in E. Hirtler, 'Die Musica im Übergang von der Scientia mathematica zur Scientia media', in *MuG*, 22-6. For a general overview of Grosseteste's position on subalternation, see W. R. Laird, 'Robert Grosseteste on the Subalternate Sciences', *Traditio*, 43 (1987), 147-169.

[29] Robert Grosseteste, *Commentarius in Posteriorum Analyticorum libros*, ed. P. Rossi (Florence, 1981), 138.

differs from arithmetic in that it does not deal with number *simpliciter* but in relation with something else.[30] This *numerus relatus*, subject of music, is then placed under the *numerus simpliciter* of arithmetic but it is neither substantially identical with nor totally reducible to the latter.[31] For Grosseteste, the *numerus relatus* is a composite of 'number' and 'relation'.[32] Such a composite combines a mathematical element (number) with a physical one (relation).[33] Thus, the *numerus relatus* appears as an ambivalent subject and music as a mathematical science dealing with proportioned sensory objects. Because of this ambivalence, the arithmetician will only be able to make universal (*in universali*) conclusions about music, that is to say, only insofar as number alone is concerned and independently of the physical determination *ad aliquid* which falls within the domain of expertise of the musician.[34]

As Eva Hirtler notes, where Aristotle remained elusive in the *Posterior analytics* concerning the subject matter of arithmetic and music, Grosseteste filled in the blanks by using the model of the Boethian *quadrivium*. The *numerus simpliciter* and the *numerus relatus* respectively given by Grosseteste as subjects of arithmetic and music derive in fact from Boethius' description of the *quadrivium*.[35]

Following the Boethian tradition rather than the precepts of Aristotle, Grosseteste does not limit the subject of music solely to the proportion between sounds. As he emphasizes in his glosses on Boethius' *De institutione musica*, *musica* extends to all

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[30] 'Subiectum enim arithmetice est numerus simpliciter […] cum autem cum numero coniunguntur dispositiones ad aliquid dicte […] iam constituitur subiectum musice.' (Grosseteste, *Posteriorum*, 195).
[31] 'Musica subicit numerum relatum qui est sub numero simpliciter quem subicit arithmetica' (Grosseteste, *Posteriorum*, 138).
[32] 'Non enim est subiectum musice numerus cui accidit relatio, sed compositum ex numero et relatione'(Grosseteste, *Posteriorum*, 195). On this see also Hirtler, 'Die Musica', 23.
[33] For Grosseteste, the subject of intermediate science is a 'subiectum compositum ex mathematico et naturali et demonstratur accidens mathematicum de tali subiecto composito secundum quod accidit ei propter accidens naturale quod est in subiecto.' (Robert Grosseteste, *Commentarius in VIII libros physicorum*, 37).
[34] On the importance of the middle term in such a demonstration see Grosseteste, *Posteriorum*, 147-9; see also Laird, 'Subalternate', 181-4.
[35] See Boethius, *De institutione arithmetica*, I, 1 and *De institutione musica*, II, 3. For further descriptions of the Boethian *quadrivium* see B. Munxelhaus, *Pythagoras musicus* (Bonn, 1976), 212-215; E. Hirtler, *Die Musik*, 36-43; Hentschel, *Sinnlichkeit*, 121-122.

composite beings and the *numerus relatus* concerns all proportioned beings.[36] Sounding music then appears to Grosseteste only as a species of an all-encompassing *musica*. This is made clear when, commentating on the subalternation of the *harmonica secundum auditum* to the *harmonica mathematica* described by Aristotle in the *Posterior analytics*, Grosseteste associates the former with the *numerus relatus sonorus* and the latter with the *numerus relatus*.[37]

Yet, Grosseteste's reliance on Boethius' model should not be seen as a blind acceptance of the Pythagorean paradigm.[38] For the Pythagorean and Platonic traditions, numbers actually existed as immutable essences structuring the ever-changing physical world. In positing the *numerus relatus* as a composite of 'number' and 'relation', Grosseteste establishes a clear ontological separation between number and nature. In other words, Number is no more identical to Nature. As in his glosses on Boethius' *De institutione musica* probably composed roughly at the same time as his commentary on the *Posterior Analytics*, Grosseteste manages to transpose, despite irreconcilable philosophical antagonisms, Boethius' definition of *musica* into the framework of Aristotelian epistemology.

A similar attempt to conciliate the Boethian tradition with Aristotelian philosophy permeates Robert Kilwardby's description of *musica*.[39] His description of subalternation in his *Notulae libri Posteriorum* (*c*.1240) depends heavily on Grosseteste's commentary.[40] For Kilwardby, subalternation occurs when a *differentia* is added to the subject of one science. This *differentia* must be of a different *genus* and must derive from different principles so

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[36] 'armonica dividitur secundum divisionem rerum compositarum […] In omnibus partibus armonice […] sunt numeri [ad] esse relati [...] passiones quoque que probari debent sunt proportiones quas habent partes compositionis ad invicem.' (O, fol. 1v; M, fol. 2r). See also above Chapter 2, 136-7.

[37] See Robert Grosseteste, *Posteriorum*, 194-5; and also Hirtler, 'Die Musica', 24. It is noteworthy that the main text edited by Rossi reads *harmonica secundum auditum* as in the *translatio Iacobi* of the *Posterior Analytics*, while the majority of manuscripts reads *harmonica sonora*. One manuscript from Oxford even specifies *harmonica sonora et cantorum*.

[38] This is the opinion of Hirtler, 'Die Musica', 26.

[39] Hirtler, *Die Musik*, 67.

[40] The whole passage on subalternation is transcribed from GB-Cpc 205 by Hentschel (*Sinnlichkeit*, 139-140) who shows the similarity between Kilwardby's commentary and that of Grosseteste.

that when added, it produces an ontologically distinct entity, which becomes, in turn, the subject of the subalternate science.[41] In his *De ortu scientiarum,* a classification of sciences written after his entry into the Dominican order (*c.*1250) which takes up and develops some of the views expounded in his Aristotelian commentaries, Kilwardby describes this process more concisely. The addition of a *differentia* according to the specific conditions necessary for the subalternation is seen as a *contractio* or 'specification' of the subject of the superior science.[42]

For Kilwardby, the subject of *musica* is then obtained through the 'specification' (*contractio*) of the abstract number of arithmetic (*numerus per se* or *numerus absolutus*). However, the result of such *contractio* is not the *numerus relatus* of Grosseteste and Boethius. If Kilwardby had accepted the *numerus relatus* as the subject of music in his *Notulae libri Posteriorum*, in the later *De ortu scientiarum* he considers the term too vague. There is indeed an infinity of *numeri relati*, but only five harmonic ratios are truly relevant to the musician (i.e. the first multiple and superparticular ratios founding the five primary consonances of the Pythagorean tradition).[43] The subject of music should then be redefined as *numerus harmonice relatus* or *numerus harmonicus*. This new construct extends to all 'things that are connected to one another according to harmonic ratios' (*res harmonica*

[41] 'Istae ergo sunt causae subalternationis, scilicet ut differentia adiecta sit alterius generis et non causetur ex principiis istius subiecti, cui adicitur, tamen per applicationem unius ad alterum sit [*ed.* fit] nata una natura esse.' (Robert Kilwardby, *Notulae*, quoted in Hentschel, *Sinnlichkeit*, 140).

[42] '[F]it contractio per differentiam alterius generis et naturae, ex qua tamen et eo quod contrahitur natum sit fieri unum.' (Robert Kilwardby, *De ortu scientiarum*, ed. A. Judy [London, 1976], 46). A similar statement appears in the *Communia Monacensis*, a Parisian basic handbook on logic: 'Subiectum scientie subalternate sit sub subiecto scientie subalternantis […] ita quod contrahatur per aliquam differentiam realem' (D-Mbs Clm 14522, fol. 35va); 'Subiectum superioris scientie potest contrahi aut per differentiam sibi propriam, aut per differentiam communem […] Si vero sit differentia accidentalis communis […] est una natura in illis duobus […] et appositio talis differentie facit scientiam subalternam' (Ibid., fol. 35vb). See also the *De communibus artium liberalium*, § 256, 199.

[43] 'Numerus relatus est modis infinitis. Non omnes autem isti modi concurrunt ad constituendam […] harmoniam aliarum rerum inequalium concorditer inter se aptatarum, sed tantum modi quinque cadunt in consonantiis […] non debet dici ita large quod musica sit de numero relato, sed quod sit de relato harmonice, id est de tali relato et solo harmonice componi congruit.' (Kilwardby, *De ortu*, 56).

proportione coaptatae).[44] Even though Kilwardby slightly modifies Boethius' definition of the subject of music, he nonetheless embraces the Boethian idea of an all-encompassing *musica* that deals with 'all the things connected to one another according to a *harmonica modulatio*'.[45] These include not only all material beings but also spiritual beings such as the souls and other 'separate spirits'.[46]

As Eva Hirtler remarks, the *contractio* of number does not simply imply a 'specification' but also a concretisation into sensible matter.[47] The 'harmonic relation' (*harmonica relatio*) added to the abstract number of arithmetic transforms the latter into a material and composite entity, the *numerus harmonicus*. Kilwardby also describes this new entity, subject of music, as 'a natural number' (*numerus naturalis*) or more precisely as 'a number compounded with natural things' (*numerus concretus cum rebus naturalibus*).[48] This kind of ontological realism regarding number has often been interpreted as a mark of Kilwardby's so-called Platonism.[49] Yet, contrary to the Platonists harshly castigated in the writings of Aristotle, Kilwardby never posits number as the constitutive substance of natural things. Furthermore, recent research has shown that the concept of *numerus naturalis* as an extra-mental number inhering in natural things was common coin around the middle of the thirteenth century among Oxonian and Parisian masters including such prominent figures as Albert the Great, Richard Rufus of Cornwall and Roger Bacon.[50] Thus, Kilwardby is not a 'Platonist' but rather an exponent of this mainstream realist tradition regarding number, a tradition indeed in contradiction with Aristotle who for his part denies an extra-mental

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[44] Kilwardby, *De ortu*, 46 and 53. Note that the basic handbook *Accessus Philosophorum* (*c.*1230) adopts a similar stance: 'cognita compositione et natura consonantiarum armonicarum inducimur ad cognoscendum esse universi.' (205).
[45] Kilwardby, *De ortu*, 53. Jacobus Leodiensis explains this concept of *harmonica modulatio* as a 'certain relation of proportion, concord, order, or connection' by which 'music extends to all things'. See his *Speculum musicae*, I, 2, p. 16.
[46] Kilwardby, *De ortu*, 81. In the OM glosses, Grosseteste had also posited a branch of *armonia* dealing with the separate substances or 'fixed essences', see above Chapter 2, 146.
[47] Hentschel, *Sinnlichkeit*, 130-1.
[48] See Kilwardby, *De ortu*, 57 and also 53.
[49] See Haas, 'Studien', 403-4; and Hirtler, *Die Musik*, 67.
[50] See C. Trifogli, *Oxford Physics in the Thirteenth Century (ca. 1250-1270)* (Leiden, 2000), 130-131 and 224-6.

reality to number.[51] It is perhaps against this form of ontological realism regarding the subject matter of music that the author of the *Compendium of Barcelona* felt compelled to specify that the *contractio* of number was not a concretisation but simply a specification of the properties of the arithmetician's number.[52]

In sum, like Grosseteste before him, Kilwardby achieves the *tour de force* of combining the Boethian definition of an all-pervasive *musica* with the Aristotelian epistemological model. Music continues to be the clue to an all-encompassing system of numerical relationships signifying and unifying the physical and metaphysical structures of the Creation. At the same time, it becomes an ambivalent mathematical science subalternated to arithmetic and which, at the same time, incorporates sensible matter into its subject.

Kilwardby's appraisal of music enjoyed a wide diffusion, perhaps because the *De ortu scientiarum* was included in two lists from Paris University stationers (dated from 1276 and 1304) among the works to be published by *pecia*.[53] Jacobus Leodiensis made extensive use of the treatise in his own *Speculum musicae* and the concept of *harmonica modulatio* developed by Kilwardby was pivotal in Jacobus' theory of consonance.[54] Kilwardby's definition of *musica* also took pride of place in the *Commendatio musicae* written in 1295 by two monks of Heilsbronn at the request of Bishop Henry II of Regensburg.[55]

Kilwardby's influence is also noticeable among his Parisian contemporaries. Several anonymous commentators on the *Posterior Analytics* quote in full or in part the account on

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[51] For Aristotle's view on number, see *Aristotle's Metaphysics Books M and N*, trans. and comm. J. Annas (Oxford, 1976), 26-41, 62-73, 162-187 and 207-219.

[52] *Compendium of Barcelona*, § 56, 46; and *Primo queritur utrum philosophia*, 407-8. On the notion of *contractio* in the *Compendium*, see Hirtler, *Die Musik*, 80-83.

[53] Respectively CUP, I, no. 530 and II, no. 642. For further detail on these lists and on the *pecia* system see W. Courtenay, 'Book production and libraries in fourteenth-century Paris', in *Filosofia e teologia nel Trecento*, ed. L. Bianchi (Louvain, 1994), 367-381.

[54] On the influence of Kilwardby on Jacobus Leodiensis see Haas, 'Studien', 403-5; and Hentschel, *Sinnlichkeit*, 129-131.

[55] This *commendatio* is edited by W. Hirschmann, 'Wissenschaftstheorie im pragmatischen Kontext. Die *Commendacio omnium scientiarum et specialiter musice* im Heilsbronner Musiktraktat', in *MuG*, 229-267.

subalternation found in his *Notulae libri Posteriorum*.[56] Such an influential commentator as Albert the Great even describes Kilwardby's position as 'widespread', 'fairly good and subtle'.[57] If the anonymous commentators on the *Posterior analytics* avoid discussing *musica*, Albert the Great's description of the discipline departs from Kilwardby's on one crucial aspect.

Instead of positing a *musica* that governs the harmonious ordering of the Creation as in the Boethian tradition, Albert gives several more pragmatic definitions. In accordance with Aristotle, the *doctor universalis* limits the scope of music to the acoustic realm. Albert rejects both the idea of *musica mundana* and that of *musica humana*.[58] The proper domain of expertise of the *musicus* is confined to the study of the mathematical ratios underlying the melodies uttered in singing or in musical instruments.[59] Thus, Albert variously defines *musica* as the science dealing with the 'proportio in cantu consonante', with the 'proportionalis numerus notarum taliter se habentium', with the 'proportiones numerorum in cantu et divisione [mono]chordarum', or else with the 'proportio in musicis cantibus et

[56] See notably Anonymous, *Commentum libri Posteriorum Analyticorum* (*c*.1250), GB-Cp 206, fols. 235ra-b and Anonymous, *Lectura super libros Posteriorum Analyticorum* (*c*.1260), A-KN 847, fol. 123r.

[57]'Sunt autem quidam dicentes quod tria exiguntur ad hoc quod una scientia alteri subalternetur. Et dicunt pimum esse quod subiectum subalternantis cum additione differentiae contrahentis ipsum ad naturam uel materiam determinatam ut linea visibilis se habet ad lineam[…] Secundum dicunt esse, quod id quod addit inferior et subalternata scientia, oportet quod contrahat ipsum ad rem alterius naturae et generis […] Tertium autem dicunt esse, quod id quod addit supra subiectum superioris non sit causatum uel procedens a substantia et natura subiecti superioris […] haec igitur sunt quae dicuntur communiter et satis subtiliter et bene.' (Albertus Magnus, *In libros Posteriorum Analyticorum*, ed. A. Borgnet, vol. 2 (Paris, 1891), I, 3, 6, p. 86a-b). In her succinct discussion of this passage Eva Hirtler ('Die *musica*', 31-2) fails to notice the similarities between Albert and Kilwardby. For a discussion of musical references in Albert the Great's theological works and more particularly in his commentary on the *Psalms*, see H. Hüschen, 'Albertus Magnus und seine Musikanschauung', in *Speculum musicae artis* (Munich, 1970), 205-218.

[58] 'Nonnulli sentiunt musicam aliquid conferre ad prudentiam quia per modulationem musicorum cognoscitur etiam modulata compositio naturalium ad quam compositus est mundus. […] antiqui omnes Stoici et Epicurei mirabilem harmoniam esse dixerunt in concentu motuum coelorum: quod tamen in libro de *Coelo et mundo* reprobat Aristoteles.' (Albertus Magnus, *In libros Politicorum*, ed. A. Borgnet, in *Alberti magni opera omnia*, vol. 8 [Paris, 1891], VIII, 3, p. 774a-b). Elsewhere he affirms: 'Multi sapientium hi quidem putant animam esse harmoniam hi autem habere harmoniam. Et hoc notandum est quod hanc opinionem Aristoteles improbat in libro de anima ubi proponit quod anima nec est harmonia nec harmoniam consequens. Sed ibi probat quod non est harmonia corporis quia si talis esset harmonia esset commixta ex elementis quod falsum est.' (*In libros Politicorum*, VIII, 4, p. 787a).

[59] In his commentary on the *Topics*, Albert affirms that: 'omnis enim consonantia proprie in sonis est: propter quod etiam consonantia a sonis nomen accepit.' (*In libros Topicorum*, ed. A. Borgnet, in *Alberti magni opera omnia*, vol. 23 [Paris, 1895], VI, 1, 1, p. 367b).

instrumentis (monochordo scilicet, vigella et lyra et huiusmodi)'.[60] On two occasions, Albert even incorporates time in his definitions of *musica*: '[musica est] de numero relato ad morulas et modulos sonorum' or again 'musica est de temporibus et tonis numeratis in sonis'.[61] However, the *doctor universalis* does not seem to make a reference here to contemporary musical practices, which focused mainly on measuring and notating musical time.[62] The inclusion of time in the definition of music must be linked to Albert's close reading of Avicenna's physical treatise, the *Liber de Sufficentia*. Indeed, in approaching the problem of the intermediate sciences, Avicenna asserted that 'musice subiectum sunt thoni et tempora et habet principia a scientia naturalium et scientia numerorum'.[63] The objection raised in the *Compendium of Barcelona* against the inclusion of time in the musician's realm might then be interpreted as an attack against those who like Albert adopted Avicenna's definition of *musica*.[64]

In a way, Albert's pupil, Thomas Aquinas, carries further the Aristotelian definition of *musica* of his master. Where Kilwardby and Grosseteste had defined the *numerus relatus sonorus* as a species of a more general subject genus, the *numerus relatus*, Aquinas considers the former as the true subject genus of *musica*. Like Albert, he confines the subject of music to the *numerus sonorus* or to the *consonantia in vocibus humanis et sonis inanimatorum corporum*.[65] This does not, however, imply a total rejection of the Neoplatonic idea of the harmony of the world, but simply a limitation of the musician's expertise to the realm of sounds.[66]

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[60] Albertus Magnus, *In libros Posteriorum Analyticorum*, I, 2, 16, p. 61a; I, 2, 17, p. 66b; and I, 3, 7, p. 85a.
[61] Respectively *In libros Posteriorum Analyticorum*, I, 3, 7, p. 87a; Albertus Magnus, *Physica*, ed. P. Hossfeld, *Opera omnia* 4/1 (Aschendorff, 1987), II, 1, 9, p. 90.
[62] This is Hentschel's opinion (*Sinnlichkeit*, 163).
[63] Avicenna, *De sufficentia*, (Papiae, 1490), cap. 8, fol. 18ra.
[64] Anonymous, *Compendium of Barcelona*, § 57, 46; and also Anonymous, *Primo queritur utrum philosophia*, §85, 408. It is noteworthy that both texts use like Avicenna the unusual word '*tonus*'.
[65] Thomas Aquinas, *Expositio libri Posteriorum*, I, 25, p. 57 and I, 41, p. 155. Several introductory tracts of the Arts faculty from *c.*1250 also posit the *numerus sonorus* as the subject matter of music. See Hentschel, *Sinnlichkeit*, 141.
[66] For instance in his commentary on Pseudo-Denys' *De divinis nominibus*, Aquinas describes the similarities between the sounding harmonies and the harmonious relations between things: 'proportiones autem in sonis vocantur harmoniae et, per quamdam similitudinem, proportiones convenientes quarumcumque rerum

The *numerus sonorus* is, according to Aquinas, obtained through the 'application' of 'the formal number that the arithmetician studies to a matter, i.e. sounds'.[67] There are two salient aspects in this definition. Firstly, the subject of music appears as a composite entity with a mathematical 'form' and a physical 'matter'. By placing number as the 'form' of musical objects, Aquinas' description adheres to Aristotle's explanation of number as the 'formal cause' of musical consonance.[68] Yet, the Dominican master is not innovative here. The definition of the subject of music in terms of a relation of form to matter was indeed already in circulation at the Arts faculty of Paris *c.*1240, as an anonymous Parisian commentator on the *Posterior Analytics* makes explicit: 'Arismetica enim est de numero, armonica uel musica est de numero sonoro scientie. Non enim sonat numerus sed est de sono numerato [mercato *ms.*]; unde numerus forma est, sonus autem materia et subiectum.'[69] In addition, the concept of *numerus sonorus* was accepted as early as 1230, as the subject of music in several introductory tracts from the Arts faculty of Paris.[70]

Secondly, the notion of 'application' also has a clear ontological implication. It helps avoid the realistic overtones associated with the notion of *contractio* employed by Kilwardby and Albert. In the case of music and arithmetic, to posit a *contractio* of number into sensible matter suggests that this number exists as an extra-mental reality, whereas the application of a 'formal number' as described by Aquinas, hints that a number exists only in the intellect.[71] Thus, the *numerus sonorus* must not only be envisioned as an

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harmoniae dicuntur' (Thomas Aquinas, *Super de divinis nominibus*, IV, 6, eds. C. Pera and *al.* [Turin, 1950], 319). For an analysis of this passage see Hentschel, *Sinnlichkeit*, 224-226.

[67] 'musica applicat numerum formalem (quem considerat arithmeticus) ad materiam, id est ad sonos.' (*Expositio libri Posteriorum*, I, 25, p. 91). See also Thomas Aquinas, *Commentaria in libros Physicorum*, ed. Leonina, *Opera omnia* 2 (Roma, 1884), II, 3, p. 63.

[68] See *Physics* II, 3 (194b27); *Metaphysics* V, 2 (1013a25-8). Commenting on these passages, Aquinas describes numerical ratios as the form of consonances and sound as the matter. See Thomas Aquinas, *Commentaria in libros Physicorum*, II, 5, p. 69; and Id., *In Metaphysicam Aristotelis*, V, 2, p. 255.

[69] Anonymus, *Commentum libri Posteriorum Analyticorum*, GB-Ob Canon Misc. 403, fol. 76rb.

[70] *Accessus Philosophorum*, 203; *Philosophica Disciplina*, 267; *De communibus artium liberalium*, 199; Arnulf of Provence, *De divisione scientiarum*, 327; *Communia visitatio*, fol. 79ra.

[71] Aquinas' anti-realist position on number is perhaps most openly expressed in his commentary on the *Physics*, in the context of his discussion of the ontological status of time: 'Sed nihil aliud natum est numerare quam anima, et inter partes animae non alia quam intellectus […] Si igitur non est anima intellectiva, non est

epistemologically ambivalent subject but also as an ontologically composite entity existing partly inside and partly outside the soul. This simply signifies that the numerical structure of musical phenomena does not exist in nature as an underlying reality but is actualised by the intellective power of the soul.

The notion of the 'application' of a mathematical form to a sensible matter helps Aquinas to articulate his theory of subalternation.[72] When one science is subalternated to another, the inferior science applies the mathematical subject and principles of the superior science to sensible matter.[73] To characterise the epistemological characteristics of these subalternate disciplines, which like music, astronomy or optics apply mathematical subjects and principles to sensible matter, Aquinas uses the term *scientie medie*.[74] It is worth mentioning that contrary to what has been assumed, the Dominican master does not construe the notion of *scientia media* in an ambient theoretical vacuum.[75] As Gagné observes, the expressions *in dispositione media* and *quasi medium inter naturalem et mathematicum* used by Averroes in his commentary on this passage might be the source of the expression *scientia media*.[76] In fact, already in the early 1240s, the Oxonian master Adam Bocfeld coined the expression *scientie medie* to describe those sciences presented by Aristotle in his *Physics* as 'more physical than mathematical'.[77] If Aquinas was not the

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numerus.' (*Commentaria in libros Physicorum*, IV, 23, p. 223). This position depends heavily upon Averroes. See A. Maier, *Metaphysische Hintergründe der Spätscholastischen Naturphilosophie*, (Roma, 1955), 68-70.

[72] 'Subiectum inferioris scientiae non est species subiecti superioris scientiae; sed subiectum inferioris scientiae comparatur ad subiectum superioris sicut materiale ad formale. Et hoc modo accipit hic unam scientiam esse sub altera […] per applicationem formalis ad materiale.' (*Expositio libri posteriorum* I, 25, p. 91). For an overview of Thomas' theory of subalternation, see C. A. Ribeiro do Nascimento, 'Le statut épistémologique des sciences intermédiaires selon Saint-Thomas d'Aquin', *Cahiers d'études médiévales*, 2 (1974), 47-65.

[73] See Ribeiro do Nascimento, 'Le statut', 52-4.

[74] 'Dicuntur autem scientiae mediae quae accipiunt principia abstracta a scientiis pure mathematicis et applicant ad materiam sensibilem' (*Commentaria in libros Physicorum*, II, 3, p. 63). See also Thomas Aquinas, *Expositio libri Posteriorum*, I, 41, p. 152; and Id., *Super Boetium De Trinitate*, ed. Leonina, *Opera omnia* 50 (Rome, 1992), V, 3, ad 6, p. 151. The most comprehensive and extensive analysis of Aquinas' definition of the *scientie medie* remains Ribeiro do Nascimento, 'Le statut', *passim*. See also J. Gagné 'Scientiae mediae', 981-2; and with a particular attention to music Hirtler, 'Die *musica* ', 35-7; Hentschel, *Sinnlichkeit*, 131-133.

[75] See notably Gagné 'Scientiae mediae', 982; Hentschel, *Sinnlichkeit*, 131.

[76] Gagné, 'Scientiae mediae', 977.

[77] Commenting this passage, Bocfeld describes music, optics and astrology as 'scientie que sunt medie inter mathematicam simpliciter et scientiam naturalem simpliciter' (Adam Bocfeld, *Expositio super Physicam*, F-Pn

inventor of the term *scientie medie* as was previously thought, the undeniable originality of the latter lies in his use of the *scientie medie* to qualify a particular case of subalternation.[78]

According to Aquinas, the *scientie medie* are on the one hand distinct from the purely mathematical sciences (arithmetic and geometry) and on the other hand from the purely physical ones. The practitioners of the *scientie medie* differ from the natural philosopher because they consider their objects not *qua* sensible but *qua* abstract. At the same time, their approach is different from that of the pure mathematicians. In applying the abstract principles and subjects of the purely mathematical sciences to a specific matter, the practitioners of the *scientie medie* nevertheless take sensible matter into consideration in their conclusions.[79] For instance, music as a *scientia media* differs from arithmetic because the musician integrates sounds into his conclusions.[80] However, *musica* is also distinct from natural philosophy for sounds are not envisioned as sensible entities but as numerical ratios.[81]

Faced with the ambiguous epistemological status of the *scientie medie* in general and of music in particular, there remains the problem of determining whether these intermediate sciences are more mathematical, more physical, or perfectly in between. Aquinas' view on this matter is perplexingly contradictory. In his commentary on the *Posterior Analytics* and in other texts, he affirms that the mathematical character of the *scientie medie* logically derives from their subalternation to the purely mathematical sciences.[82] In the commentary on the *Physics*, Aquinas cleaves to Aristotle's amphibological statement and asserts, in

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lat 6319, fol. 9r). The term *scientia media* is also reported in an anonymous English commentary from Bocfeld's school (*Notulae libri Physicorum*, GB-Ob lat. misc. C 69, fol. 10ra). As Gagné observes, the expressions *in dispositione media* and *quasi medium inter naturalem et mathematicum* used by Averroes in his commentary on this passage might be the source for the expression *scientia media*.

[78] See Ribeiro do Nascimento, 'Le statut', 36 and 57.

[79] Thomas Aquinas, *Commentaria in libros Physicorum*, II, 3, p. 63; Id., *Super Boetium De Trinitate*, V, 3 ad 6, p. 151; Ribeiro do Nascimento, 'Le statut', 75-6.

[80] 'Musica applicat ad sonos ea quae arithmeticus considerat circa proportiones numerorum.' (Thomas Aquinas, *Commentaria in libros Physicorum*, II, 3, p. 63).

[81] 'sicut musica considerat sonos, non in quantum sunt soni, sed in quantum sunt secundum numeros proportionabiles.' (Thomas Aquinas, *Super Boetium De Trinitate*, V, 3, ad 6, p. 151).

[82] See notably *Super Boetium De trinitate*, V, 3, ad 6, p. 151. For other references to this position see Ribeiro do Nascimiento, 'Le statut', 77-81.

contrast, that the *scientie medie* are 'more physical than mathematical' on the grounds that they elaborate demonstrations about sensible things.[83] Because Adam Bocfeld interprets this passage in a similar way, it is highly probable that Aquinas followed the guidance of the English master on this particular issue.[84]

The efforts to elucidate Aristotle's comments on music in the *Physics* and the *Posterior analytics* led to the construction and articulation of a new, Aristotelian, subject and method for *musica*. Because Aristotle remained elusive concerning certain aspects, the first commentators found all complementary information in the most authoritative medieval source for speculative music, Boethius' *De institutione musica*. Scholars like Grosseteste and Kilwardby reconciled the Boethian *musica* with the epistemological requirements of the Aristotelian theory of subalternation. Because such conciliation did not go without obvious contradictions, other commentators like Albert opted for a limitation of music to the realm of sound that was more in accordance with Aristotle's views. This strict Aristotelian line posited a *numerus sonorus*, formally determined by number and materially by sound, as the subject of music. Thomas Aquinas matched this new composite subject with an adequate, similarly ambivalent method with which the musician applied the principles of arithmetic to sensible sound. With such epistemological characteristics, music was thus defined not only as a subalternate science but also as a *scientia media*, suspended between the two poles of mathematics and natural philosophy. It is precisely Aquinas' conception of the *scientie medie*, influenced by the thought of the English master Adam Bocfeld, that, as we shall now see, fuelled subsequent discussions over the epistemological status of music at the Arts faculty of Paris.

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[83] 'Huiusmodi autem scientiae, licet sint mediae inter scientiam naturalem et mathematicam […] sunt magis naturales quam mathematicae, quia unumquodque denominatur et speciem habet a termino: unde, quia harum scientiarum consideratio terminatur ad materiam naturalem, licet per principia mathematica procedant, magis sunt naturales quam mathematicae.' (Thomas Aquinas, *Commentaria in libros Physicorum*, II, 3, p. 63).

[84] According to Adam Bocfeld: 'Scientia perspectiva, astrologia, musica quodammodo considerant materiam et tangunt ipsam in suis diffinitionibus; ergo multofortius scientia simplex naturalis in diffinitionibus formarum naturalium materiam tangit.' (*Expositio in libris Physicorum*, fol. 9r). See also the similar opinion in the anonymous *Notulae libri Physicorum*, GB-Ob lat. misc. C 69, fol. 10ra.

Epistemological *subtilitas*: is music more physical than mathematical?

After Aquinas, in the Parisian commentaries on the *Posterior Analytics*, music apparently ceases to be one of the privileged examples used to explain the subalternation of the sciences.[85] Yet, the exemplarity of music as a *scientia media* did not lose its appeal. Parisian masters debated with much enthusiasm about *musica* as part of the broader question on the epistemological status of the *scientie medie*. The Gordian knot at the heart of the discussion lay in the exegesis of Aristotle's famous amphibology in *Physics* II, 2 which described the *scientie medie* as 'more physical than mathematical'.

Are music and the other *scientie medie* (chiefly astronomy) more mathematical or more natural sciences? During the period *c*.1270-1320, this question was widely circulated at the Arts faculty of Paris. Sometimes the problem of the *scientie medie* was tackled under the form of a *sophisma*, that is, a logically awkward and ambiguous statement to be discussed.[86] To include discussions in the form of *sophismata* in *Physics* commentaries was apparently common practice at the Arts faculty of Paris around 1300.[87] While no such *sophisma* have survived, we have the testimony of Johannes Jandun *c*.1310: 'Utrum iste scientie medie sint magis naturales quam mathematice videtur in sophisma'.[88]

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[85] This is notably the case in the following commentaries on the *Posterior Analytics* composed after 1270: Jacobus of Douai, *Questiones super libros Posteriorum* (*c*.1270) A-KN 274, fol. 156rb; Peter of Auvergne, *Questiones super libros Posteriorum* (*c*.1280), I-Fl S. Croce Pluteus XII sin. 3, fols. 33va-b; Ps-Boethius of Dacia, *Questiones libri Posteriorum*, D-Eru 213, fol. 91rb; Peter of St Amour, *Questiones super libros Posteriorum* (1281), D-LEu 1359, fols. 15va-b; Gerardus of Nogent, *Questiones super libros Posteriorum* (*c*.1290), F-Pn lat. 16170, fols. 121vb-122ra; Radulphus Brito, *Questiones super libros Posteriorum*, F-Pn lat 14705, fol. 88va; Henricus of Brussels (*c*.1310), *Questiones super libros Posteriorum*, A-Wn 2302, fol. 31rb. Most of these commentaries are transmitted in several copies. However, there remains around a dozen anonymous commentaries of uncertain date and origin that I have not been able to access.

[86] On *sophismata*, see the excellent description by Weijers, *La disputatio*, 67-91.

[87] See S. Ebbesen, 'Sophismata and Physics Commentaries', *Cahiers de l'Institut du Moyen Age Grec et Latin*, 64 (1994), 166-7.

[88] Johannes de Jandun, *Commentum super Physicam* (Venetiis, 1496), fol. 38vb.

The problem of the *scientie medie* also appeared in sets of *Questiones mathematicales* composed by Parisian masters *c*.1300. Besides the mathematical questions by Radulphus Brito (prior to 1299) analysed in Chapter 1, two other sets of *Questiones mathematicales* have been brought to light: an anonymous one (*c*.1320) now preserved in the manuscript GB-Lbl Harley 1 (henceforth Harley Anonymous) and a compilation of mathematical questions (*c*.1315) by Hugh of Utrecht, Simon of Padua and Sebastianus de Aragonia transmitted in the manuscript D-Mbs Clm. 14246 (henceforth *Compilatio Monacensis*).[89] Finally and more prominently, almost all the extant Parisian commentaries on the *Physics* from the late thirteenth and early fourteenth centuries devote at least one question to the *scientie medie*.[90] The ubiquity of the problem regarding the epistemological status of the *scientie medie* in the Parisian University sources stands out even more when measured against its quasi-total absence from English and Italian commentaries on the *Physics*.[91]

By *c*.1320, as Harley Anonymous tells us, the problem of the *scientie medie* had generated 'many famous conflicting opinions'.[92] The Parisian master Johannes Buridan also saw in the issue a heated point of contention between the *doctores*.[93] As Marsilius of Inghen clarifies, the controversy started from a divergence of opinion between Thomas Aquinas and

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[89] For the question on the *scientie medie* see Radulphus Brito, *Questiones mathematicales* (*c*.1300), q. 8, ed. Hentschel, in *Sinnlichkeit*, 288-92; *Compilatio Monacensis*, q. 13, ed. G. Dell'Anna, in *Theorica Mathematica et geometrica medievalia* (Lecce, 1992), 100-103; Harley Anonymous, *Questiones mathematicales* (*c*.1320), q. 5, ed. Hentschel, in *Sinnlichkeit*, 308-313. On the interrelations between these three sets of *questiones mathematicales* see F. Hentschel and M. Pickavé, '*Questiones mathematicales*. Eine Textgattung der Pariser Artistenfakultät im frühen 14 Jahrhundert', in *Miscellanea mediaevalia*, 28, ed. J. Aertsen and A. Speer (Berlin, 2000), 618-634.

[90] References to particular commentaries will come in the course of this section. For a very useful overview of Parisian commentaries on the *Physics* posterior to 1270, see the invaluable studies by S. Donati, 'Per lo studio dei Commenti alla *Fisica* nel XIII secolo. I: Commenti di probabile origine inglese degli anni 1250-1270ca.', *Documenti e Studi sulla Tradizione Filosofica Medioevale*, II/2 (1991), 366-8 and 373-4; Ead., 'Commenti Parigini alla Fisica degli anni 1270-1300', in *Miscellanea Mediaevalia*, 23, ed. A. Speer (Berlin-New-York, 1995), 136-256.

[91] I have found only one Italian commentary on the *Physics* written in Padua *c*.1350 dealing with the *scientie medie*: Joachim de Parma, *Questiones super Physicam*, I-Rvat, vat. lat. 3012, fol. 235ra.

[92] Harley Anonymous, *Questiones mathematicales*, 310.

[93] 'Sed tunc est dubitatio inter doctores utrum ille magis debeant dici scientie naturales quam mathematice uel magis mathematice quam naturales.' (Johannes Buridan, *Questiones super octo phisicorum*, [Parisiis, 1509], fol. 34va).

Averroes in the interpretation of Aristotle's amphibology.[94] Averroes claims that Aristotle's intention is not to posit the *scientie medie* as natural sciences but rather to affirm that their method is closer (*propinquior*) to that of natural philosophy.[95] For medieval commentators this is tantamount to affirming that the *scientie medie* are closer to natural philosophy than the purely mathematical sciences such as arithmetic and geometry. As Radulphus Brito puts it in his *Questiones super Physicam* (*c*.1290): 'Quod Philosophus dicit quod ille sunt magis naturales quam mathematice sic debet exponi: sunt magis naturales quam mathematice, id est quam geometria et arismetica, que sunt pure et simpliciter mathematice.'[96] Thus, according to this opinion, music is indubitably more physical than arithmetic.[97]

Thomas Aquinas, as we have seen, proposed a different interpretation of this passage of the *Physics*. For him, a science is named after the nature of its conclusions. The *scientie medie* make conclusions about sensible matter even though they proceed through mathematical principles. Therefore they are more natural than physical.[98] According to Giles of Rome, Aquinas' view simply implies that the intermediate sciences are *per se* closer to natural philosophy than to mathematics.[99]

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[94] 'Secundo incidentaliter de quo est controversia inter Beatum Thomam et Commentatorem, utrum sciencie medie, scilicet musica et astronomia, sint magis naturales quam mathematice' (Marsilius of Inghen, *Questiones Super Physicam* [*c*.1360], [Venetiis, 1516], fol. 7ra).

[95] 'Sed non debes intelligere quod consideratio eius est consideratio naturalis, sed intendebat quod consideratio eius est propinquior considerationi naturali' (Averroes, *De physico auditu*, [Venetiis, 1562], fol. 55vL).

[96] Radulphus Brito, *Questiones super Physicam*, I-Fn Conv. Soppr. E. 1. 252, fol. 20ra. Radulphus' commentary on the *Physics* exists in two other different versions, I-Rvat vat. lat. 3061, fols. 63ra-126va and F-Pn lat. 16160, fols. 3ra-79rb. They both avoid the problem of the *scientie medie*. For views similar to Radulphus', see Kilwardby, *De ortu scientiarum*, 81; Giles of Rome, *In Physicam* (Venetiis, 1502), II, 3, fol. 31vb; Harley Anonymous, *Questiones mathematicales*, 312.

[97] As Giles of Rome puts it: 'Sic etiam cum armonica sive musica sit media inter arismeticam et naturalem, ipsa erit magis phisica quam arismetica.' (*In physicam*, fol. 31vb).

[98] 'Dicuntur hic a philosopho esse magis naturales quam mathematicae [sc. scientie medie], quia unumquodque denominatur et speciem habet a termino: unde, quia harum scientiarum consideratio terminatur ad materiam naturalem, licet per principia mathematica procedant, magis sunt naturales quam mathematicae.' (Thomas Aquinas, *Commentaria super Physicam*, II, 3, p. 64).

[99] '[P]otest intelligi has scientias medias magis esse phisicas quam mathematicas quia cum scientie medie sint inter utraque plus appropinquant uni extremo quam alii ut plus appropinquant phisice quam mathematice.' (Giles of Rome, *In Physicam*, fol. 31vb).

If Giles of Rome does not corroborate this assertion,[100] several Parisian commentators embrace Aquinas' view. A significant instance of such a doctrinal adherence to the Dominican master's thought occurs in an anonymous *Questiones super Physicam*, written around *c*.1270-5:

> Illa scientia que considerat de naturalibus et sensibilibus secundum quod huiusmodi est naturalis, sic ille sunt huiusmodi ut perspectiva numerum visibilem et musica numerum relatum ad sonum et astrologia figuras corporum superiorum […] Dicendum quod partim sunt naturales, partim mathematice et magis naturales quam mathematice, cuius ratio est quia iste scientie considerant generaliter res naturales […] ideo sunt magis naturales [*ms*. naturalia]. Sed dicuntur mathematice quia utuntur principiis mathematicis ad declarandum conclusiones naturales quia eandem conclusionem ostendit astrologus et naturalis uel musicus et naturalis.[101]

Similar positions reverberate in several other hitherto unpublished Parisian commentaries on the *Physics* that can be dated from the decade following the death of Aquinas in 1273.[102] Music is thus generally defined as a science, partly mathematical and partly physical (*partim naturalis et partim mathematica*), but nevertheless more physical than mathematical because of the nature of its conclusions.

From the 1290s onwards there is a change in the attitude among Parisian masters regarding the epistemological status of music and the *scientie medie*. Such prominent figures as Radulphus Brito, Hugh of Utrecht and Bartholomeus of Bruges accuse the *expositor antiquus*, i.e. Thomas Aquinas, of promoting erroneous views about the *scientie*

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[100] 'Haec autem intellectus utrum sit verus et si non est verus simpliciter et per omnem modum utrum secundum aliquem modum habeat veritatem forte alibi habebit locum.' (Ibid.)

[101] Anonymous, *Questiones super Physicam*, I-Rvat vat. lat. 6758, fol. 56vb.

[102] See for instance an anonymous commentary from the end of the thirteenth century: '[Scientie medie] sunt partim naturales et partim mathematice et sunt medie inter istas set magis naturales sunt quia finaliter considerant res naturales.' (Anonymous, *Questiones super Physicam* (2), D-EF CA 4° 149, fol. 85vb). In another set of *questiones*: 'Licet autem iste scientie dicantur et sint medie inter puras mathematicas et naturales quia tamen *unumquodque speciem et denominationem habet a termino*, consideratioque ipsarum *terminatur ad materiam naturalem*, ideo secundum Philosophum in eodem libro, *magis sunt naturales quam mathematice*.' (Anonymous, *Questiones super Physicam*, F-Pn lat 16634, fol. 15ra; direct quotations from Aquinas' commentary on the *Physics* are italicized). See also Anonymous, *Questiones super Physicam* (*c*.1270-80), I-Pca 380, fols. 70ra-91va, here fol. 72va; and finally, Anonymous, *Questiones in Metaphysicam* (*c*.1280), F-Pm 3490, fols. 1ra-57vb, here fol. 18vb.

medie.[103] These authors voice the then dominant opinion in the Arts faculty. All the extant Parisian commentaries on the *Physics* and the *Questiones mathematicales* now expressly reject Aquinas' views.[104] Their reaffirmation of the mathematical nature of music is essentially founded on two main arguments which perfectly capture the great subtlety with which these texts handle the problem of the definition of *musica*: 1) an argument *ab auctoritate*; and 2) an epistemological argument.

Ab auctoritate

For several commentators, music is a mathematical science because it had always been classified as such by mathematicians. As Bartholomeus of Bruges remarks, it is absurd to think that so many mathematicians erroneously placed music among the mathematical sciences and that no natural philosopher includes it in his domain of expertise.[105] An anonymous commentary on the *Physics*, probably written around *c*.1300 (hereafter F), provides similar arguments *ab auctoritate*. The anonymous commentator also adds that had music and astronomy been natural sciences, Aristotle would have devoted more attention to these sciences in his comprehensive system of nature.[106] Finally, according to Radulphus

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[103] 'Dico […] quod magis sunt mathematice quam naturales licet aliqui expositores dicant contrarium.' (Radulphus Brito, *Questiones super Physicam*, fol. 19vb). Hugo of Utrecht's reprobation of Aquinas is reported in the *Compilatio Monacensis* (102). According to Bartholomeus of Bruges: '[opinio] quam expositor antiquus tenet in secundo Phisicorum quod sint magis naturales […] opinionem non credo esse veram.' (*Questiones super Physicam*, I-Rvat vat. lat. 845, fol. 68va). [Note that this manuscript is a *reportatio* made under the supervision of Bartholomeus himself. As the colophon tells us: 'Incipiunt questiones supra librum Phisicorum Aristotelis a venerabili viro magistro Bartholomeo de Brugis disputate Parisius in vico Straminum recollecte sub eo per Franciscum de Cinone Castellis' (fol. 37ra). For further information concerning the author, the date and the five other manuscript copies of this commentary see J. M. Thijssen, 'The Commentary on the Physics of Bartholomew of Bruges (d.1356): an Inventory of the Manuscripts', *Manuscripta*, 31 (1987), 89-101].

[104] See for instance Radulphus Brito: 'Verumptamen ego sustineo opinionem Commentatoris et dico quod musica […] et astrologia […] sunt magis mathematicae quam naturales' (*Questiones mathematicales*, 289).

[105] 'Et hoc ego possum declarare ex pluribus. Primo quod iste scientie sunt mathematice magis, quia ab omnibus mathematicis computantur inter mathematicas et est locus ab auctoritate. […] valde absurdum esset dicere quod omnes pe[c]cavissent imponendo eas inter mathematicas. Nullus actorum mathematicorum est qui non posuisset eas esse mathematicas, nullus etiam naturalium computavit eas inter naturales.' (Bartholomeus of Bruges, *Questiones super Physicam*, fol. 68vb).

[106] 'Primo sic quia ille scientie que connumerantur inter mathematicas debent dici mathematice; sed musica et astrologia sunt huiusmodi, sicut patet per omnes auctores determinantes de eis ; ergo etc. Item, si huiusmodi scientie essent naturales et non mathematice, tunc Philosophus fuisset insufficiens in tradendo scientiam

Brito, music and astronomy are necessarily mathematical because they are and have always been part of the *quadrivium*.[107]

For some commentators, it is not sufficient to affirm that music is placed among the mathematical sciences. They insist on greater precision as to which part of music one is alluding to.[108] The canonical Boethian tripartite division of music into *musica mundana*, *musica humana* and *musica instrumentalis* provides here a useful starting point even if each author readjusts it in conformity with the basic tenets of Aristotelian natural philosophy. F proposes the most extensive and by far the most interesting classification of music. Hence this text will constitute the focus of our analysis.

Following Aristotle's admonitions against those who describe the soul as a harmony (*De anima* I, 3 and 4), the anonymous author of F deliberately restricts the scope of *musica humana* to the study of the harmonious disposition of the human body.[109] In this respect, he differs from Radulphus Brito, the Harley Anonymous or the *Compilatio Monacensis* who equate *musica humana* to vocal music.[110]

Now, when it comes to the definition of *musica mundana*, the anonymous commentator is even more cautious:

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naturalem; sed hoc est inconveniens.' (Anonymous, *Questiones super Physicam*, I-Fn Conv. Soppr. E. 1. 252, fol. 252va [hereafter F]). The commentary only runs from Books II to Book IV, 9. See also the arguments *ab auctoritate* adduced by the Harley Anonymous (*Questiones mathematicales*, 308) and in the *Compilatio Monacensis* (100).

[107] 'Oppositum arguitur quod sint magis mathematice [sc. musica et astronomia] quia tunc non haberemus .4. mathematicas sicut in quadruvio sed duas tantum quia ille due iam non essent mathematice sed naturales.' (Radulphus Brito, *Questiones super Physicam*, fol. 19vb). It is noteworthy that for several commentators there are many more mathematical sciences than the four 'famous' ones described by Boethius. See for instance Bartholomeus of Bruges: 'Boecius et alii loquitur de [scientiis] specialibus et famosis et tales sunt 4 tantum quia multe tunc non erant per se eis note.' (*Questiones super Physicam*, II, q. 6, fol. 68rb). See also Harley Anonymous, *Questiones mathematicales*, q. 4, 305-6; and *Compilatio Monacensis*, q. 10, 91-3.

[108] The Harley Anonymous underscores the importance of such a preliminary division of music: 'Cum dicatur musicam […] esse magis mathematicam quam naturalem, praeintelligendum tamen est de qua musica […] intelligatur'. (Harley Anonymous, *Questiones mathematicales*, 310). One of the authors quoted in the *Compilatio Monacensis* (101) justifies his classification of music by stating that: 'non distinguere multiplex causat errorem.'

[109] 'Musica vero humana non est nisi colligentia totius corporis secundum proportiones musicales' (F, fol. 252vb).

[110] See Radulphus Brito, *Questiones mathematicales*, 296; Harley Anonymous, *Questiones mathematicales*, 310; *Compilatio Monacensis*, 101. See also in the thirteenth century: *Compendium of Barcelona*, § 50, 44; *Primo queritur utrum philosophia*, 495; *Philosophica disciplina*, 268.

> Musica mundana non est aliud nisi quedam consonantia et proportio, quequidem consonantia reperitur tam in superioribus quam in inferioribus. Unde in corporibus celestibus est quedam consonantia, non quod illa consonantia resultet ex vocibus sed resultat ex motibus. Ista tamen consonantia non est nobis sensibilis et pertinet ad naturalem considerare circa eam.[111]

Constrained by the Aristotelian invalidation of the music of the spheres, the commentator rejects the idea that celestial bodies might produce harmonious sounds in their revolution. Yet, for him, the category of *musica mundana* can be preserved and redefined to be fully compatible with Aristotelian cosmology. The harmonious motions of the celestial bodies can indeed be conceived as an intelligible consonance. Apart from Radulphus Brito and the glossator of Boethius' *De institutione musica* in GB-Occ 118,[112] the greatest bulk of Parisian masters and music theorists of the thirteenth and fourteenth centuries follow similar hermeneutic contortions to maintain at all costs the category of *musica mundana*.[113] However the author of F is aware that the study of the harmony of the world does not belong to the musician's domain of expertise but rather to that of the natural philosopher.[114] Other Parisian masters share this position. For instance, the *Compilatio Monacensis* and the Harley Anonymous describe *musica mundana* as *musica naturalis*.[115] Jacobus Leodiensis specifies that *musica mundana* is subalternated to natural philosophy[116] whereas, in an

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[111] F, fol. 252vb.

[112] '[N]ulla harmonia ex illo motu [sc. corporum celestium] causatur, nec talis musica mundana est possibilis.' (Radulphus Brito, *Questiones mathematicales*, 296). See also *Glossae in musicam Boecii*, GB-Occ 118, fol. 5v.

[113] See notably *Accessus philosophorum*, 208; *Questiones mathematice*, fol. 204va; Arnulph of Provence, *Divisio scientiarum*, 327; *Compendium circa quadrivium*, 374; Johannes Dacus, *Divisio scientie*, 29; *Abbreviatio in Musica Boecii*, 111. Among the music theorists, Jacobus Leodiensis proposes an interpretation of *musica mundana* similar to F's: 'Boethius et Pythagorici per symphoniam illam ex corporum coelestium motibus provenientem, intelligunt connexionem, ordinem, proportionem, concordiam vel quamcumque aliam convenientem habitudinem, quam habent orbes illi inter se in motu, situ, luminibus [et] virtutibus.' (*Speculum musicae*, I, 13, p. 47). Engelbert of Admont states more explicitly: 'Musica mundana consistit et consideratur in proportionibus motuum et magnitudinum corporum coelestium, et spatiorum distantiae situs et motus ipsorum […] quamvis Aristoteles secundo libro Coeli et mundi, evidentibus rationibus destruxerit et negaverit sonos corporum superiorum, licet alias proportiones motuum et magnitudinum corporum ipsorum et distantiarum ac spatiorum inter ea non negaverit' (*Musica*, I, 2, ed. P. Ernstbrunner [Tutzing, 1998], 167-8).

[114] F, fol. 252vb.

[115] *Compilatio Monacensis*, 110; Harley Anonymous, *Questiones mathematicales*, 310. See also Albertus Magnus, *Politica*, VIII, 3, p. 482a.

[116] 'Et, secundum hoc, haec musicae species [sc. musica mundana] multis subalternatur scientiis ut naturali.' (*Speculum musicae*, I, 13, p. 49)

anonymous unpublished fourteenth-century *Ars musica*, perhaps by Johannes de Muris, the metaphysician becomes the expert in the music of the spheres.[117]

Turning now to *musica instrumentalis*, F renames this branch of music *musica organica*. In contrast with the *musica organica* described in Isidore of Seville's *Etymologies*, which stood for the music made with wind instruments,[118] the term receives a much broader scope of application here:

> Sed musica organica est dupla: quedam est musica docens et quedam utens. De musica organica utente [*ms*. usualis] nichil ad propositum quia talis est practica et non speculativa. Musica vero organica docens est duplex: quedam est que fit per interiora et quedam que fit per exteriora. Musica docens que fit per exteriora iterum dividit[ur]: quia quedam est que fit ex flatu sicut apparet in tuba, quedam ex percussione sicut in cythara et quedam ex utroque sicut in calamella - ibi concurrit utrumque, tam flatus quam percussio. Sed musica docens que fit per intrinseca iterum dividitur: quia quedam est vocalis, quedam vero rithmica et quedam metrica, quas duas ultimas grammaticus considerat.[119]

Musica organica is first subdivided into *musica organica utens* and *musica organica docens*. The opposition *utens*/*docens*, relatively common in the disciplines of the *trivium*, is for the first time applied to music.[120] The participle *utens* implies a practical application of the discipline whereas *docens* clearly indicates that the discipline is cultivated for its own sake. The commentator disregards the *musica organica utens* regarded as a practical discipline. Radulphus Brito, the *Compilatio Monacensis* or the Harley Anonymous follow

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[117] 'Mundana est in celo, stellis, speris, ordinibus elementorum […] ergo [ista] musica consideratur metaphysico [*ms*. metaphysici].' (*Ars musica*, F-Pn lat. 7378A, fol. 58ra). On this text and Johannes de Muris see L. Gushee, 'New Sources for the Biography of Johannes de Muris', *JAMS*, 22 (1969), 13.

[118] See Isidore of Seville, *Libri Etymologiarum*, ed. W. Lindsay (Oxford, 1911), III, 21, 1-3. This passage is also reproduced in the two most influential thirteenth-century encyclopedias: Vincent of Beauvais' *Speculum doctrinale* (XVII, 31) and Bartholomeus Anglicus' *De natura rerum* (XIX, 8).

[119] F, fol. 252vb.

[120] Roger Bacon (*Opus Tertium*, 308 and *Communia mathematica*, 64) applies this distinction to rhetoric and poetics. He considers the *rhetorica utens* and the *poetica utens* as part of moral philosophy whereas the *rhetorica docens* and the *poetica docens* are subsumed under logic. The author of the *Accessus Philosophorum* (237-9) also applies the distinction *utens*/ *docens* to rhetoric. For several fourteenth-century definitions of the *logica utens* versus the *logica docens*, see S. Ebbesen, 'Is Logic Theoretical or Practical Knowledge?', in *Itinéraires d'Albert de Saxe*, ed. J. Biard (Paris, 1991), 267-83.

the same line of thought when they carefully exclude *musica practica* from their discussions of the epistemological status of music.[121]

In his description of *musica docens*, the commentator of F reintegrates two very common subdivisions of *musica instrumentalis*. Under the heading of *musica organica docens per exteriora*, he incorporates the traditional subdivision of *musica instrumentalis* according to the different families of musical instruments (percussions, strings or woodwinds and sometimes voice).[122] A surprising feature nonetheless is his intriguing mention of the chalumeau (*calamella*) as an instrument classified with both percussions and woodwinds.[123] Finally, describing the *musica organica docens per intrinseca*, the anonymous commentator then introduces another famous subdivision of *musica instrumentalis* into *musica harmonica* or *mellica*, *musica rithmica* and *musica metrica*.[124] Like the Harley Anonymous, he prefers using the term *musica vocalis* in place of *musica harmonica*, and in addition he clearly associates rhythmic and metric with grammar.[125] This obvious link established between music and grammar was common coin in the thirteenth century notably under the influence of Al Farabi's classification of sciences.[126] Elaborating the Arab philosopher's classification, the author of the introduction to philosophy *Philosophica Disciplina* (*c*.1240) underlined the relation between music, poetics, grammar and 'civil science' (*scientia civilis*).[127] This association with grammar is well appreciated by Roger Bacon who also establishes connections between music and the other arts of the trivium: '[m]usicus habet, he asserts, omnium istorum raciones et causas et demonstrationes

[121] Radulphus Brito, *Questiones mathematicales*, 289; *Compilatio Monacensis*, 102; Harley Anonymous, *Questiones mathematicales*, 311.
[122] This subdivision can be traced back to Boethius himself, see *De institutione musica*, I, 3 p. 189.
[123] See the definitions given by Papias: 'Calamaula, canna de qua cantatur' (*Vocabularium*, F-Pn, lat.7609 fol. 31rb); and Hugutio of Pisa: 'Calamella, canna cum qua quis canit, unde calamellarius qui de ea canit, /*superscrip*. flaute gallice/ a calamus et aula' (*Derivationes magnae*, GB-Ob 376, fol. 22vb).
[124] Cassiodorus reports this subdivision in his *Institutiones* (ed. R. Mynors [Oxford, 1933], II, 5, p. 144); and also Isidore of Seville, *Libri Etymologiarum,* III, 18, 1.
[125] Harley Anonymous, *Questiones mathematicales*, 310.
[126] Al-Farabi, *De ortu scientiarum*, ed. C. Baeumker (Münster, 1918), 22. See also Domenicus Gundissalinus, *De divisione scientiarum*, ed. L. Baur (Münster, 1903), 54-5.
[127] *Philosophica disciplina,* 278.

dare, et grammatici, poete, logici, rethorici et alii ab eo accipiunt quilibet secundum usum suum'.[128] Many Parisian masters, including Bacon, and the authors of the *Philosophica Disciplina* and F recognised the intrinsic vocal nature of *musica* and they placed it at the juncture of the old *quadrivium* and *trivium*. The discipline appeared as an intermediate science not only poised between mathematics and natural philosophy but also between mathematics and the arts of language.

From the classification of music proposed in F and by these other authors, it is possible to affirm that only the theoretical parts of music dealing with musical instruments and with the human voice enter into the definition of music as a *scientia media*. Given F's detailed classification of music, one can legitimately wonder why the anonymous commentator went through this painstaking process whereas other authors expedited the problem within a few lines. In fact, the classification does not add anything substantial to the question at hand, that is, whether music is more mathematical or more physical. Therefore such a refined *exposé* is no more than a rhetorical display of erudition where the anonymous commentator lavishly flaunts the extent of his musical knowledge, a knowledge limited to definition and classification.

Epistemology

The second main argument reaffirming the mathematical nature of the *scientie medie* in general and of music in particular concerns epistemology. More than their predecessors, early fourteenth-century commentators insist on the *ratio considerandi* ('way of considering') or *modus considerandi* ('mode of considering') as a prevalent criterion for epistemic individuation. As Radulphus Brito rightly remarks:

[128] Roger Bacon, *Communia mathematica*, ed. R. Steele (Oxford, 1940), 55. The *alii* depending upon music are the moralists who in composing sermons borrow 'a logico formam arguendi et a musico omnem decorem et ornatum'. See also Roger Bacon, *Opus Tertium*, 307; Id., *Opus Maius* I, 100-3.

> Una et eadem res potest in diversis scientiis diversimode considerari et ideo magis denominatur scientia a modo considerandi subiectum quam ab eo quod est subiectum.[129]

Because the same subject can be approached in various ways, cutting out, delimiting and ordering the field of the knowable is indeed not sufficient to establish definite boundaries between sciences.[130] For instance, as Radulphus Brito emphasizes, both natural philosophy and metaphysics deal with substance or the prime mover, but these two sciences differ from one another because of their specific modes of considering these objects.[131]

It is the discriminative power of the *modus considerandi* or *ratio considerandi* that highlights the difference between music and natural philosophy and clearly underscores the mathematical character of the former. As Radulphus Brito remarks, both music and natural philosophy deal with sound. Yet problems related to sound generation or the mechanisms of hearing fall beyond the musician's scope of inquiry:

> Musica non considerat sonum ut est sensibilis. Non enim considerat quomodo generatur sonus neque quomodo immutat auditum, sed considerat quomodo unus sonus est proportionatus alteri sono et considerat cum his melodiam consequentem illam proportionem; modo proportio dupla uel tripla est quid mathematicum; ergo magis considerat sonum sub ratione quantitatis quam ut est sensibilis.[132]

To give an example, when a musician concludes that two sounds form an octave, he reaches this conclusion not by taking the physical qualities of sound into consideration but by noting that the two sounds are proportionate according to a ratio of 2:1.[133]

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[129] Radulphus Brito, *Questiones super Physicam*, fol. 20ra. As the anonymous author of F more directly puts it: 'unius scientie simpliciter debet esse una ratio considerandi simpliciter'(fol. 252rb). See also Radulphus Brito, *Questiones mathematicales*, 290; Harley Anonymous, 311; *Compilatio Monacensis*, 101.

[130] See for instance Radulphus Brito: 'Distinctio modi considerandi scibile sufficit ad diversitatem scientiarum et non distinctio scibilis absolute, sed secundum quod est aliquid consideratum secundum diversas rationes secundum hoc distinguuntur scientiae.' (*Questiones mathematicales*, 291).

[131] 'Naturalis etiam et metaphysica sunt de substantia primi motoris [*ed*. primo motore] sub alia et alia ratione. Distinctio scibilium absolute non facit distinctionem in scientiis sed distinctio in modo considerandi scibile' (Radulphus Brito, *Questiones mathematicales*, 291). Bartholomeus of Bruges (*Questiones super Physicam*, fols. 68ra-b) gives the example of metaphysics and logic as sciences dealing both with being as a whole.

[132] Radulphus Brito, *Questiones super Physicam*, fol. 20ra; and also Id., *Questiones mathematicales*, 290.

[133] 'Sicut quod diapason sit inter duos sonos, illa conclusio non concluditur in musica ratione qua naturalis est, sed quia unus sonos est proportionalis alteri in dupla proportione.' (Radulphus Brito, *Questiones super Physicam*, fol. 20ra).

The commentators after Brito introduce the notion of a 'formal way of considering' (*formalis ratio considerandi*) as the definitional principle of music.[134] According to F, for instance, when a mixture of sounds or consonance (*proportio sonorum uel consonantia vocum*) is approached as an aural percept, it is without any doubt considered as 'something natural' (*aliquid naturale*) belonging to the realm of the natural philosopher. However, when approached in terms of a numerical ratio, the same mixture, be it consonant or dissonant, becomes 'something mathematical' (*aliquid mathematicum*). This second kind of approach is a 'formal way of considering' specific to the musician. This is why music is indubitably a mathematical science.[135]

As noted in F, the 'formal way of considering' establishes music's mathematical nature; it also helps to differentiate it from arithmetic.[136] For Radulphus Brito, the modes of considering of music and arithmetic are indeed very similar: '[licet] in arismetrica et musica aliquid naturale sit subiectum, tamen non est ibi subiectum ratione qua naturale est sed magis ratione qua quantum'.[137] Yet, music differs from arithmetic because it does not consider consonance or the proportion between sounds 'sub ratione numeri absolute' but rather 'sub ratione numeri contracti per sonos'.[138]

It is not surprising that Brito introduces here the notion of *contractio* (specification) to distinguish the mode of considering specific to music from that specific to arithmetic. As

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[134] 'Ille scientie sunt mathematice et non naturales quarum formalis ratio considerandi est mathematica; sed formalis ratio considerandi in musica et astrologia est huiusmodi; ergo, etc.' (F, fol. 252vb). Bartholomeus of Bruges affirms in a similar way: 'Formale in scientia est duplex: quedam est formale considerationis et est illud sub ratione cuius omnia considerantur […]modo scientia debet denominari a formali in consideratione.' (*Questiones super Physicam*, fol. 69va). See also Harley Anonymous, *Questiones mathematicales*, 308; *Compilatio Monacensis*, 102.

[135] 'Accipiamus hoc quod est proportio sonorum uel consonantia vocum. Ista proportio potest accipi dupliciter: uno modo sub ratione qua movet auditum, et sic sine dubio est aliquid naturale; alio modo potest accipi sonus prout est in numerali proportione, scilicet consonanti uel disconsonanti, uel aliter potest accipi sonus prout est in dupla, uel tripla, uel sextupla, et sic talis ratio considerandi est mathematica et non naturalis et non quecumque mathematica, sed mathematica que est musica.' (F, fol. 252vb).

[136] 'Musica considerat sonum sub ratione soni aut sub ratione numeri, concedo. Et tu dicis "non sub ratione numeri" quia tunc non differet ab arismetrica, dico quod verum est. In ratione formali considerandi bene differt.' (F, 252va).

[137] Radulphus Brito, *Questiones super Physicam*, fol. 20ra.

[138] Radulphus Brito, *Questiones mathematicales*, 292. For similar comments see also Harley Anonymous, *Questiones mathematicales*, 312; and Bartholomeus of Bruges, *Questiones super Physicam*, fol. 68rb.

seen above, this notion played a major role in Kilwardby and Albert the Great's definitions of music. In fact, Brito also shares with the two thirteenth-century masters the same realistic attitude regarding the ontological status of the traditionally accepted subject of music, the *numerus sonorus* or *numerus relatus ad sonos*.[139] However, he is the only one among later commentators to do so. Rather than defining, like Kilwardby, Albert and Brito, the subject of music as a material specification (*contractio materialis*) of number by sound, they prefer to redefine it as a formal specification (*contractio formalis*) of sound by number.[140] Hence they avoid the kind of ontological realism closely associated with the notion of *contractio materialis*.[141] As the Harley Anonymous describes it, the subject of music is less the *numerus sonorus* and rather the *sonus numeratus* or the *sonus numerabilis* where sound is the *fundamentum* and number a formal specification, an 'accident' of sound (*accidens soni*).[142] This process of formal specification is nothing but the result of the particular formal mode of considering, which makes music a science more mathematical than physical.

At the end of this foray into the Parisian debate over the epistemological status of music and the *scientie medie c.*1300, it is clear that fourteenth-century commentators do not bring outstandingly new elements to the artists' definition of *musica* and its subject matter.

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[139] In several passages of his *Questiones mathematicales*, Brito manifests an undeniable realism regarding number: 'Primo mathematicalia sunt in esse coniuncta cum sensibilibus, secundo quod sunt coniuncta cum eis actualiter […] omne ens mathematicum est numerus uel magnitudo uel aliqua passio consequens ad ista; modo omnis numerus uel magnitudo et per consequens omnes passiones ad ista consequentes sunt coniuncta actualiter cum sensibilibus.' (*Questiones mathematicales*, F-Pn lat. 16609, q. 3, fol. 31va). Or again: 'Numerus est aliquod accidens reale, modo accidens reale non habet esse solum in anima; quare etc. Maior patet quia entia realia sunt in re extra.' (Ibid., q. 19, fol. 36ra).

[140] 'Duplex est contractio: materialis et formalis. Contractio materialis quasi fit per additionem conditionis materialis. Alia est contractio formalis que fit ex additione differentie formalis. Tunc dico quod a formali dicente additionem differentie formalis bene fit denominatio, sed a formali que dicit contractionem per differentiam formalem bene debet scientia denominari; modo illud [non] est naturale in musica uel astrologia sed mathematicum; ideo relinquitur scientias medias debere vocari mathematicas'. (Bartholomeus of Bruges, *Questiones super Physicam*, fol. 69va). See also F, fol. 252vb; Harley Anonymous, *Questiones mathematicales*, 311-312; *Compilatio Monacensis*, 101.

[141] This is corroborated by the fact that Bartholomeus of Bruges, the Harley Anonymous and some of the authors of the *Compilatio Monacensis* hold an anti-realist view regarding the ontological status of number. In short, their respective positions are similar to that of Averroes and Thomas Aquinas: number exists in extra-mental things only *in potentia* waiting to be actualised by the soul that counts. See Bartholomeus of Bruges, *Questiones super Physicam*, IV, q. 30 (Utrum tempus sit numerus), fols. 105ra-107ra; Harley Anonymous, *Questiones mathematicales*, GB- Lbl Harley 1, q. 11 (Utrum numerus sit genus sive ens aliquod reale), fols. 157rb-158rb; *Compilatio Monacensis*, q. 17 (Utrum numerus sit ens reale extra animam), 116-119. Because of the fragmentary nature of F, the author's view on the question remains uncertain.

[142] See Harley Anonymous, *Questiones mathematicales*, 311; *Compilatio Monacensis*, 93.

They depart from their predecessors by showing the flaws in Thomas Aquinas' bold attempt to stress the physical nature of music. Reaffirming the mathematical nature of music, they emphasize the role of the 'mode of considering' in the definition of science. Such an emphasis eventually leads to the introduction of the conceptual opposition of matter versus form to explain the ambivalence of music's procedures. It also leads to the adoption of an anti-realist position regarding the ontological status of the subject of music. The *numerus sonorus*, or as they preferred to call it, the *sonus numeratus*, is denied an extra-mental existence and appears as the construct moulded by the 'mode of considering' physical reality proper to the musician.

Conclusion

The relatively poor harvest of musical discussions in Parisian commentaries on Aristotle simply mirrors the very limited, almost anecdotal, role granted to this science in the Aristotelian corpus. Paradoxically, the Parisian masters did not concentrate on the most extensive passages dealing with music, passages like *De Caelo* II, 9 or *De anima* I, 3 where Aristotle harshly criticises the musical beliefs of the Platonists and Pythagoreans. Such a lack of interest may either be interpreted as a sign of sheer indifference to such issues as the music of spheres or the harmony of the soul or simply as a sign of the consensual acceptance of Aristotle's views on these matters.

In fact, only the two short remarks from the *Physics* and the *Posterior analytics* about the epistemological specificities of *musica* captured the intellectual curiosity of the Parisian masters and gave rise to some controversies. Yet again, the primary focus of the masters was less to provide a valid epistemological definition of *musica* than to explore the meanders of Aristotelian epistemology. Music was not an issue in itself but only an

example, a model-discipline that would help to tackle the problems of the subalternation of the sciences and the *scientie medie* which themselves were part of broader problematics related, respectively, to the definition of science and the nature of mathematical knowledge.[143]

Nevertheless, the discussions contributed to the creation of a new model for *musica*. Because Aristotle had not been loquacious in his description of music, the Parisian masters turned to Boethius' *De institutione musica* to fill in the blanks. As a result of this philosophical muddle, music was eventually redefined as a *scientia media*, an intermediate science suspended between natural philosophy and mathematics. It remained a mathematical science subordinated to arithmetic, while its scope of application was limited to a newly constructed subject indiscriminately called *consonantia*, *numerus sonorus*, *sonus numeratus*, *proportio sonorum*, etc. This subject, determined formally by number and materially by sound, shared with music's method and procedure the same epistemological ambivalence.

The particular inclination for epistemology echoes the general trend regarding music already hinted at in our survey of the teaching handbooks and the examination compendia of the Arts faculty. As we have seen, the introductory literature and the commentaries on the *Physics* and the *Posterior analytics* share a community of problems and of views regarding the classification and the definition of music (subalternation, notion of *contractio*, definition of the subject matter of music, etc.). Such correspondence may not be coincidental. Indeed, the sections on music in the introductory literature could well have provided the minimal musical knowledge required to interpret and discuss with greater ease and insight some aspects of the theory of subalternation or of the definition of the *scientie medie*. If these texts truly reflect the teaching of music at the Arts faculty of Paris, then it is possible that

[143] For instance, Giles of Rome insightfully affirms that the *scientie medie* have no aim other than to elucidate the specific abstract nature of mathematical knowledge as opposed to physical knowledge: 'Patet per huiusmodi scientias medias demonstratio mathematica esset abstracta […] Notandum etiam quod sicut per huiusmodi scientias que sunt medie inter mathematicam et physicam ostenditur mathematica esse abstracta sic per easdem ostenditur phisica non esse abstracta' (Giles or Rome, *In Physicam*, fol. 31va).

part of this teaching was made with a view to comment and digress on the musical references of the *Physics* and the *Posterior analytics*. In this case, this would mean that the teaching of music at the Arts faculty was in fact assigned a particular a function: a 'hermeneutical function'. After all, the masters and students of the Arts faculty of Paris strenuously cultivated the study of Aristotle, and the interpretation of his works constituted the greatest bulk of academic activities.

It is possible that discussions about music analysed in this chapter appear rather staid in comparison with the ebullient and passionate debates that blossomed at the time, debates about such fundamental themes as the agent intellect, the plurality of forms, the eternity of the world or the nature of continua. Perhaps it is because discussions about epistemology escaped the shackles of institutional coercion and censorship. Even so, there were, in the Arts faculty, real discussions, which involved conflicting and contradictory opinions about the definition of music's subject matter, the determination of its method and the delimitation of its place in the late medieval *episteme*.

Thirteenth and fourteenth-century music theorists embraced this definition, some of whom probably also frequented the classrooms of the *Rue du Fouarre*. Johannes de Garlandia and most Parisian music theorists after him who relied on his works, also adopted the *numerus relatus ad sonos* as the subject for *musica*.[144] We have seen how Johannes de Grocheio defined the subject of music as *numerus relatus ad sonos* and consonances as ambivalent entities composed of a mathematical form with a sounding matter.[145] Some music theorists even went beyond mere formulae to incorporate contemporary discussions from the Arts faculty on the status of music as a *scientia media*. Jacobus Leodiensis incorporated in Book I of his *Speculum musicae* extensive passages from Robert

[144] Johannes de Garlandia, *Musica plana*, 11. The passage is also quoted in full or in part in Hieronymus de Moravia, *Tractatus de musica*, 10; Johannes de Grocheio, *De musica*, 46; Anonymous of St Emmeram, *De musica mensurata*, ed. J. Yudkin (Bloomington, 1990), 67, 102 and 186; and Lambertus, *Ars musica*, F-Pn lat. 6755/2, fol. 71rb [This passage lacks in the edition of the treatise in *CS* (1, 251-281) and in the other manuscripts of the treatise].

[145] See Chapter 2, 138.

Kilwardby's *De ortu scientiarum*. Another exemplary occurrence of such incorporation is perhaps to be found in the hitherto unpublished *Summula musicae* by Henricus Helene, probably written *c*.1320.[146] Henricus' definition of *musica* is worth quoting at length, for it is strongly reminiscent of the views of the Parisian commentators of the *Physics* analysed above:

> Musica est scientia mathematica mixta, numeri sonori, id est ad sonos contracti, principia partes et passiones considerans […] Dicitur autem mathematica mixta quia non est pura sed mixta, sunt enim mathematice pure scilicet arismetica et geometria quia ille simpliciter abstrahunt ab omni materia sensibili ut videri habet *2° Physicorum*. Dicitur autem numeri sonori quia numerus ille huiusmodi scientie est subiectum adequatum. Ex quo etiam patet quod musica est arismetice subalternata quia contrahit subiectum arismetice, scilicet numerum, per conditionem accidentalem, scilicet sonum. Unde etiam ex principiis arithmetice notitia musice non modicum capite subsumentum. Dicitur autem principia, partes et passiones et cetera, quia iste tres sunt essentiales in qualibet scientia considerate, ut patet in *Primo Posteriorum*.[147]

Finally, the redefinition of music as a *scientia media* with an ambivalent subject also helped to shape the notational advances codified in Johannes de Muris' *Notitia artis musice*, notably through the idea that any measured vocal sound (*vox mensurata)* possesses a mathematical as well as a physical form.[148] This idea was at the heart of Johannes de Muris' *gradus*-theory and of his affirmation that vocal sound, when envisioned as a natural and perceptible thing, admits a maximal and a minimal duration.[149] It was therefore instrumental in defining the nature of the *minima*.

Thus, what came out of the debates about *musica* in the Arts faculty of Paris was nothing short of an epistemological redefinition of the discipline in accordance with the new

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[146]On the date of this treatise, see C. Ruini, 'La *Summula musice* di Henricus Helene: note sulla tradizione manoscritta e sui rapporti con il contesto culturale del XIV secolo', in *Ars nova italiano del Trecento*, 6 (Certaldo, 1993), 361-68.

[147] Henricus Helene, *Summula musicae*, I-Vm lat. Cl. VIII 24, fol. 14v; and also GB-Lbl Add 23220, fol. 23r.

[148] See M. Haas, 'Musik zwischen Mathematik und Physik: Zur Bedeutung der Notation in den *Notitia artis musicae* des Johannes de Muris', in *Festschrift für Arno Volk*, ed. H. Oesch (Cologne, 1974), 31-46. See also Hentschel, *Sinnlichkeit*, 166-173.

[149] Johannes de Muris, *Notitia artis musicae*, 70. The theory of *maxima* and *minima naturalia* and *sensibilia* stems from Aristotle's *Physics* and from his *De sensu et sensato*. It was much debated in thirteenth- and fourteenth-century commentaries on these two texts. For the *Physics* commentaries see A. Maier, *Metaphysische*, 155-215. See also Thomas Aquinas, *Sententia libri De sensu*, I, 15 and 18; Adam Bocfeld, *Expositio in De sensu*, GB-Bac 313, fol. 141ra; Peter of Auvergne, *Questiones in De sensu*, GB-Omec 275, fol. 209ra-b; Johannes de Jandun, *Questiones in De sensu*, GB-Ob canon. misc. 222, fol. 18r-v; Nicole Oresme, *Questiones in De sensu*, D-EF CA 4° 299, fols. 144va-145ra.

dominant philosophical paradigm, namely Aristotelianism. This redefinition contributed to promote an epistemological model for *musica* which had momentous influence on both music theorists and masters of Arts, well into the Renaissance and the Early Modern period.[150]

[150] See Gioseffo Zarlino: 'Musica […] si fa ad essa Arithmetica subalternata, tenendo il Numero sonoro per suo soggetto […]. Per questo adunque sarà manifesto, che la Musica non si potrà dire ne semplicemente mathematica, ne semplicemente naturale; ma si bene parte naturale, et parte mathematica, et conseguentemente' (*Institutioni harmoniche*, 30-31). On Zarlino's conception of music, see also Hirtler, *Die Musik*, 163-181. Zarlino's remarks on the epistemological status of music will notably be copied by Andreas Werckmeister, *Musicae mathematicae* (Merseburg, 1686; facs. repr. Hildesheim, 1971), 12; and by Jean-Philippe Rameau, *Traité de l'harmonie réduite à ses principes naturels* (Paris, 1722), 18.

CHAPTER 4

SCHOLASTIC QUESTIONS ON MUSIC FROM THE ARTS FACULTY OF PARIS

Scholastic activities in the Arts faculty were neither limited to commentaries on Aristotelian works nor to the dispute of problems taken directly therefrom. Disputations that were not centred on a particular textbook also played a central role in academic instruction and teaching. They took place in a vast array of disciplines (grammar, logic, natural philosophy, moral philosophy and even mathematics) as the numerous extant disputed questions that do not bear any direct link with a curricular textbook indicate.[1] Although some of these questions are in fact treatises couched in a dialectical form, a great majority of them can be seen as more or less accurate written records of actual disputations during which the masters and students of Arts discussed themes and problems that they deemed important. Have any questions of that kind survived for the discipline of music? If so, to what extent may they be pictured as records of actual disputations? What new facet of the teaching of music in the Arts faculty do these questions unveil? How do they modify the landscape of such a teaching charted so far?

A systematic survey of the scholastic questions on music in the medieval universities has never been undertaken. Several questions of this kind survive. Most of them fall outside the chronological and geographical limits of this study. There exist several unpublished *questiones* on music from the Arts faculty of Prague written between 1409-1417 by renowned Bohemian masters such as Johannes Hus, Mattheus de Knin, Simon de Tissnov or Procopius de Kladrub.[2] Max Haas has recently mentioned one question on the music of the

[1] See O. Weijers, *La disputatio à la faculté des Arts de Paris (1200-1350). Esquisse d'une typologie*, (Turnhout, 1995), 92-117.

[2] In chronological order: 1) Mattheus de Knin (1409), 'Utrum consonancie musicales sint commensurabiles ad invicem' and 'Utrum omnes consonantie musicales ex tonis et semitoniis composite specifice inter se distinguantur' (CZ-Pak L 45, fols. 143va-145ra); 2) Johannes Hus (1411), 'Utrum tantum tres, scilicet dyapason, dyatessaron et dyapente, sint perfecte consonantie musicales comensurabiles ad invicem' (CZ-Pnm V C 42, fols. 45va-b); 3) Simon de Tissnov (1416), 'Utrum tonum, unde originantur consonancie musicales, dividi per equalia sit possibile' (CZ-Pnm V C 4, fols. 130ra-vb); Procopius de Kladrub (1417), 'Utrum sint

spheres probably discussed in Cambridge at the beginning of the fifteenth century.[3] A reference to Walter Burley's commentary on Aristotle's *De caelo* written *c.*1330 (fol. 8r) constitutes a secure *terminus post quem* for this source. Another hitherto unnoticed question on music is transmitted on fols. 88v-89v in a fifteenth-century English collection, GB-Ob Digby 92 which contains solemn disputations in miscellaneous disciplines ranging from optics and astronomy to metaphysics, ethics and rhetoric. Restating an enduring *topos* of music theory, the anonymous author of this question concentrates on the ethical values of music for noble youth.[4] To support his argument and to display his musical erudition, he invokes a vast array of authorities: notably Aristotle's *Politics*, Giles of Rome's *De regimine principum*, Boethius' *De institutione musica*, Isidore of Seville's *Etymologiae*, Bartholomeus Anglicus' *De proprietatibus rerum* and Guido of Arezzo's *Micrologus*. Finally, Cecilia Panti has recently analysed the set of four intricate and protracted music questions preserved in F-Pn lat.7372, probably composed by a Paduan master around the beginning of the fifteenth century.[5]

Up until now, two types of scholastic questions about music from the University of Paris have been uncovered. The first type of question is a product of the faculty of theology: the *questio de quolibet*.[6] Three *questiones de quolibet* elaborated by two prominent Parisian theologians, Richard of Middleton in 1287 and Peter of Alvernia in 1301, broach issues

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tantum tres consonancie musicales perfecte super tres proportiones arismeticas fundate' (CZ-Pak L 27, fols. 114rb-vb).

[3] 'Numquid in corporibus celi superioribus musica sit modulatio?' (GB-Ctc R. 14 26, fols. 6r-9r). See M. Haas, 'Studien zur mittelalterlichen Musiklehre I: Eine Übersicht über die Musiklehre im Kontext der Philosophie des 13. und frühen 14. Jahrhunderts', *Forum Musicologicum*, 3 (1982), 347.

[4] 'Reverende magister questionem difficilem scientie musicalis mihi inponit cuius titulus talis est: Utrum suavissima mater musica, melodiarum dicta domina [et] coheres quadruvalium lactet filiolos dominorum delicatis verbibus virtutis et morum ut artium una liberalium?' (GB-Ob Digby 92, fol. 88v).

[5] 1) 'Utrum musica sit scientia' (fols. 1r-6r); 2) 'Utrum sonus sit subiectum in musica' (fols. 6r-46r); 3) 'Utrum diffinitio soni data a Boecio primo sue musice capitulo 3° cum dicit "sonus est percussio aeris indissoluta usque ad auditum" sit bene data (fols. 46r-67v)'; 4) 'Utrum maximus numerus inequalitatis sit quinarius, scilicet multiplex, superparticularis, superpartiens, multiplex superparticularis, multiplex superpartiens' (fols. 67v-72r). Cecilia Panti has edited the first question in her article, 'The first *Questio* of ms Paris BN lat 7372: *Utrum musica sit scientia*', *Studi Medievali*, ser. 3, 33 (1992), 265-313. On the influence of these questions on the music theorist Ugolino of Orvieto, see Ead., 'La *Declaratio musicae disciplinae* di Ugolino da Orvieto', *Rivista Italiana di Musicologia*, 24/1 (1989), 3-48.

[6] On the practice of the *quodlibet*, see B. C. Bazan and *al.*, *Les questions disputées et les questions quodlibétiques dans les facultés de théologie, de droit et de médecine* (Turnhout, 1985).

related to the ethical, therapeutic and even supernatural powers of music.[7] To these three Parisian questions we can also add the famous *Quodlibet XI, Questio 19* ('Utrum corpora celestia per suum motum causent aliquam armoniam') about the music of the spheres, discussed in Oxford in 1314 by the Dominican master Nicolas Trevet.[8] The second type of music questions comprises the short, barely articulated questions grappling with epistemological issues, such as those found in the examination compendia and in Radulphus Brito's *Questiones mathematicales*.[9]

In addition to this relatively well-known material, other hitherto unnoticed or neglected sources are likely to modify our understanding of the place of music in the Arts faculty of Paris. These sources contain scholastic questions on music, which broach more technical problems of music theory and thus overtly depart from the epistemological orientation of musical discourse typical of the Arts faculty. We shall first turn to a collection of mathematical texts transmitted in a single manuscript now at Erfurt, ms. D-EF CA 4° 369 (hereafter E369), probably compiled by a German student at the University of Paris. I discovered in this miscellany two well-articulated music questions. Not only do these two important questions tackle musical issues, which in the context of the Arts faculty may appear unusual, but they also represent the most extensive examples of music questions discovered to date. The second source that will be analysed in this chapter is, in contrast, very laconic, to say the least. It is a list of titles for 37 questions about music, unfortunately left undeveloped, transmitted in a single fourteenth-century manuscript, F-Pn lat. 7378A. This *Sammelcodex*, comprising several parts bound at an unknown date, is well known to

[7] The three *quodlibeta* are mentioned by Haas, 'Studien', 346-7. Richard of Middleton's *Quodlibet III, Questio 8* ('Utrum herbae uel harmoniae possint impedire daemonem in vexando homines') is edited in *Quodlibeta Ricardi de Mediavilla* (Brixiae, 1591), 96-7. Peter of Alvernia's *Quodlibet VI*, *Questio 16* ('Utrum harmoniae musicales sint excitativae passionum') and *Questio 17* ('Utrum harmoniae musicae ad mores valent seu virtutes') are edited and discussed by Frank Hentschel in his 'Der verjagte Dämon: Mittelalterliche Gedanken zur Wirkung der Musik aus der Zeit um 1300, mit einer Edition der Quaestiones 16 und 17 aus Quodlibet VI des Petrus d'Auvergne', *Miscellanea Mediaevalia*, 27, eds. J. Aertsen and A. Speer (Berlin, 2000), 412-21.
[8] The text is edited by M.L. Lord, 'Virgil's *Eclogues*, Nicolas Trevet and the Harmony of the Spheres', *Medieval Studies*, 54 (1992), 267-273.
[9] See above Chapter 1, 38-44.

musicologists as one of the earliest sources for the so-called *ars nova* theory. Yet, this list of music questions has hitherto gone unheeded. Although it is impossible to ascertain whether the questions were projected disputations or simply the excogitations of an inquisitive mind, they nonetheless present the wide range of problems that could have interested the members of the Arts faculty of Paris. Finally, the last section of this chapter will be devoted to thirteenth- and fourteenth-century music theory treatises and more particularly to those treatises couched, entirely or in part, in form of the scholastic *questio*. These questions may embody the more or less distant written reverberations of heated disputations on more practical aspects of music theory and most notably on issues linked to the notation and practice of rhythm. Analysing them will no doubt help cast light on possible connections between the academic world of the Arts faculty and the world of musical performance, at the crucial time when the art of polyphony was gaining momentum.

The Erfurt Questions

E369 is a *Sammelcodex* composed of seventeen different parts, written in various hands, which comprise mainly tracts on astronomy and on the algorism.[10] According to a half-erased *ex-libris*, the manuscript once belonged to a *magister Hermanus de Est…* who could tentatively be identified with an otherwise unknown Hermanus de Esternaco (Echternach in Luxembourg) mentioned in a 1313 record from the University of Paris.[11] Parts of the manuscript were written, as indicated by several colophons and astronomical notes, around 1325-8 in the Northern Rhine valley (notably around Syburg and Renne).[12]

[10] For a complete description of the content of this manuscript see W. Schum, *Beschreibendes Verzeichniss der Amplonianischen Handschrift-Sammlung zu Erfurt* (Berlin, 1887), 617-621.
[11] E469, fol. 1r. The 1313 document is edited in *CUP*, II, no. 703.
[12] See for instance fols. 5v, 15r, 28r and 218v. On fol. 113r the latitudes and longitudes of Toulouse, Florence, Marseilles and Constantinople are inscribed in the margin, as well as on fols. 218r-v, the coordinates for Vienna, Würzburg, Strasburg, Magdeburg, Mainz, Cologne, Braunschweig, Dordrecht and Utrecht.

Several scholastic questions are interspersed in the gatherings of E369: one about the science of *perspectiva*, three linked to astronomy, two about natural philosophy,[13] one about geometry and finally two about music. Although disseminated in several different quires of the manuscript, all of these scholastic questions of E369 (including those on music) possess a similar argumentative structure. The most obvious implication of such similarity is that all the questions emanate from the same intellectual milieu, if not from the same individual, perhaps *magister Hermanus* himself. The questions usually open with one or two arguments *pro* and *contra,* followed by a very lengthy magistral development or *determinatio*. The formula 'circa istam questionem sciendum quod…' introduces a list of the several points expounded during the *determinatio*. When developed, each point is adorned with examples, *dubia* and other *signa* underpinning the argument. Then the question concludes on the refutation of the *contra* arguments. The emphasis on the long *determinatio*, the absence of marks of orality, and the reduction of the truly dialectical elements of the question to a minimum indicate that the *questiones* of E369 appear more as written compositions than as reportations of actual disputations. This does not imply, however, that the dialectical method is used only as a literary or discursive technique and that the questions should in fact be considered as short treatises fashioned with such a technique and not as re-worked records of disputation sessions.

All the questions scattered in the Erfurt manuscript are written by various hands. Only the two musical questions and the geometrical one form a distinct codicological unit. The quire containing these three questions is written on two columns in a neat fourteenth-century cursive continental gothic script. From a doctrinal point of view the geometrical

[13] Respectively: 'Queritur an visio fiat per extramissionem' (fols. 4ra-vb); 'Utrum motoribus sit aliquis motor', 'Utrum natura quinte essentie esse in celo' and 'Utrum ultra torridam zonam sit habitabilis terra' (fols. 179ra-181va); 'Utrum fluxus et refluxus maris infra diem et noctem bis fiat' and 'Utrum verior sit natura aque quantum ad naturalem speciem quam si esset salsam sicut est mare' (fols. 219ra-230rb).

question is not at all related to the music questions.[14] Turning to the Erfurt music questions, one can note a sheer departure from the kind of epistemological quandaries discussed in the examination compendia or in Radulphus Brito's *Questiones mathematicales*. The first question deals with a commonplace problem of medieval music theory, the problem of the inclusion of the *diapason cum diatessaron* or eleventh among the primary musical consonances. The second question, in contrast, is not concerned with consonance theory but with *musica mensurabilis*. Because of the original and unusual character of these topics in the context of the Arts faculty of Paris, the two Erfurt questions deserve closer scrutiny.

The Eleventh: between Reason and Sensation

Can the *diapason cum diatessaron* be considered as a consonance? Or as the anonymous author of the first Erfurt questions puts it:

> Utrum praeter 5 consonantias musicales: sesquiterciam, sesquialteram, duplam, triplam, quadruplam, que aliis nominibus dicuntur diatessaron, dyapente, dyapason, dyapason cum diapente, dupla dyapason, utrum inquam, praeter istas 5, sit dare [*ms* datam] consonantiam sextam, scilicet dyapason cum dyatessaron, quae est [in] numeris dupla superbipartiens tercias, quae sit vera consonantia non offendens auditum?[15]

The problem of the *diapason cum diatessaron* or eleventh is a *topos* of music theory that can be traced back to Boethius' *De institutione musica*. In Book V of his treatise, Boethius reports Ptolemy's arguments for including the interval among the consonances.[16] Such an inclusion is in blatant contradiction with one of the central precepts of the mathematically

[14] This very long question (fols. 121ra-124va) deals with a problem of three-dimensional geometry based on Aristotle's critique of Democritus' attempt to assign a geometrical shape to each of the four elements. The question opens with a very solemn introduction followed by the proposition to be debated: 'Circa Aristotelem quem multi putant adeo fuisse in veritate sublimatum, ut recedere ab eius opinione reputent esse recedere a veritate, sicut de eo dicit Commentator in *3° De anima commento 27°* ubi sic dicit de Aristotele: "Credo enim quod iste homo fuit regula in natura et exemplar quod natura invenit ad demonstrandum ultimam perfectionem humanam." Et huius occasione quero in speciali: utrum videlicet dictum Aristotelis quod ipse dicit in *3° De celo et mundo* [*De caelo* III, 8, 306b2-307b24] ubi loquitur de 5 corporibus que sunt tetracedron, exacedron, octacedron, duodecedron et sextodecedron, utrum inquam, quod ipse dicit ibi de tetracedron et de piramide que repleat locum demonstrative probari possit esse falsum et impossibile.' (E369, fol. 121ra). Note that the geometrical figures of the demonstration are missing on fols. 121vb, 122ra and 125rb.

[15] E369, fol. 124va.

[16] Boethius, *De institutione musica*, V, 7-12.

based Pythagorean acoustic system that Boethius had, after Nicomachus, profusely expounded in the first two books of the treatise. Indeed, the inclusion of the eleventh, numerically equivalent to a *multiplex superpartiens* ratio (8:3), undermined the very foundations of Pythagorean consonance theory. This theory admitted only five consonances founded on the first multiple and superparticular ratios, that is to say on the four numbers of the Tetractys (1, 2, 3, 4): octave (2:1); *diapason cum diapente* (3:1); double octave (4:1), fifth (3:2) and fourth (4:3).[17]

In fact, as André Barbera notes, concealed behind the problem of the eleventh lies the larger philosophical issue of the ontological definition of consonance.[18] On the one hand, the Pythagoreans promote a view of consonance grounded in reason, mathematical certainty and metaphysics where number determines what is consonant. The eleventh is excluded because it is not generated by the numerical quaternary of the Tetractys. On the other hand, Ptolemy relies on a more empirical conception of consonance founded on the Aristotelian notion of mixture.[19] Confronting the rational beliefs of the Pythagoreans, he shifts the emphasis from the causal properties of number to sensory perception and the aural qualities of sound as the conditions *sine qua non* for consonance. For him, the eleventh is consonant first and foremost because it is heard as consonant.

Fulfilling his role as the main portal through which Antique music theory penetrated into the Middle Ages, Boethius transmitted both the Pythagorean and the Ptolemaic views of the eleventh and their underlying theories of consonance. Protected at any event by the shadow of Boethius' unswerving authority, medieval authors could then adopt and adapt

[17] See notably *De institutione musica*, I, 5-7, 10 and 23. On the exclusion of the eleventh, see *De institutione musica* II, 27. For a commentary on these passages see B. Münxelhaus, *Pythagoras musicus* (Bonn, 1976), 88-91. André Barbera analyses the same passages in relation to Ancient Greek sources in his 'The Consonant Eleventh and the Expansion of the Musical Tetractys: A Study of Ancient Pythagoreanism', *JMT*, 28/2 (1984), 193-201.
[18] Barbera, 'Eleventh', 193.
[19] On this notion see above Chapter 2, 141-143.

one position or the other according to their particular needs.[20] For instance, some Carolingian (Hucbald of St Amand, the *Musica Enchiriadis*, the *Scholica Enchiriadis*) and, later, Lotharingian music theorists (Berno of Reichenau, William of Hirsau and Frutolf of Michelsberg) found in Ptolemy's view a perfect *ad hoc* rationale to condone extemporized polyphonic practices such as doublings at the eleventh in parallel organum.[21] Thus, standing at the juncture of empiricism and rationalism, the problem of the *diapason cum diatessaron* became representative of the tension between reason and sensation in medieval consonance theory.

To find this issue broached in the setting of a scholastic *questio* raises an obvious question: why choose this particular problem of music theory? Was it a burning issue in the early fourteenth century? Indeed, it would seem that, in the first half of the fourteenth century, the problem of the *diapason cum diatessaron* captured the attention of prominent university-trained music theorists: Johannes de Muris and Jacobus Leodiensis in Paris, and Walter Odington at Oxford. Aware that the reasons advanced by Ptolemy for the inclusion of the eleventh had not been sufficiently discussed by Boethius,[22] they expatiated original philosophical arguments to critique the Ptolemaic position. Even though Odington rejects Ptolemy's analogy between the diapason and the decad, he nevertheless concedes that the eleventh can be heard as consonant. For Johannes de Muris and Jacobus Leodiensis, in contrast, the interval is very unpleasant to the ear because it is not founded on a superparticular or a multiple ratio. Thus, the three theorists connect acoustical and

[20] For a rapid overview of the positions of medieval music theorists on the eleventh, see Münxelhaus, *Pythagoras Musicus*, 91-3; and Barbera, 'Eleventh', 208-213.
[21] See for instance *Musica Enchiriadis*, ed. H Schmid, in *Musica et scolica enchiriadis una cum aliquibus tractatulis adiunctis* (Munich, 1981), 42-7; Berno Augiensis, Prologus in tonarium, ed. A. Rausch, *Die Musiktraktate des Abtes Bern von Reichenau* (Tutzing, 1999), 41.
[22] 'Hae igitur sunt rationes Ptolemaei bonae et pulchrae quare diatessaron cum diapason inter consonas numeret consonantias […] nec respondet Boethius ad eius positas rationes' (Jacobus Leodiensis, *Speculum musicae*, II, 109, p. 252).

numerical truths. Sensible euphony and hearing are invoked only to reaffirm the mathematical ideality and immutability of Pythagorean consonance theory.[23]

The first question of the Erfurt manuscript has to be relocated in the context of this renewed interest for the problem of the eleventh where the tension between empiricism and rationalism is so strongly manifested. Like Jacobus Leodiensis and Johannes de Muris, the anonymous author purports to demonstrate that Ptolemy's main argument for the inclusion of the *diapason cum diatessaron* among the consonances does not stand. For Ptolemy, the eleventh sounds consonant because the fourth is consonant and because when combined with the fourth, the octave preserves the sonorous qualities of this interval. This is possible because the octave is, according to Ptolemy, a 'homophonic interval' whose lower and higher voices are perceived 'almost like one voice' (*quasi una vocula*).[24] In order to invalidate this argument, the anonymous author wonders whether this homophonic property can be found in other intervals. In the latter case, one would have to consider as consonant all compounds formed with such intervals.

The anonymous author opens his invalidation of Ptolemy's argument with a hierarchised classification of consonances misplaced under the authority of Boethius:

> De primo sciendum quod 3 distinguit consonantias Boecius in Musica sua 7° capitulo. Quia sunt quedam consonantie perfecte sic[ut] dyapason et dupla dyapason, quedam medie sicut alie 3, scilicet dyatessaron, dyapente, dyapason cum dyapente, alie autem sunt consonantie imperfecte sicut tonus, ditonus et quedam alie.[25]

The hierarchical tripartition of consonances into perfect, medial and imperfect is nowhere to be found in the *De institutione musica*. However, it has some precedent in thirteenth-century

[23] See Walter Odington, *De speculatione musice*, ed. F. Hammond, *CSM* 14 ([Rome], 1970), 72-3; Jacobus Leodiensis, *Speculum musicae*, II, 108-110, pp. 248-257 and VII, 6-8, pp. 14-22; Johannes de Muris, *Musica Speculativa*, A, 216-218; B, 217-219; A/B, 226.

[24] 'Quando sunt due voces que vere consonantes faciunt quasi una vocula, si illis addatur vox tercia que consonet uni earum, ipsa consonabit et relique. Sed due voces sibi consonantes in dyapason sunt huiusmodi quod sunt quasi una vocula; ergo dyatessaron insuper additum superiori etiam consonabit inferiori in predictam prius proportionem.' (E369, fol. 124va). The author of the question relies here on Ptolemy's view as reported by Boethius, *De institutione musica*, V, 10, p. 360). See also the Ps-Aristotelian *Problemata*, XIX, 23 (919a7-8) where the lower note of the octave is said to be contained in the higher one.

[25] E369, fol. 124vb.

musica mensurabilis and *discantus* treatises. As Table 2 illustrates, the classification of consonances elaborated by the anonymous author bears similarities not only with the most widespread taxonomy of consonances available at the time, that of Johannes de Garlandia (*c*.1250), but also with the lists proposed by two other theorists active in Paris, Lambertus (*c*.1270) and Jacobus Leodiensis.[26]

	Johannes de Garlandia	**Lambertus**	**Jacobus Leodiensis**	**Anonymous Erfurt**
Concordantie/ consonantie perfecte[27]	unisonus diapason	diapason, duplus diapason	Unisonus, diapason, duplus diapason, diapason cum diapente, diapente, diatessaron	diapason, duplus diapason
Concordantie/ consonantie medie	diapente, diatessaron	diapente, diapente cum diapason	semiditonus, ditonus, tonus plus diapason	diatessaron, diapente, diapason cum diapente
Concordantie/ consonantie imperfecte	ditonus, semiditonus	diatesseron, diatessaron cum diapason	tonus, tonus plus diapente, semitonus plus diapason, ditonus plus diapason, diatessaron plus diapason	tonus, ditonus et 'quedam alie'

Table 2: Widespread Classifications of Consonances

Another interesting feature is the inclusion of the whole tone among the imperfect concords/consonances. Despite its being founded on a superparticular ratio (9:8), the Pythagorean tradition excluded the whole tone from the realm of consonance.[28] Apart from

[26] Johannes de Garlandia, *De mensurabili musica*, ed. E. Reimer (Wiesbaden, 1972), 68. One of the salient features of the Garlandian classification is the exclusion of all intervals larger than the octave on the grounds that they are simply 'reduplications' of smaller intervals. This classification enjoyed a wide diffusion through Franco of Cologne's *Ars cantus mensurabilis* (eds. G. Reaney and A. Gilles, *CSM* 18 [n.p., 1974], 64-68). It was still influential in Paris in the fourteenth century as indicated by the *Tractatus de consonantiis musicalibus* wrongly ascribed to Jacobus Leodiensis (eds. J. Smits van Waesberghe, E. Vetter and E. Visser, [Buren, 1988], 25) and by Henrich Eger von Kalkar's *Cantuagium* (ed. H. Hüschen, [Köln, 1952], 43). For Lambertus' classification see his *Ars musica*, F-Pn lat. 11266 (*c*.1280), fol. 12va. The Anonymous of St. Emmeram (1279) criticizes Lambertus for not using the Garlandian classification as a model (*De musica mensurata*, 262-4).

[27] For Johannes de Garlandia (*De mensurabili musica*, 67) the term 'consonance' stands for all musical interval whereas 'concordance' means 'duae voces iunguntur in eodem tempore, ita quod una vox potest compati cum alia secundum auditum'. Lambertus (*Tractatus de musica*, fol. 12va), in contrast, applies the terms consonance/dissonance to melodic intervals and concordance/discordance to harmonic intervals.

[28] Johannes de Muris (*Musica Speculativa*, A, 110; B, 111; A/B, 48) considers for instance the whole tone as 'part of a consonance'. This conception was already widespread in the twelfth century as William of Conches' *Glosae super Macrobium* attests: 'tractavit de consonantiis sonorum et de tono qui ut prediximus secundum Boethium non est consonantia sed pars consonantie.' (DK-Kk Gl. Kgl. S 1910 4°, fol. 105v). Another twelfth-century commentator on Macrobius draws an interesting analogy between the whole tone as constitutive of consonances and the syllable as composing words (the source of this analogy is Macrobius, II, 4, 5): 'Ut hic plane innuit tonus non debet vocari consonancia quia non est integrum nomen […] sed tonus facit cum alio

Jacobus Leodiensis who placed the whole tone among the concords precisely because it is founded on a superparticular ratio, almost all thirteenth-century and fourteenth-century music theorists unanimously arranged it among the discordances.[29] Such an inclusion of the whole tone can be explained by the fact that the anonymous author may have also had in mind the Ptolemaic classification of consonance expounded in Book V of the *De institutione musica*. In this passage, Ptolemy distinguishes the homophonic intervals (*aequisonae*) such as the octave and the double octave, the symphonic intervals (*consonae*) such as the fifth, the fourth, the twelfth and the eleventh, and finally the emmelic intervals such as the whole tone and several others. Thus the anonymous author might have conflated the classification of consonances of *musica mensurabilis* into 'perfect', 'medial' and 'imperfect' with Ptolemy's categories of intervals.

Now the matter is to determine which type of consonances, according to Ptolemy, can be heard as 'almost like one sound'. For the anonymous author the answer is simple: only the perfect consonances have the capacity to be added to any other interval without altering the latter's qualities. Indeed imperfect consonances sound too harsh on the ears to have this capacity.[30] Furthermore, when a medial consonance (i.e. the fifth and the fourth) is added to another medial consonance, the quality of the first interval is always altered.[31] For instance when a fifth is added to a fifth or a fourth to a fourth, the result is not a medial consonance but a dissonance:

> Si uni diatessaron alterum diatessaron superaddatur non consonabit [*ms.* consonabunt] ultimum primo, licet consonet medio, sicut patet dicendo 9 12 16,

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consonantia ut sillaba cum alia facit [nomen].' (Anonymus, *Commentum super Macrobium*, D-Mbs Clm. 14708, fol. 33rb). In his *Commentum super animam mundi*, Hisdosus envisions the tone as the 'principle' of consonances: 'Musice autem consonantie sunt V: diatessaron, diapente, diapason, [diapason] cai diapente, disdiapason. Tonus namque non est consonantia sed consonantiarum principium.' (F-Pn lat. 8624, fol. 24v).

[29] Jacobus Leodiensis, *Speculum musicae*, IV, 37, p. 100; Johannes de Garlandia, *De mensurabili musica*, 72; Franco of Cologne, *Ars cantus mensurabilis*, 66; Lambertus, *Tractatus de musica*, fol. 11rb. See also S. Fuller, '*Delectabatur in hoc auris*. Fourteenth-Century Perspectives on Aural Perception', *The Musical Quarterly*, 82/3 (1998), 472-3.

[30] 'Sed iste que inperfecte [sunt], modo dimittantur, quia tales offendunt auditum et non efficiuntur quasi una vocula.' (E369, fol. 124vb).

[31] 'Quia vox tercia addita duabus consonantibus vocibus [*ms.* consonantibus] consonantie medie non necessarie consonat in fine, postquam media subtracta [est].' (Ibid.).

> quia ultimum ad primum est superseptem partiens nonas, quod nullus ponit consonantiam [f125ra]. Item, si accipiantur duo diapente unum super alterum, ultimum non consonabit primo: verbi gratia, 4 6 9 erit ultimum ad primum duplam sesquiquartum, quod nullus ponit consonantiam. Patet ergo quod non est ratione consonantie simpliciter.[32]

However, there remains a problem. If only perfect consonances have a homophonic property, the anonymous author remarks, then Ptolemy has failed to include three more intervals among the consonances: double octave+fifth, double octave+fourth and triple octave. One could object that these large intervals have been excluded because on the one hand they exceed the sense of hearing and on the other hand they cannot be produced by the human voice.[33] This objection, as the anonymous author avers, can easily be invalidated. Indeed, some tone-deaf people do not even perceive a fourth or a fifth as consonant while others can hear dissonances larger than a double octave. Furthermore, in musical practice, the vocal or instrumental *ambitus* extends well beyond the double octave.[34]

Thus, for the anonymous author, Ptolemy's omission of larger consonances demonstrates that his argument for the inclusion of the eleventh - namely that the octave does not alter the qualities of the interval to which it is added - does not stand. No special

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[32] E369, fols. 124vb-125ra. It is noteworthy that Walter Odington (*De speculatione musica*, 73) uses the example of the superposition of the two fifths to invalidate a view that he ascribes to Ptolemy and according to which the mixture of two consonances never produces a dissonance.

[33] 'Ergo omnino sicut simplici dyapason addi possunt 3 alie, scilicet diapente quod facit triplam et diapason quod facit quadruplam et dyatessaron quod facit illa de quo est questio, omnino eodem modo supra dupla diapason addi possunt 3 alie: primo dyatessaron sicut 3 12 16 ubi ultimum ad primum est quadruplum sesquitercium, postea diapente sicut 3 12 18 ubi ultimum ad primum est sextuplum, postea dyapason sicut 3 12 24 ubi ultimum ad primum est octuplum. Sed has 3 consonantias nullus ponit, ergo nec illam quam Ptholomeus addit supra et ponenda est propter illam rationem quam ipse tangit. Nec potest dici quod ideo iste supra diapason duplam non sint consonantie quia auditus non possit in tanta distantia iudicare uel quia voces non se extendant in tantum' (E369, fol. 125ra). The limitation of the range of the human voice to two octaves can ultimately be traced back to Macrobius (*Commentarium in somnium Scipionis* II, 1, 24, p. 99). See for instance the remarks on this passage by William of Conches: 'Natura humane vocis non patiatur extendi ultra disdyapason […] consonantia adeo posset esse alta sed eam non comprehenderet humanus auditus quia ut nimius splendor confundit visum ita nimia altitudo consonantiarum confundit auditum.' (William of Conches, *Glosae super Macrobium*, fol. 106va).

[34] 'Multi enim sunt auditus qui nec dyapente nec dyatessaron iudicant esse consonantiam […]. Item, ultra duplam diapason bene auditus iudicat dissonantiam uel consonantiam […]. Item, multe voces humane non solum et [voces] organorum et instrumentorum, multum supra duplam dyapason se extendunt [*ms* excedunt].' (E369, fol. 125ra). Anonymous IV observes similarly: 'Ulteriori [sc. praeter bisdiapason] quidem processu quidam raro procedunt usque ad triplex diapason, quamvis in communi usu se habeat in instrumento organorum et ulterius aliorum instrumentorum.' (*Musica,* ed. F. Reckow, [Wiesbaden, 1967], 86). For Johannes de Garlandia (*De mensurabili musica*, 96), intervals above the double octave 'vix in opere ponuntur nisi in instrumentis'.

status should be allotted to the octave in judging the value of an interval. Rather, for the author of the Erfurt question, an interval is consonant 'absolute ex natura rei', and not because of the properties of its constituent parts.[35] Johannes de Muris also embraces a similar position affirming that in the primeval times, the '*natura rei*' of the consonances was revealed through experience.[36] This view is echoed in Jacobus Leodiensis' *Speculum musicae* but decked out with a more Aristotelian dress: for Jacobus, when two intervals are combined, the resulting interval is formally and essentially different from its parts which only exist *in potentia*.[37]

Now, in the language of Aristotelian ontology the 'nature of a thing' (*natura rei*) is equated to its substantial form, its quiddity.[38] According to the definition of consonance devised in the Arts faculty of Paris, the form of a musical interval is its constitutive ratio. Thus, the anonymous author posits ratio as the essential condition of consonance.

Faced with one such Pythagorean view which assigns the cause of consonance to immutable ratios, one may expect the Erfurt anonymous to cleave to the Pythagorean tradition and to reject altogether the eleventh on the grounds that it is neither founded on a multiple nor on a superparticular ratio. Surprisingly, the anonymous author does not embrace such an orthodox Pythagorean line of thinking. Rather, he takes a diametrically opposite tack and affirms with conviction that the eleventh is consonant *because* the ratio 8:3 generates a consonance.[39] Thus, not only does he reject Ptolemy's empirical view of the eleventh, but he also discards the rational beliefs of the Pythagoreans. Although he concedes that ratios are the causes of consonance, there is, for him, no limitation on the number of

[35] E369, fol. 125ra.
[36] *Musica Speculativa*, A, 116; B, 117; A/B, 58.
[37] *Speculum musicae*, II, 110, p. 253.
[38] See for instance Aristotle, *Metaphysics*, XII, 5 (1071a19-21). According to Thomas Aquinas: 'natura rei videtur esse substantia et hoc aliquid; natura autem rei est in quam terminatur naturalis generatio, idest forma, quae est quasi habitus quidam.' (*Sententia metaphysicae*, XII, 3, p. 691).
[39] 'Illa sixta [sc. diapason cum diatessaron] quam ponit Ptolomeus est proprie consonantie non hoc est ita quod diapason iugatur vox tercia tanquam uni vocula sed ita quod absolute dupla superbipartiens tercias consonantiam facit sicut sesquialtera uel dupla uel tripla.' (E369, fol. 125rb).

consonant intervals. In other words, there is no reason to apply the notion of consonance solely to the intervals generated by the tetractys as the Pythagoreans do.

In fact, for the anonymous author, many intervals, even those founded on irrational ratios (e.g. the ratio of the diagonal to the side of a square), can be numbered among the consonances. Like Grosseteste in his glosses on Boethius' *De institutione musica* and like Johannes Boen, the Erfurt anonymous introduces the notion of incommensurability into a music theory discussion. Both Boen and Grosseteste exclude incommensurability from the realm of music on epistemological grounds: music is subalternated to arithmetic and hence its object of study must remain confined to rational ratios expressible with numbers.[40] Embracing a different position, the Erfurt anonymous indicates in contrast that the musician ought to consider mixtures of sounds founded on irrational ratios. For him, these unheard intervals may even give more pleasure to the listener than the traditional consonances.[41]

To justify what may appear as an infinite extension of the realm of consonance, the anonymous author draws three examples from direct musical experiences. These three examples are worth a detailed analysis for they incidentally reveal fascinating information about contemporary musical practices.

In the first example, the anonymous author refers to *viella*-players (*vigellatores*) who invent many 'unusual' (*mirabiles*) consonances during their performances.[42] What are we then to make of these 'unusual consonances'? The Erfurt anonymous may refer to a particular tuning used by fiddlers to strategically narrow or widen selected intervals in order to enhance the emotional and aesthetic effectiveness of their musical performance. Or, he may simply allude to musical intervals which are either too small (i.e. microtonal) or too

[40] See above Chapter 2, 107.
[41] 'Sciendum est quod sicut in quantitate continua multe sunt proportiones mirabiles preter illas que sunt modo numeri, sicut patet de proportione diametri ad costam et omnium naturarum irrationalium de quibus tractatur loco geometrice, sic etiam in sono cum sit quid continuum et secundum mutationem alicuius continui mutetur secundum acutum et grave sicut patet in continua tensione corde […] multis rationibus dividi potest preter [illam] divisionem que modo numeri. Puto quod secundum istam divisionem sub ratione irrationali et surde linee multe ponuntur consonantie que latent artem musice et forte delectiores et magis delectabiles quam ille que sciuntur.' (E369, fol. 125rb).
[42] 'Unum signum quia vigellatores multum mirabiles aliquas invenerunt consonantias preter istas' (Ibid.).

large to be uttered by the human voice but which can be satisfactorily obtained on instruments.[43]

The second example adduced by the author of the question reveals that those who possess a natural and innate gift for singing (*cantantes naturaliter*) are able to elaborate consonances without knowing the rational foundations of the art (*ars*) of music. These singers intuitively and approximately produce consonances by adjusting, with their senses, the pitch of their voices rather than by counting, with their reason, the number of tones and semitones composing musical intervals.[44] Writing *c.*1330, the French music theorist Henricus Helene gives a similar description of singers with 'naturali industria nullius artis regulis edocti cantus quosdam dulcisones sibi formans participentes sine arte'.[45] With such an uninformed practice of singing based solely on *usus*, one may legitimately wonder about the kind of repertoire the naturally gifted singers were capable of performing. The anonymous author confines their competence to unmeasured musical compositions based on a simple melodic or harmonic texture.[46] In fact further precision can be gained from a passage of Johannes de Grocheio's *De musica*. At one point of his refined typological description of the Parisian musical repertoire *c.*1300, Grocheio opposes those who perform polyphony with art (that is by resorting to principles derived from music theory and mensural notation) to those who perform it by natural industriousness (*industria naturalis*) and exacting practice. Grocheio draws a link between these performers and certain unwritten polyphonic techniques such as 'fifthing', 'discant' and two-part organum.[47] One

[43] See for instance the remarks of Johannes de Muris about the enharmonic and chromatic melodic *genera* and their microtonal structures (notably quarter-tones): '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'. (*Musica speculativa*, A, 264; B,265; A/B, 292). On the same topic see also Jacobus Leodiensis, *Speculum musicae*, II, 61, p. 149.

[44] 'Aliud etiam signum quia cantantes naturaliter et non per artem frequentius inveniunt consonantes notas, magis secundum acutum et grave quam secundum numerationem toni et semitonii.' (E369, fol. 125rb).

[45] Henricus Helene, *Summula*, fol. 13v.

[46] 'Et hoc quilibet potest considerare quod tales etiam in simplici cantu multo delectabiliores quandoque faciunt cantus, non tamen secundum longum et breve sed secundum acutum et grave.' (E369, fol. 125rb).

[47] 'Quidam autem per experientiam attendentes ad consonantias tam perfectas quam imperfectas cantum ex duobus compositum invenerunt, quem 'quintum' et 'discantum' seu 'duplum organum' appelaverunt […] Sunt enim aliqui, qui ex industria naturali et per usum talem cantum cognoscunt et componere sciunt' (Johannes de

could identify the natural singers of the Erfurt question with these performers whose innate industriousness and intuitive knowledge of consonances allow them to master these rudimentary forms of polyphony which do not entail any knowledge of rhythmic notation and its intricacies.

Finally, the anonymous author of Erfurt introduces the example of expert (*experti*) English musicians. The achievement of these top-class insular performers does not lie in the craft of *musica mensurabilis* but rather in their capacity to mesmerize their audience with unheard-of, enchanting consonances that cannot be measured with tones and semitones.[48]

The term expert has to be understood in the context of Aristotelian natural philosophy. In the proem of his *Metaphysics*, Aristotle opposes the *expertus* or 'man of experience' whose knowledge is empirical and practical to the 'man of science' (*artifex*) whose knowledge is speculative and universal.[49] In the summary of this passage by Johannes de Muris, the expert becomes the one who only knows the 'what' (*quia*) of music without knowing the 'reason why' (*propter quid*). He is well versed in *musica practica* (plainsong and polyphony, oral or written) without knowing the universal rules of *musica speculativa* (i.e. consonance theory) and therefore he is not as wise as the *artifex* who applies his universal knowledge to the particular.[50] Thus, the English experts may be better described as experienced singers with undeniable and uncommon vocal abilities, as inspired and virtuoso performers with limited proficiency as theoreticians.[51]

Grocheio, *De musica,* 53). See also S. Fuller, 'Discant and the Theory of Fifthing', *AcM*, 50/1-2 (1978), 241-275.

[48] 'Tercium signum quia anglici prout communiter experti sunt, utuntur [*ms* utunt] quadam consonantia que nulla est de consuetudine [*ms* consuetudinis] nec numerare illam possunt secundum tonum et semitonium, que tamen multum est armonica et non offendens auditum.' (E369, fol. 125rb).

[49] See *Metaphysics*, I, 1 (981a24-30 and 981b30-32); *Auctoritates Aristotelis*, 1, 7.

[50] 'Experti enim ipsum quia sciunt, sed propter quid nesciunt. Non autem scientia faciunt, quae faciunt ut ignis exurit […] Ideoque artifices expertis sapientiores esse opinamur […] Igitur necessarium est in unaquaque arte habere primo theoricam, practicam convenienter, ut illud, quod scitum est in universali, ad singulare valeat applicari.' (Johannes de Muris, *Notitia artis musicae*, 47-8). For a detailed analysis of this passage see Haas, 'Studien', 395-8.

[51] See also the remarks of the author of the *Quatuor Principalia* (*c.*1350) for whom an expert singer is one who 'habens vocis habilitatem potest cum aliis habentibus habilitatem canendi, magnam facere melodiam.' (*Quatuor Principalia*, *CS*, 4, 294). Writing around the same time, the enigmatic theorist Arnulph of St.-Ghislain describes in his *Tractatulus de differentiis et gradibus cantorum* the naturally gifted and diligent

Now, it is very tempting to identify the wondrous 'unmeasured' consonances uttered by the expert English singers with microtonal intervals such as the variable-sized semitones described by the Northern Italian music theorist Marchettus of Padua in his *Lucidarium* (1309-1316).[52] Colouring the dissonances, these semitones were used not only for aesthetic reasons but also to enhance the sense of 'harmonic progression' and 'directed motion'.[53] One could also bring together the English singers and the siren-like female musicians placed at the vertex of Arnulf of Saint-Ghislain's pyramidal classification of performers who divide and subdivide tones and semitones into infinitesimal microtones leading their enchanted audiences to the threshold of voluptuousness.[54]

Clearly, the three examples advanced by the Erfurt anonymous to justify his extension of the realm of consonance have a common aim: to show that the determination of musical consonances is more an empirical issue than a theoretical one. The fact that the singers or instrumentalists described here intuitively produce consonant intervals, without the intellectual exertions demanded by speculative music theory, makes a strong case for the superiority of the practising musician over the theorist regarding consonances. *Usus* and sensory experience take precedence over rationality and *ars*. This position runs counter to the Pythagorean perspectives of Johannes de Muris or Jacobus Leodiensis who both censure

performers as 'totius artis musicalis expertes'. See the edition and English translation of the treatise by C. Page, 'A Treatise on Musicians from *c*.1400?: The *Tractatulus de differentiis et gradibus cantorum* by Arnulph of Saint-Ghislain', *JRMA*, 117/1 (1992), 16.

[52] Marchetto da Padova, *Lucidarium*, ed. J. Herlinger (Chicago, 1985), 132-160. For an assessment of the impact of Marchetto's theory on the musical practices of the *Trecento*, see J. Herlinger, 'Marchetto's Division of the Whole Tone', *JAMS*, 34 (1981), 193-216.

[53] As Marchetto states: 'Huiusmodi autem partes in tono, seu huiusmodi semitonia, fuerunt in musica adinventa, ut per dissonantias coloratas, seu cuiusdam pulcritudinis ipsarum, ad perfectiores, seu pulcriores, in cantu consonantias veniamus.' (*Lucidarium*, 136). On Marchetto's use of Aristotle's *Physics* to describe this direct motion from dissonance to consonance, see D. Cohen, '"The Imperfect Seeks its Perfection": Harmonic Progression, Directed Motion, and Aristotelian Physics', *Music Theory Spectrum*, 23/2 (2001), 1-25.

[54] Arnulph of St.-Ghislain, *Tractatulus*, 16. Many female vocalists or 'chanteresses' are documented at the courts of the Dukes of Bungundy and Berry in the second half of the fourteenth century. See C. Wright, *Music at the Court of Burgundy 1364-1419* (Henryville, 1979), 28-9; A. Pirro, *Histoire de la musique de la fin du XIV^e^ à la fin du XVI^e^* (Paris, 1940), 25.

performers for their intuitive and superficial knowledge of consonance and swear allegiance to Boethius by reasserting the primacy of intellectual understanding over sensation.[55]

The author of the Erfurt question substitutes an aesthetic bias to the rationalist bias of the Pythagoreans. Aural pleasure becomes the guide in distinguishing what is consonant from what is not. As long as an interval charms and allures the ear, it is deemed consonant. In other words, for the anonymous author, consonances are no more determined by any rational belief but rather by hearing. In accordance with the Aristotelian theory of knowledge, hearing and sense perception become the main criterion of judgement and discrimination, whereas rationalisation only comes *post factum*.[56] The Erfurt anonymous follows the same path as such a fervent advocate of aural experience as the Oxford-trained music theorist Johannes Boen who affirms that the *cantor* came before the *musicus* and that 'usus aurem prius certam esse de tono quam erat intellectus speculantis certus de toni proportione'.[57]

Thus, the boundaries of the realm of consonance are no longer as immutable as the numerical truth the Pythagoreans thought inherent in nature. For the anonymous author, they depend on the abilities of the performer and the sensory acuity of the listener. In fact, if performers had the most perfect technique and if listeners were equipped with the finest and most adept sense of hearing, then an infinite number of consonances would be in use.[58] Unfortunately, this is not the case. If the anonymous author does not expand on what this 'perfect technique' of the performer ought to be, he does maintain, relying on Aristotle, that

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[55] See the aforementioned introductory paragraphs of Johannes de Muris' *Notitia artis musice* (47-8) and also Jacobus Leodiensis: 'Usus enim et ars docuit quod sapit omnis homo maxime in practices […] unus cum arte musicae non modicum praebet experimentum ad securius et verius iudicandum communiter de consonantiis […]. Sed practici musici, solum usum habentes, etsi de his bene iudicent et prompte, causas tamen assignare nesciunt, nisi per artem invenitur.' (*Speculum musicae*, IV, 41, p. 106). Elsewhere Jacobus compares certain singers who sing polyphony only *per usum* to dogs howling and barking (*ad modum canis hawant et latrant*). See *Speculum musicae*, VII, 9, p. 23.

[56] 'Iudicium [de consonantiis] non est accipiendum ex ratione, sed magis ex sensu quia nondum est ita certa ratio communis ex natura rei quod consonet nota talis […] illam musica ulterius est considerativa.' (E369, fol. 125va). The complex links between judgement, reason and sense perception are broached in Aristotle *De anima*, III, 2 (425b11-427a15).

[57] Johannes Boen, *Ars (musicae)*, ed. A. Gallo, *CSM* 19 ([n.p.], 1972), 37.

[58] '[…] si ibi fuerint voces que erunt potentissime secundum acutum et grave, et auditus subtilissimus ad iudicandum, et ars perfecta ad depromendum, ideo omnium erit ibi usus.' (E369, fol. 125va).

hearing, like the other sensory organs, is limited by nature.[59] As a good Aristotelian, hearing is for him a passive, organic capacity, proportionally affected by its sense objects, namely sounds. Aural pleasure and hence consonance will only arise when the mixture of sounds sounds proportionate to the listener's ears.[60]

This very empirical and pragmatic view echoes the most widespread definition of concord found in numerous thirteenth- and fourteenth-century *musica mensurabilis* and discant treatises, that is, cast in terms of aural sensation: a concord occurs when two simultaneous dissimilar sounds 'se possunt compati secundum auditum'.[61] Because of musical or mathematical rationale, all these practical treatises remain, however, quite selective regarding which interval can be counted among the concords or consonances.[62] In contrast, for the Erfurt anonymous, because hearing is an organic capacity, subject to change, the number of consonances is not fixed by any *a priori* rational or practical rule. The ears are malleable. Not only is hearing receptive to different conventions of specific place and time but with training or habit, it possesses the capacity to assess and constantly modify degrees of consonance without the help of reason.[63]

To conclude, it seems obvious that throughout the question, the problem of the integration of the Ptolemaic *diapason cum diatessaron* within the traditional Pythagorean consonances was merely a pretext to tackle a larger issue: that of the very foundation of musical consonances. Are consonances actually determined by rationality and number

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[59] 'Sed forte auditus illas [sc. complexiones in vocibus] non potest distinguere, sicut nec tactus tales complexiones, nisi paucas, imprimere.' (Ibid.). The comparison of touch and hearing is drawn from Aristotle's *De sensu et sensato* (445b20ff).

[60] 'Si tamen proportio complexionis in vocibus secundum acutum et grave delectat secundum proportionem elementorum ad invicem in ipso audiente.' (E369, fols. 125rb-va). On this idea see Chapter 2, 140-141.

[61] Johannes de Garlandia, *De mensurabili musica*, 67. The probable source for such a definition is Boethius' *De institutione musica* I, 8 (p. 195). For several occurrences of this definition in thirteenth- and fourteenth-century music treatises and a thorough analysis of its implications for the debate on consonance, see Hentschel, *Sinnlichkeit*, 175-197.

[62] Apart from Jacobus Leodiensis who lists 15 concords used in discant, most discant and *musica mensurabilis* treatises limit the number of concords or consonance to six. For useful lists of consonances see the pioneering article by R. Crocker, 'Discant, Counterpoint and Harmony', *JAMS*, 15 (1962), 4-6.

[63] As the anonymous author states: 'vere consonantia absoluta natura rei est ista que facta in voce et in instrumento non offendit auditum postquam aliquis eam audit.' (E369, fol. 125va). Such a relavist position is echoed in Johannes Boen's comments (*De musica*, 76-77) about musical preferences of different people, regions and epochs.

theory or by affective aural sensation and a correlative aesthetic judgement? For the anonymous author, the answer is simple. He goes beyond the highly intellectualized Boethian Aristotelian definition of consonance (as an ontologically ambivalent object composed materially of sound and formally of number) devised in the Arts faculty of Paris. By disparaging the mathematical rationality at the heart of the Pythagorean theory of consonance, he equally calls into question the subalternation of music to arithmetic that was so instrumental in the epistemological definition of both sciences. Music is a science dealing with the continuum (i.e. sound) and as such it also depends on geometry. For an enthralled contemplation of the numerical truth that the Pythagoreans found inherent in nature, the anonymous author substitutes a partly innate and partly acquired musical sensitivity and receptivity, which evolves according to cultural conventions. This more empirical approach to music vividly glorifies performance, artistry and aural sensation, rather than intellectual speculation and sophistry, as the cause for musical delight.

The noblest branch of music

The second question of the Erfurt manuscript is not concerned with the theory of consonance but with *musica mensurabilis*. However, in contrast with the music tract known as Anonymous OP that will be analyzed below, the question of the Erfurt manuscript does not delve into the technicalities and intricacies of contemporary notational and mensural practices. More akin to the speculative tendencies of the Arts faculty, the issue at stake is the epistemological status of *musica mensurabilis*. The question gives an invaluable insight into how the developments of *musica mensurabilis* were perceived and incorporated within the framework of the Aristotelian definition of *musica* that had been devised during the debates of the Arts faculty.

Opposing that part of music which deals with the theory of consonances to another part of music which broaches the problem of time measurement, the anonymous author asks which of these musical sciences is the noblest:

> Utrum supposito quod duplex sit musica: una que est considerativa proportionis et quantitatis sonorum secundum acutum et grave quam tradit Boecius, alia que considerativa est quantitatis et proportionis sonorum secundum longum et breve que traditur a diversis cantoribus, querebatur tunc que istarum scientiarum musicalium esset nobilior et potior.[64]

The enduring antagonism between the *musicus* who attentively cultivates music's speculative gardens and the humble *cantor* who is involved in music making lurks behind this question. This is made clear as early as the opening of the question. The anonymous author opposes Boethius, the *musicus par excellence*, to various *cantores* concerned with musical time and notation. The whole question then consists in determining whether the science of the *musicus* is nobler than that of the *cantor*.

'Scientific nobility' is described here in strict Aristotelian terms. Restating the arguments set forth by Aristotle in the proem of his *Metaphysics*, the anonymous author maintains that speculative science is nobler than practical science for the latter implies a kind of usefulness directed towards an extrinsic end (action or production) whereas the former has its end in itself but is nonetheless useful to many other sciences.[65] The anonymous author also uses Aristotle's comparison between the dignity of a free man and the dignity of speculative science emancipated from the servile necessities imposed by external constraints.[66] The more speculative and less practical branch of *musica* will therefore also be the nobler.

Such an enthusiastic and ebullient embrace of the *bios theoretikos* – a supreme form of mental felicity reached through speculation and contemplation – echoes the artist's

[64] E369, fol. 125va.
[65] E369, fols. 125va-vb. See *Metaphysics*, I, 2 (982a2ff).
[66] *Metaphysics*, I, 1 (982b25-7); *Auctoritates Aristotelis*, 1, 22.

exaltation of philosophy and theoretical knowledge.[67] As the anonymous author asserts, only speculative knowledge participates in the 'perfecting of the intellect' and the attainment of the ultimate Good: 'Sed scire aliquam scientiam vere speculativam licet ad nihil aliud sit utile nisi ad totum bonum quod talis est perfectio intellectus.'[68]

In order to determine which branch of *musica* is nobler, the anonymous author sets forth five criteria borrowed from Aristotle's *Metaphysics*, *De anima* and *Posterior analytics*. A science is nobler than another if: 1) its observations are more certain; 2) its subject matter is higher in dignity and greater in wonderfulness; 3) it is speculative and not practical; 4) its objects are more universal; 5) and finally, if it deals not only with the fact (*quia*) but also with the 'reason why' (*propter quid*) of the phenomena it studies.[69] In short, the anonymous author intends to reinterpret in Aristotelian terms the relation between the quadrivial *musica* as described by Boethius and the practical *musica mensurabilis* by comparing their respective subject matters and methods. Such a confrontation has no other function than to demonstrate the superiority of the mathematical rule of the *musicus*-philosopher over the informed musical usages of the *cantor*-performer.

For the anonymous author, the subject matter of *musica* described by Boethius (i.e. the numerically expressible differences between high and low pitches) is nobler than the subject matter of *musica mensurabilis* (i.e. the durations of the notes).[70] One can indeed easily judge an interval to be consonant or dissonant. Such an appreciation is universal and immediately obvious because it is ultimately founded on the truthfulness and flawlessness of number, independently of the contingent physical qualities of vocal or instrumental

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[67] On the theoretical ideal fostered by the Arts faculty, see L. Bianchi, 'La felicità intellettuale come professione nella Parigi del duecento', *Rivista di filosofia*, 78/2 (1987), 181-201.
[68] E369, fol. 125vb.
[69] 'Dico ergo quod […] de nobilitate scientiarum duo tangit in principio De anima [I, 1 402a1-5] [ubi] dicitur "bonorum honorabilium, etc." que sunt maior de certitude et res nobilior et melior. Alia duo tangit in primo Metaphysice [I, 1 981b30-5] scilicet quia speculativa non practica et quia de magis mirabilibus et universalibus. Quintum vero tangit in primo Posteriorum [I, 14 79a17-24] quia nobilior est scientia que dicit de aliquo propter quid quam que dicit quia.' (E369, fol. 125vb).
[70] 'Nobilius aliquid et melius est totalis differentia vocis secundum acutum et grave quam protensio alicuius earum secundum longum et breve.' (Ibid.).

sound.[71] In contrast, comparing musical durations is not so straightforward. According to the anonymous author, knowledge about musical time-values can neither be universal nor obvious for it depends upon sensory perception and upon the vocal abilities of the singer.[72] Thus, because the objects of the Boethian science of music are ultimately founded on mathematical rationality rather than solely on aural experience like the objects of *musica mensurabilis*, the former science is nobler than the latter.

This statement is also true from the point of view of scientific method. As the anonymous author emphasizes, the science of music defined by Boethius is nobler because it is a purely speculative science. As such, it can equally be mastered by a trained singer and by a deaf-and-dumb person for it is solely based on intellectual understanding and does not entail any musical performance. *Musica mensurabilis*, he pursues, is in contrast a purely practical science which aims at the production of musical pieces. It only satisfies the senses and does not participate in the perfection of the intellect.[73]

Quite naturally then the practical branch of music is, for the anonymous author, subordinate to the speculative branch of music.[74] He introduces here the Aristotelian notion of subalternation by assigning the demonstration *propter quid* to speculative music and the demonstration *quia* to practical music. In as much as music is subalternated to arithmetic because the arithmetician explains the 'reason why' (*propter quid*) of musical phenomena, practical music is subalternated to speculative music. This position was common coin among the Parisian masters of Arts. Thomas Aquinas spoke of the subalternation of *musica*

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[71] 'Quod sit de certioribus et magis necessaris [*ms*. neccessaris] patet quia ille que secundum acutum et grave mensurantur non ad sensum sed ad certissimas proportiones numerorum, scilicet duplum, triplum, quadruplum, sesquialterum, sesquitercium, certissime et impermutabiliter se habent in quibuscumque sonis, vocibus uel instrumentis ponantur.' (Ibid.).

[72] 'Una vox protensa secundum tantum uel tantum tempus compatitur secum alias breviorum temporum nec videtur in hoc mirabile nec universale […] Illud autem quod secundum longum et breve mensuratur ad sensum secundum aptitudinem vocis quia habens vocem aptiorem unam longam frangit in plures breves, absque eo quod auditum offendat [*ms* ostendat], quam ille qui habet vocem minus aptam.' (Ibid.).

[73] 'Ista quae de acuto et gravi prout traditur a Boecio sit pure speculativa et aeque sciri possit a muto sicut ab optimo cantante, alia autem quae secundum longum et breve sit pure practica non perficiens intellectum sed magis delectans sensum.' (Ibid.).

[74] Immo ista que secundum longum et breve videtur ordinari ad illam que secundum acutum et grave inquantum est ordinativa affectionum impedientium speculationem et adunativa intentionis humane ad unum.' (E369, fol. 126rb).

practica which 'deals with sound through the experience of the ear' to *musica mathematica*.[75] Giles of Rome writing *c*.1280 described how the *musicus* could explain in a more subtle way what the *viellator* only grossly approached.[76] An anonymous commentary of the *Posterior Analytics* (*c*.1240) further specified that the *musicus* can explain the 'reason why' (*propter quid*) of musical euphony without knowing the 'fact' of the phenomenon (*quia*) nor how to play an instrument.[77] A similar line of reasoning led Robert Kilwardby to equate the musician knowing the 'reason why' to a *musicus mathematicus* and the musician knowing solely the fact to a *musicus mechanicus*, thus establishing a similar hierarchical relation between musical *ars* and *usus* as that existing between the liberal and the mechanical Arts.[78]

In the Erfurt question, the principle of subalternation is applied for the first time to the relation between speculative music and *musica mensurabilis*. The practitioner of *musica mensurabilis* empirically and intuitively coordinates the different voices of polyphony, guided only by aural affective sensation. His scope is limited to knowledge of the immediate fact (*quia*) of consonance. It is only through the rational knowledge of Boethian music theory that one will be able to explain the 'reason why' (*propter quid*) of the phenomenon.[79] Once again, such a relation of subalternation clearly marks the epistemological primacy, in the realm of music, of the speculative over the practical.

In sum, the vagueness of the terms related to the measurement of musical time indicates that the author of the questions has no technical knowledge of *musica mensurabilis*. He does not seem to be familiar with contemporary advances in the domain of

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[75] Thomas Aquinas, *Expositio libri Posteriorum*, I, 25, p. 91.
[76] Giles of Rome, *Expositio libri posteriorum*, fol. 47ra.
[77] 'Potest enim mathematicus musicus scire propter quid et causas eufonie, non tamen audivit viellare uel tympanizare. Unde scit propter quid sit euphonia, non tamen scit quia, et quod non audivit viellare hoc est a parte practice musice […] cum possumus cognoscere causas, non tamen applicando ad opus.' (Anonymous, *Commentum libri Posteriorum Analyticorum*, GB-Ob Canon Misc. 403, fol. 76vb).
[78] Robert Kilwardby, *De ortu scientiarum*, 60.
[79] 'Musica Boecii proportionem vocum secundum acutum et grave considerat per rationem dicentem propter quid, musica autem cantorum que secundum longum et breve tamen considerat quia in consonantia que [est] secundum acutum et grave, et accipit illam secundum experimentum et sensum.' (E369, fol. 125vb).

rhythmic notation. Johannes de Muris, for instance, attempted to devise a system to measure and notate musical time with greater precision than ever before. Such a system as codified in his *Notitia artis musicae* was founded on mathematical rationality and on number, two aspects that the anonymous author of the Erfurt question excluded from the realm of *musica mensurabilis*.

The most interesting aspect of the second Erfurt question lies in the anonymous author's attempt to integrate *musica mensurabilis* within the framework of Aristotelian epistemology. Using the rigid criteria which underpin Aristotle's hierarchy of sciences, the anonymous author reaffirms the superiority of Boethius' *musica* and its arithmetical speculations concerning consonance over the *cantores*' practical science of music and their concerns for the measurement of musical time. The practical knowledge of the performer of mensural music, based on usage and experience, is relegated in the background while the unflinching mathematical rationality of the theorist who knows the foundational principles of music shines forth. Such a subordination of *musica mensurabilis* to consonance theory represents a consensual opinion vigorously voiced by several fourteenth-century music theorists. For instance, Walter Odington and Johannes Muris organise their treatises by first explaining the most fundamental rule of speculative Boethian music theory before turning to practical matters concerning rhythmic notation.[80] Jacobus Leodiensis advises those who indulge in the useless sophistications of *ars nova* theory to concentrate their energy on the 'noble speculative music'.[81] The anonymous author of the second Erfurt question, however,

[80] As Muris specifies at the opening of his *Notitia artis musicae*: 'Nos autem propter bonum commune et ratione veritatis, quae diu latuit, ostendendae circa artem musicae proponimus vigilare, intendentes circa eam duo breviter enodare: primo theoricam, secundo practicam, cui non est inconveniens, quodammodo quamdam theoricam implicari.' (48). For similar remarks see also Walter Odington, *De speculatione musice*, 42

[81] 'Utinam studerent [sc. moderni] in nobili musica vere speculativa, ibi se fundarent, ibi se subtiliarent et musicam practicam non extra limites suos traherent!' (Jacobus Leodiensis, *Speculum musicae*, VII, 9, p. 25). Johannes de Grocheio also noted a tendency to focus on pratical matters and to neglect musical speculations: 'plures diebus istis practicam huius artis quaerant, pauci tamen de eius speculatione sunt curantes.' (*De musica*, 41)

is the first to redefine the relation between speculative music and *musica mensurabilis* in truly Aristotelian terms, as a case of subalternation.[82]

In addition, in considering speculations about the numerical nature of musical consonances as the higher form of musical knowledge, the anonymous author reaffirms the primacy of reason in musical discourse. He sanctions the domination of the *musicus* and glorifies the exertions of Pythagorean music theory. As a result, the craft of the *cantor* who engages in polyphony is depreciated and regarded as an empirical activity which does not play a role in the attainment of a supreme form of mental felicity. This view contrasts starkly with the one promoted in the first Erfurt question, which proclaims the debacle of Pythagorean rationalism, subdued by sensory perception and aesthetic pleasure. In contrast with the second question, the first puts the practitioner of music and his informed practical knowledge, or should we say *savoir-faire*, on a pedestal. Performers are praised for their artistry and their boldness. Unconstrained by the limitations of Pythagorean rationalism, they are encouraged to venture and manoeuvre as far as the realm of microtonal intervals to lure and ensnare the delighted ears of their audience. Mathematical justification does not matter. Sonority, aural pleasure and musical effects are the driving forces.

Such a sharp contrast between the two questions raises valid doubts about a single authorship. It is more likely that the two questions were composed by two different authors and incidentally put together by the scribe of the Erfurt manuscript. If we leave aside questions of authorship, the two Erfurt questions show how diverse opinions about the role of reason and sensation in music could emerge and coexist in the intellectual milieu of the Arts faculty of Paris.

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[82] Without referring to the theory of subalternation, Franco of Cologne describes *musica mensurabilis* as an auxiliary discipline (*subalterna*) to the main (*principalis*) discipline of *musica plana*: 'idcirco nos de mensurabili musica, quam ipsa plana praecedit tanquam principalis subalternam.' (Franco of Cologne, *Ars cantus mensurabilis*, 23). A similar idea is expressed by Henricus Helene: 'Tercia [sc. musica mellica] duplex invenitur scilicet plana et subalterna sive mensurabilis' (Henricus Helene, *Summula musicae*, fol. 13v). See also Aquinas' remarks about the subalternation of *musica practica* to *musica mathematica* in *Expositio libri Posteriorum*, I, 25, p. 92).

A Parisian list of music questions

Lawrence Gushee describes F-Pn lat. 7378A (hereafter P7378A) as 'the oldest collection – in date of copying – of so-called *ars nova* theory'.[83] P7378A is not only an important source for music theory but also for other quadrivial sciences (most notably Archimedean geometry, arithmetic and algorism) and *scientie medie* (astronomy, *perspectiva* and *scientia de ponderibus*).[84] Most of the manuscript, written by various hands, can indeed be dated around 1350. It has been argued that several parts are the work of a certain Nicolas Judeus, brother of the famous mathematician Thimon Judeus, active in the Arts faculty of Paris around 1350.[85] Despite this university connection, this manuscript does not contain any of the prescribed textbooks for the quadrivium. Most of the mathematical texts it transmits were in fact either composed or translated in the thirteenth and fourteenth centuries.[86] Although it is very difficult to ascertain the date when the different parts composing P7378A were bound together, this manuscript may well reflect the extracurricular interests of Parisian mathematicians who had received an Arts training around the middle of the fourteenth century. It should be noted that Johannes de Muris' *Musica speculativa* and the notational theory of the *ars nova* were among these interests.

The hitherto unpublished list of question-titles enunciating problems related to the three *scientie medie* (optics, mechanics and music) is written after an anonymous optical

[83] L. Gushee, 'New Sources for the Biography of Johannes de Muris', *JAMS*, 22 (1969), 6. This manuscript is notably the oldest known copy of the so-called B version of Johannes de Muris' *musica speculativa*, it also contains Johannes de Muris' *Notitia artis musicae*, Leo Hebraeus' *De numeris harmonicis*, a copy of Vitry's 'phantom treatise' *Ars nova* and an hitherto unpublished tripartite treatise (incipit: '*Omnes homines natura*') that may well be the work of Johannes de Muris.

[84] For a full description of the manuscript and its content see Johannes de Muris, *Notitia*, 24-31.

[85] D. Jacquart, 'Rapport de la Table ronde *Les disciplines du quadrivium*', in *EDFA*, 239-247. The copy of Domenicus de Clavaxio's *Geometria practica* transmitted in this manuscript bears the following colophon: 'Expliciunt practice geometrie ordinate per magistrum Dominicum de Mastmario de Clavaxio, complete penitus anno ab incarnatione Domini 1346, prima die maii, et scripte Parisius a Jacobo Lectoris Zeelandrino anno Domini 1362, mense iulii. Amen. Amen.' (P7378A, fol. 14r). It is noteworthy that Nicolas Iudeus' *Planisphaerium* is among the works transmitted in P7378A.

[86] In addition to the music treatises of Johannes de Muris, the manuscript also contains Petrus of Maricourt's *Epistola de magnete* (*c.*1260), Nicole Oresme' *Ad pauca respicientes* (*c.*1340), Domenicus de Clavaxio's *Geometria practica* (1346) or the *Pronosticationes super coniunctiones Saturni, Iovis et Martis* (1346) by Johannes de Muris, Firmin de Bellevale and the Provençal Jewish mathematician Gersonides.

treatise, in a cursive fourteenth-century script. It comprises 112 questions *de perspectiva* (fols. 83ra-84rb), 23 questions *de ponderibus* (fols. 84va-vb) and finally 37 questions *de musica* (fols. 85ra-rb), which will be of concern here. Because these questions are left undeveloped, it is impossible to determine whether the issues they cover were actually debated during formal or informal disputes or whether they simply reflect the specific interests of a scholar in the disciplines of optics, mechanics (*de ponderibus*) and music. Despite frustrating uncertainties regarding the function of this list of *scientie medie* questions, a closer examination of the music section is nonetheless revealing of the musical preoccupations of Parisian scholars in the second half of the fourteenth century:

[fol. 85ra]

[1] Utrum omnis angulus incidentie in sonis sit equalis angulo reflexionis
[2] Utrum soni frangantur sicud luces et colores occurentes [in] medio alterius diaffani
[3] Utrum soni alio modo multiplicentur quam luces et colores
[4] Utrum sit unum auditum ultimum sicut est unum visum
[5] Utrum soni in mediis que percurrunt possint permixteri
[6] Utrum soni possint intendi uel remitti in infinitum
[7] Utrum autem tres sint consonantie et non plures
[8] Utrum campane suspense supra aquas melius resonent
[9] Utrum dyapason sit consonantia perfectissima
[10] Utrum consonantie sint commensurabiles ad[87] invicem
[11] Utrum tonus possit mediari per equi[…][88]
[12] Utrum [tonus] possit mediari per monocordum
[13] Utrum comma aliquando sit maius aliquando minus
[14] Utrum divisio monochordi sit possibilis
[15] Utrum qualis proportio sonorum talis etiam sit cordarum
[16] Utrum fistule ad fistulam uel campane ad campanam sit proportio sicud sonorum inde provenientium
[17] Utrum soni sint proportionales suis motibus
[18] Utrum dyapason in motu celesti sit perfectissima consonantia
[19] Utrum tonus possit in proportione se haberi ut medium et [in] duo se dividi
[20] Utrum omnes consonantie possint fieri sumendo partes alias et dispersas
[21] Utrum consonantia possit fieri non consonantia
[22] Utrum non consonantia possit fieri consonantia

[87] ad] *ms* in.
[88] *lectio incerta*.

[fol. 85rb]

[23] Utrum qualis est proportio soni ad sonum talis sit proportio distancie ad distanciam quas soni percurrerunt
[24] Utrum dyapason, dyapente et diatessaron possint intendi ac remitti
[25] Utrum datis duobus sonis possit inveneri per aliquam artem proportio eorum ad [*ms*. in] invicem
[26] Utrum vere consonantie possint adtendi penes intensum et remissum, uel acutum et obtusum sicud adtendentur penes grave et acutum
[27] Utrum auditus fiat per pyramidem
[28] Utrum per plura obstacula voces reflexe possint echo auribus percipi
[29] Utrum dyapason componeatur ex dyapente et dyatessaron
[30] Utrum dyapason contineat in se 6 tonos precise
[31] Utrum dyapente contineat 3 tonos cum uno semitonio
[32] Utrum dyatessaron contineat duos tonos cum semitonio
[33] Utrum semitonium contentum in dyatessaron sit maius uel minus semitonio contento in dyapente
[34] Utrum omnes consonantie possint mediari
[35] Utrum si essent quattuor [*ms*. inferiori] soni quorum primus esset duplus ad alium, secundus duplus ad tertium, tertius duplus ad quartum, et primus esset voce gracibile grave, tota gravitas uel acutia possit vociferari
[36] Utrum si unisonus uniformiter in acute intendatur, dyapason, dyapente, dyatessaron, uniformiter uel difformiter adquirantur
[37] Utrum per concursum vocum uel sonorum possit fieri naturalis effectus sicud per concursum radiorum

In contrast with the introductory literature of the Arts faculty of Paris or with the musical questions uncovered in the Parisian Aristotelian commentaries, problems of classification, definition or epistemology receive no attention in this list. Clearly, the matter at hand is no more to delimit the position of music within the broader field of knowledge nor to define the discipline in accordance with the epistemological criteria expatiated by Aristotle. At the same time, the author of the list of questions betrays no interest in issues related to musical practice, related for instance to notation, rhythm or polyphony. In fact a great deal of the questions tackle typical problems of consonance theory that can be traced back to the Boethian tradition. The problem of the divisibility of the whole tone into two equal halves receives no less than three questions (qq. 11, 12 and 19). Several questions (qq. 20-22 and 29-33) are also devoted to the constitution, composition and combination of

consonances. Yet, a shift in orientation in the treatment of consonance theory is clearly noticeable.

Overall, the problems enunciated in the question list depart from the number-ridden discourse on consonance of the Boethian Pythagorean tradition perpetuated in the fourteenth century by authors like Johannes de Muris or Jacobus Leodiensis. As in the first Erfurt question, greater emphasis is put on consonance as a sounding phenomenon rather than as a ratio. This is probably why many questions cut across the firmly fixed boundaries established for music as a science subalternated to arithmetic in most of the late medieval hierarchised classifications of sciences. Instead of concentrating on computations and axiomatised demonstrations, the author of the question-list indulges in solving natural philosophy and general acoustic problems related to sound generation, sound propagation, hearing, or else, the phenomenon of echo.[89] As a result of this patent attention to the physical reality of sound and consonance, *musica* appears as an intermediate science less subalternated to arithmetic than to natural philosophy.[90]

The shift from a traditional arithmetical approach to *musica speculativa* to a more physically-oriented one becomes apparent in the question-list with the integration of the novel conceptual languages and problematics of the so-called 'new physics of the fourteenth century', which first developed in the 1320s in the milieu of Merton College, Oxford before reaching the continent around the middle of the century. According to John Murdoch the new physics of the fourteenth century is characterized by the elaboration of 'new conceptual languages with which to treat the traditional problems of natural philosophy on the one hand, and with which to invent and solve new problems on the other'.[91] The lion's share of

[89] See for instance, qq. 1-6, 8, 15-17, 23, 25, 27, 28 and 37.
[90] The subalternation of music to natural philosophy was a common position in Italy in the fourteenth century. For instance, the Paduan master Joachim de Parma states *c*.1350 that: 'musica est magis naturalis quam mathematica quia subalternatur naturali.' (*Questiones super librum Physicorum*, I-Rvat vat. lat. 3012, fol. 235ra). See also the first of the four anonymous fifteenth-century *Questiones in musica* transmitted in F-Pn 7392 (Panti, 'The first *Questio*', 294).
[91] J. Murdoch, 'Philosophy and the Enterprise of Science in the Later Middle Ages', in *The Interactions Between Science and Philosophy*, ed. Y. Elkana (Atlantic Highlands, 1974), 58. A detailed description of these

these new conceptual languages has to do with the measure and quantification of physical phenomena and more particularly of motion in all its varieties and circumstances.[92] Perhaps the two most universally applied of the new measure languages developed by the Oxonian masters are the language of *intensio* and *remissio* and the language of *proportio*.[93] Both of them found their way into the music questions of P7378A.

The dynamic notions of intensification (*intensio*) and remission (*remissio*) are instrumental to the mathematical description of processes of qualitative change. As a sensible quality, sound is subjected to the same mechanisms of qualitative change as colour or any other quality. Changes in sound can then be described as intensifications and remissions from one degree to another according to a certain velocity. It is therefore not incongruous to ask whether sounds can be subjected to infinite intensification or remission (q. 6).[94] Similarly, once envisioned as sounding phenomena and not as numerical abstractions, consonances can also be analysed in terms of *intensio* and *remissio*. Three questions of P7378A (qq. 24, 26 and 36) determine precisely if the differences between consonances are in fact qualitative differences in degrees and if through uniform or uneven processes of intensification and remission, a consonance can morph into another consonance.

Some questions listed in P7378A also make great use of the new measure language of *proportio*. A *proportio*, the Oxonian scholar Thomas Bradwardine writes, is 'a certain habitude of some things that are mutually comparable one to the other, for example of a number to a number, a magnitude to a magnitude, a sound to a sound, a time to a time, a

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new 'conceptual languages' is given in another momentous study by Murdoch, 'From Social to Intellectual Factors: An Aspect of the Unitary Character of Late Medieval Learning', in *The Cultural Context of Medieval Learning*, eds. J. Murdoch and E. Sylla (Dordrecht, 1975), 271-348.

[92] Murdoch, 'An Aspect', 279.

[93] For a succinct description see Murdoch, 'An Aspect', 281-6.

[94] The problem of *ad infinitum* processes of intensification and remission was a central one. See Murdoch, 'An Aspect', 303-306; J. Murdoch, 'Infinity and Continuity', in *Cambridge History of Later Medieval Philosophy*, eds. N. Kretzmann and *al*. (Cambridge, 1982), 576-80.

motion to a motion, a humour to a humour, a heat to a heat, a taste to a taste'.[95] Such a universal definition conflates the notion of numerical ratio dear to Pythagorean arithmetic and music, the Euclidian notion of *proportio* as defined in Books V and X of the *Elements* which included irrational ratios produced by the comparison of geometrical continua, and finally, the Aristotelian notion of mixture. *Proportio* becomes a mathematical tool employed to measure physical reality. When applied to *musica*, the notion of *proportio* helps to reintegrate the sounding dimension of the musical phenomena into an essentially arithmetical discourse based on ratio theory. In some questions listed in P7378A (qq. 15-7, 23 and 25), *proportio sonorum* indeed plays a central role in explaining how two sounds can blend together or in defining the relations between motion, velocity and pitch.[96]

In addition to the fathomable influence of the new physics, another interesting feature of the music questions of P7378A is the obvious correspondence established with the two other lists of questions on *perspectiva* and on the science of weight. Unfettered by the influence of arithmetic, *musica* can flirt with other *scientie medie* like the science of weight or *perspectiva*, which are more dependent on natural philosophy than on mathematics.[97] This strongly indicates that in the eyes of medieval scholars the three disciplines shared not only the same epistemological status as *scientie medie* but also a community of problems.

On the one hand, music is related to the science of weights through the concept of *proportio*. Indeed, nearly all twenty-three *questiones de ponderibus* of P7378A are precisely concerned with problems of proportions between weights, motions and uniform or uneven

[95] Thomas Bradwardine, *Geometria speculativa*, ed. and trans. G. Molland (Wiesbaden, 1989), 87.
[96] This concept was also used in early fourteenth-century commentaries on the *Physics*, see above Chapter 3, 181.
[97] For instance according to Blasius of Parma (*c*.1380), the *scientia de ponderibus* 'philosophie vere naturali dicitur subalternari' (see M. Clagett and E. Moody, *The Medieval Science of Weights*, [Madison, 1956], 231). In the thirteenth century, Robert Kilwardby, Johannes Pecham or Witelo placed *perspectiva* under the aegis of natural philosophy. This is also the case of Domenicus de Clivaxio who affirms in his *Questiones super perspectivam* (*c*.1350): 'cum perspectiva sit subalternata magis philosophie naturali quam geometrie, oportet in hac scientia probari non de lineis sed de radiis qui ad naturam pertinent.' (I-Fn Conv. Soppr J X 19, fol. 44r).

velocities.[98] On the other hand, correspondences between music and *perspectiva* are even more preponderant in P7378A. In several questions there are attempts to draw parallels between the mechanisms of hearing and of sound propagation and those of vision and of light propagation.

One question (q. 27) perplexingly asks whether the act of hearing is achieved by means of a pyramid (*per pyramidem*). This is a clear allusion to the Euclidian theory of the visual pyramid or visual cone whose base is the visible object and whose vertex is located in the centre of the crystalline humour of the eye.[99] The problem is also treated in one of the *questiones perspectivales* of P7378A and in Domenicus de Clivaxio's *Questiones super perspectivam*.[100]

Another music question (q. 3) addresses the problem of sound propagation in terms of the optical theory of the 'multiplication of species'.[101] Essentially, the theory of the multiplication of species conveys an emanationist conception of nature according to which all natural influences occur through the multiplication of species from an agent to a recipient. These species are like similitudes of the agent and they constitute the forces by which the latter acts upon its surroundings. Light and colour are visible and amenable instances of the emanation or multiplication of species. Yet for scholars like Roger Bacon, for instance, other percepts, such as sound, are also subject, though according to different modalities, to the contrivance of the multiplication of species.[102] It is therefore not

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[98] Take for instance the first three questions: 1) 'Utrum gravia sint proportionalia suis velocitatibus in descendendo'; 2) 'Utrum levia sint proportionalia suis velocitatibus in ascendendo'; 3) 'Utrum gravia uel levia sint proportionabilia suis sitibus.' (P7378A, fol. 85v). On the science of weights and its development in the thirteenth and fourteenth centuries see Clagett and Moody, *Science of Weights*, *passim*.

[99] On the fortune of Euclidian theory in the thirteenth century, see D. Lindberg, *Theories of Vision from Al-Kindi to Kepler* (Chicago, 1976), 11-4 and 104-7.

[100] 'Utrum visio fiat per pyramidem' (*questio perspectivalis* no. 73, P7378A, fol. 84rb). For Dominicus de Clivaxo, see the question 'Utrum visio fiat secundum piramidem cuius conus sit in centro visus et basis in superficie rei visae' (*Questiones super perspectivam*, fols. 51v-53r).

[101] For a clear analysis of the origins and the thirteenth-century developments of the theory of the multiplication of species (notably in the works of Robert Grosseteste and Roger Bacon), see D. Lindberg, 'introduction', in Roger Bacon, *De multiplicatione specierum*, ed. D. Lindberg (Oxford, 1983), xxii-lx; and also G. Federici Vescovini, *Studi sulla prospettiva medioevale* (Torino, 1975), 113-163.

[102] See for instance Bacon, *De multiplicatione specierum*, 20-3; and Id., *Perspectiva*, ed. D. Lindberg (Oxford, 1996), 112-115 and 140-143.

incongruous to probe, as the author of the Parisian question list does, for similarities or dissimilarities between the multiplication of sound species and the multiplication of light and colour species. This problem also attracted at least another Parisian scholar, roughly contemporary to P7378A, who wondered: 'utrum species soni multiplicentur per medium, an solum realiter an solum spiritualiter?'[103]

Finally, the links between music and *perspectiva* become even more conspicuous when typical optical problems about the refraction, diffraction and reflection of light rays are applied to sound. Duplicating one of the optic questions, the first music question explores the relation between the angle of incidence and the angle of reflection of a sound striking on a surface.[104] In the second music question, it is asked if the refraction of sound when passing from one medium to another is similar to the refraction of light and colour. The last music question invokes possible similitudes between the effects generated when two rays converge and when two sounds converge. The most direct consequence of such parallels established between light and sound is a geometrization of acoustic problems, which up until then had received in the Arts faculty but a cursory treatment relying essentially on Aristotle's *De anima* (II, 8) and its Arabic commentators.[105] Such a geometrical approach goes beyond the limitations of Aristotelian natural philosophy and its incapacity to fathom the complex physical reality of sound. It constitutes a first step towards a quantification of acoustic phenomena and hence a first step towards modern acoustics.

In short, the set of musical questions from P7378A evince a change of attitude towards *musica*. Questioning about music leaves the sphere of arithmetic and epistemology

[103] See the hitherto unnoticed set of questions on the multiplication of species transmitted in D-Kl, 2° Ms. Math. 31, fols. 17ra-19vb.
[104] This is the first of the *Questiones perspectivales*: 'Utrum omnis angulus incidentie sit equalis reflexionis' (P7378A, fol. 83ra).
[105] On the sources of Aristotle's theory of sound in *De anima*, II, 8 and for an analysis of Arabic commentators and of thirteenth- and fourteenth-century Latin commentaries on this passage, see M. Wittmann, *Vox atque sonus. Studien zur Rezeption der Aristotelischen Schrift De anima und ihre Bedeutung für die Musiktheorie* (Pfaffenweiler, 1987). See also the fine study by C. Burnett, 'Sound and its Perception in the Middle Ages', in *The Second Sense: Studies in Hearing and Musical Judgement from Antiquity to the Seventeenth Century*, eds. C. Burnett, M. Fend and P. Gouk (London, 1991), 43-71.

to enter the realm of natural philosophy. Acoustic questions about hearing and sound, which were the prerogative of the natural philosopher, become a privileged domain of inquiry for the *musicus*. In addition, enduring problems about consonances and their composition that lay at the heart of the Boethian-Pythagorean tradition, are no more addressed from a purely arithmetical standpoint but re-envisioned in their physical complexity. Consonances are conceived less as numerical ratios than as proportionate sounds subjected to general or specific natural laws that can be mathematically expressed with the help of the new measure languages of the fourteenth century. The question-list of P7378A indicates that *musica* did not escape 'the late medieval furor to measure', in John Murdoch's words, which metastasised like a proliferating cancer in almost all branches of knowledge.[106] In the Parisian question-list speculative discourse on music integrates the new conceptual languages of *intensio* and *remissio* or of *proportio* to treat the traditional problems of consonance theory or to invent new problematics focusing on the measure and explanation of acoustic and aural phenomena. Moreover, some questions establish parallelisms between music and two other *scientie medie*, the science of weight and *perspectiva*. In fact, the three sciences appear almost as a unified cycle of disciplines. They not only share a common status contrived from the fabric of Aristotelian epistemology but also the same endeavour to grasp and measure natural changes and motions. Flirting with *perspectiva* and the *scientia de ponderibus* and using the languages of the new physics, *musica* truly appears in the Parisian question-list as a *scientia media* grounded in natural philosophy and emancipated from the domination of arithmetic and from the constrained framework of the *quadrivium*. Whether such a new approach developed as part of official lectures on music at the Arts faculty of Paris or thanks to an individual or a group of individuals sharing similar extracurricular interests and intellectual curiosity is a question that must, unfortunately, remain in suspension.

[106] Murdoch, 'Philosophy', 64.

Music theory and the *questio*

Searching for *questiones* in thirteenth- and fourteenth-century Parisian practical music theory sources, whatever their main focus (chant theory or *musica mensurabilis*), is deceptive. Recent research has demonstrated that many music theory treatises of the period are studded with the terminological and methodological usages of scholasticism. Jeremy Yudkin tracked down such features in the *musica mensurabilis* treatises of the so-called 'School of Notre-Dame', that is, in an alleged chronological order, Johannes de Garlandia's *De mensurabili musica*, Lambertus' *Tractatus de musica*, the treatise of the Anonymous of St. Emmeram, Franco of Cologne' *Ars cantus mensurabilis* and finally, the treatise of Anonymous IV.[107] Joseph Dyer concentrated for his part on chant theory treatises such as Amerus' *Practica artis musicae* (1279), Elias Salomon's *Scientia artis musicae* (c1280), Egidius de Zamora's *Liber artis musicae* (1280) and Engelbert of Admont's *De Musica* (*c*.1310).[108] While marks of scholasticism are apparent in thirteenth- and fourteenth-century music theory treatises, the *questio* is seldom used as a form of discourse. Only very few music theorists interpolate truly dialectical questions in the fabric of their discourse.

Among the Parisian music theorists, the so-called Anonymous of St. Emmeram (1279) makes a particular use of the method of the *questio* to refute the notational views elaborated by Lambertus.[109] He devotes most notably a digression in *questio*-form to invalidate Lambertus' claim that a two-note ligature *cum opposita proprietate* can be indifferently perfect or imperfect: 'Utrum perfecta figurari debeat an etiam imperfecta, cum in ea usus contrarius habeatur?' The anonymous author first proposes two *pro* arguments (i.e. for the existence of a perfect two-note ligature) drawn from Lambertus' treatise. Then

[107] See most notably, J. Yudkin, 'The Influence of Aristotle on French University Music Texts', in *MTIS*, 173-189.
[108] J. Dyer, 'Chant Theory and Philosophy in the Late Thirteenth Century', in *Cantus Planus*, *4* (Budapest, 1992), 99-118. See also, L. Gushee 'Questions of Genre in Medieval Treatises on Music', in *Gattungen der Musik in Einzeldarstellungen*, eds. W. Arlt and al. (Bern, 1973), 423-5.
[109] See for instance Anonymous of St. Emmeram, *De musica mensurata*, 140 and 156.

he advances two *contra* arguments which represent his position. Finally, he concludes this short question by invalidating the two *pro* arguments, thus publicly (*publice*) criticising Lambertus' opinion. In short: for the Anonymous of St. Emmeram a descending two-note ligature *cum opposita proprietate* must always be represented as  and never as  , as stated in Lambertus' treatise.[110]

In his monumental *Speculum musicae*, Jacobus Leodiensis elaborates one question in order to disprove Johannes de Muris' very idiosyncratic view on the problem of the *diapason cum diatessaron*: 'Utrum diatessaron ante diapente sit consonantia?'[111] The discussion part of the *questio* is limited to a few lines and Jacobus indulges in a lengthy textual and philosophical analysis of the ontological nature of the eleventh. Jacobus also uses the *questio*-form on two other occasions to add complementary digressions to his already lengthy and comprehensive description of musical consonances: first he asks whether the unison can be termed a consonance and, then, whether there exist other consonances larger than three octaves and a fifth.[112] Here again the discussion is confined to one or two arguments and the emphasis is put on Jacobus' prolix and sometimes verbose *determinationes*. Finally, Book VII of the *Speculum musicae* contains numerous elements of the *questio* that Jacobus uses as a device to invalidate the new notational theories devised by the tenants of the *ars nova*. This is not surprising since Jacobus himself describes this last book as an *opus satiricus et disputativus*.[113] Thus, in Jacobus' treatise, the *questio* form looses its argumentative and dynamic structure and its nature as a means to juxtapose antagonistic opinions in order to attain a true statement.

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[110]Anonymous of St. Emmeram, *De musica mensurata,* 144-6. It is noteworthy that Lambertus' theory was perpetuated in early fourteenth-century England by frater Robertus de Brunham. According to the English music theorist Johannes Hanboys: 'Unde Robertus de Brunham posuit duas notas cum opposita proprietate, quarum secunda nota descendit quadrata […] nam vitiose ponitur quia contradicit regulas magistri Franchonis.' (Johannes Hanboys, *Summa*, ed. P. Lefferts [Lincoln, 1991], 286).

[111] *Speculum musicae*, VII, 6-8, pp. 14-22.

[112] 'Utrum unisonus sit consonantia' (*Speculum musicae*, II, 10, pp. 29-34); 'Utrum ultra dictas consonantias sint aliquae maioresque' (*Speculum musicae*, II, 126, pp. 301-303).

[113] *Speculum musicae*, VII, 1, p. 6. The satirical passages of the Book VII of Jacobus' *Speculum musicae* are analysed by F. Hentschel, 'Der Streit um die Ars nova – nur ein Scherz', *AfM*, 58/2 (2001), 110-130.

A more dialectical use of the *questio* features in Johannes Boen's *Ars musicae* (*c*.1360) but this time applied to *musica mensurabilis*. The Oxonian music theorist inserts four disputed questions in his theoretical narrative to pinpoint and explore in depth specific problems of mensural notation:

1) Utrumne [longa] per unam minimam adhuc valeat minorari?
2) Utrum due tertie per quas aliqua nota imperfecta est, valeant precise sub duobus corporibus figurari?
3) Circa alteratam notam queritur, utrum imperfici possit quoquomodo?
4) Utrum ergo pause imperfici alterarive possint videamus?[114]

The structure of these questions is relatively simple: Boen usually starts with the arguments contrary to his own position, and then he expounds his view sometimes with the backing of an authority. In these questions Boen focuses on two central notions of the *ars nova*: alteration (i.e. the doubling of a note-value to complete a ternary grouping) and above all imperfection (i.e. the taking away of up to one third of a ternary note). Coupled with a set of contextual rules, these notions enable a wide array of note-values to be derived unequivocally from just a few notated musical figures; the same figure could then be invested with a different value in different rhythmic contexts.

The practice of elucidating problems of *musica mensurabilis* is also attested in Italy around the end of the fourteenth century in an anonymous tract. The treatise is transmitted in the important *ars nova* source I-Rvat Barb. lat. 307, fols. 21r-27r and contains two short *questiones* on mensural notation as an appendix.[115] These questions delve into two typical problems of *musica mensurabilis* only cursorily touched on in the text: the problem of the alteration of rests ('questio de pausa: utrum possit alterari uel non?') and the problem of the imperfection of the minim ('questio de minima: utrum possit imperfici uel non?').[116] As in Boen's treatise, the questions are concerned with the general notions of alteration and imperfection. This may not be coincidental since, as Jacobus Leodiensis ironically

[114] Johannes Boen, *Ars [musicae]*, 22-29.
[115] See the edition in Anonymous, *De musica mensurabili*, ed. C. Sweeney, *CSM* 13 (n.p., 1971), 29-56.
[116] Anonymous, *De musica mensurabili,* 55-56.

interjects, not without exaggeration, imperfection was almost a compulsive 'obsession' for the *moderni*.[117] As we shall see below with the Anonymous OP and Johannes de Muris' *Notitia artis musicae*, this so-called obsession, which enabled greater rhythmic variety than ever before, also flourished among fourteenth-century Parisian music theorists.

Apart from these very few theorists who incorporate *questiones* in their discourse so as to vary and dynamise their arguments, three sources emerge from the mass of thirteenth- and fourteenth-century music theory writings as examples of music texts couched in *questio*-form. The first source was written in Avignon *c*.1350 by the Chaplain of Cardinal Johannes Colonna and friend of Petrarca, Ludovicus Sanctus de Beeringen.[118] In this short *sententia de musica sonora*, Ludovicus uses the *questio* as a literary device in the discussion of a very fashionable topic in university circles: the *subiectum* of music. Without going into details, the arguments adduced by Ludovicus to posit the *numerus ad sonum relatus* as the subject of *musica* are similar to those developed in the introductory literature of the Arts faculty of Paris one century earlier. The *sententia de musica sonora* demonstrates that in the fourteenth century epistemological questioning about music reached intellectual centres other than the universities and more particularly the Papal court.

The second source is more problematic. It consists of nine disparate questions, in a very simple dialectical form, patched together under the title *Argumenta musicae*. The *Argumenta* are, in the unique surviving manuscript copied in Ghent in 1503-4, erroneously ascribed to Johannes de Muris. The nine questions are concerned with *musica mensurabilis*, consonance theory and epistemology:

1) Queritur utrum aliqua figura potest ultra imperfici quam in tertia ejus parte?
2) Queritur utrum aliqua [nota] possit esse majoris valoris quam illa coram qua alteratur?

[117] 'Ars enim nova, sicut visum est, multiplicibus et variis utitur imperfectionibus […] quasi ubique imperfectio se ingerit […]. Nec sufficit Modernis perfectas imperficere et ad imperfectionem trahere. Quin immo! Et imperfectas, ut illis una non sufficiat imperfectio, sed plures!' (*Speculum musicae*, VII, 45, p. 87).

[118] The single fourteenth-century source for this treatise, I-Fl Ashburnham 1051, fol. 170r, is a musical compilation which once belonged to the Colonna family as indicated by a coat of arms on fol. 2r (three white cocks forming a triangle on a red background). The treatise is edited among others by H. Cochin 'Sur le Socrate de Pétrarque', *Mélanges d'archéologie et d'histoire*, 37 (1918-1919), 31-32.

3) Queritur utrum duplex longa alteratur?
4) Queritur si aliqua pausa mensurabilis potest esse plurium temporum quam trium?
5) Queritur utrum aliqua figura potest imperfici a parte ante coram sibi simili figura minoris vigoris?
6) Queritur utrum quarta sit consonantior quam tertia?
7) Queritur utrum longa potest imperfici a minima?
8) Queritur utrum musica sit scientia?
9) Queritur utrum numerus relatus ad sonum sit subjectum in musica?[119]

The questions on *musica mensurabilis* refer to certain notational theories developed by English theorists that circulated on the Continent only from 1330-1340 onwards: in question 4, the anonymous author assigns to some *novi magistri* a view which posits the existence of rests larger than *tempora* and in question 3, he mentions the extension of the *gradus*-theory to include values larger than nine breves.[120] Furthermore, the *Johannes de Velle* named in the first question alongside Philippe de Vitry and Franco may be identified with a music theorist who wrote a metric treatise on the church modes probably around the end of the fourteenth century.[121] These two pieces of evidence place the date of composition of questions 1-5 of the *Argumenta* at the earliest towards the end of the fourteenth century. The two epistemological questions (8 and 9) are more difficult to date but their connections with the university milieu are apparent. Not only do they broach issues that dominated the Arts faculty debates over music but they also present arguments commonly found in the introductory literature of Arts faculty of Paris (e.g. on the status of music as a science and on the *subiectum* of the discipline).[122] However, the copy date, the false ascription to Muris,

[119] B-Gu 70 (71), fols. 46va-48ra. The *Argumenta* are edited by Edmond de Coussemaker as part of a jumble of music theory entitled *Ars discantus* (*CS*, 3, 68-113). On the rejection of Muris' authorship of the *Argumenta*, see U. Michels, *Die Musiktraktate des Johannes de Muris* (Wiesbaden, 1970), 49.
[120] See fols. 46vb and 47ra; *CS*, 3, 108. On the particularly 'English' character of these two doctrines, see P. Lefferts 'An Anonymous Treatise of the Theory of Frater Robertus de Brunham', in *Quellen und Studien zur Musiktheorie des Mittelalters*, ed. M. Bernhard (Munich, 2001), 230-238.
[121] 'quia invenimus in Arte Franconis, et in tractatu Magistri Philippi de Vitriaco, et in Arte Johannis de Velle [ed. *CS*: Belle], et aliorum magistrorum […]' (*Argumenta*, fol. 46ra; *CS*, 3, 107). The treatise by Johannes de Velle is edited by E. Vetter in Anonymous, *Summula tractatus metricus de musica glossis commentarioque instructus* (Buren, 1988), 99-101. It is noteworthy that B-Gu 70 (71) contains on fols. 124r-134v excerpts of Johannes de Velle's metrical treatise integrated in a fifteenth-century Carthusian compilation of chant theory. See *Cuiusdam Cartusiensis monachi tractatus de musica plana*, ed. S. Lebedev (Tutzing, 2000).
[122] Compare for instance question 8 of the *Argumenta*: 'scientia est habitus congeneratus in anima nostra per demonstrationem ergo musica est scientia […] quia quidquid probat […] Boetius, probat per

a very corrupted text,[123] and the haphazard ordering of the questions make it difficult to bestow an authoritative status to this amorphous collectanea compiled at an indeterminate date.[124]

The third source takes us back to the Arts faculty of Paris in the fourteenth century and brings to the fore the problem of the relation between the University and the Parisian music circles which elaborated the new far-reaching codification of musical time and rhythmic notation of the *ars nova*. Probably written in Paris *c*.1320, the Anonymous OP is among the earliest theoretical sources for the French *ars nova* theory.[125] As Ulrich Michels observes, the anonymous author displays a good knowledge of some of the *ars nova* notational advances codified in Johannes de Muris' *Notitia artis musicae*: the minim; the *gradus*-theory according to which the relation between notes of adjacent value (long, breve, semibreve and minim) can either be binary or ternary; the *cantus regularis* and *irregularis* to describe instances when a piece begins and ends with the same signature or with a different one; and the *imperfectiones ad partes propinquas* and *ad partes remotas* according to which a perfect note (i.e. ternary) could be made imperfect by any smaller note-values (e.g. a long by a breve, semibreve or minim).[126]

The originality of Anonymous OP lies perhaps less in its doctrinal content than in its form, which differs in the two surviving fifteenth-century manuscripts of the treatise, GB-Ob Bodley 77, fols. 104r-105r (hereafter O) and F-Pn lat. 14741, fols. 5r-6r (hereafter P). P

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demonstrationem' (fol. 47vb; *CS*, 3, 108); with the question 39 ('Utrum musica sit scientia') of Radulphus Brito's *Questiones mathematicales* : 'Dicendum quod musica est scientia quia omnis habitus aggeneratus in nobis de aliquo scibili per propria eius principia est scientia, musica est huiusmodi, ergo etc.' (293).

[123] To mention just one example: copying question 8 (fol. 47vb; *CS*, 3, 109) from an older source, the scribe certainly misinterpreted the abbreviation 'Phi' introducing a quotation from Aristotle's *Metaphysics* II, 3 (995a14-5). He read 'Philippus de Vitriaco' instead of 'Philosophus'.

[124] This is also the opinion of Sarah Fuller, 'A Phantom Treatise of the Fourteenth Century: The Ars Nova', *JM*, 4/1 (1985-1986), 41-2.

[125] See U. Michels, 'Der Musiktraktat des Anonymus OP. Ein frühes Theoretiker-Zeugnis der Ars Nova', *AfMw*, 26/1 (1969), 49-50.

[126] For an analysis of the content of Anonymous OP in relation with Muris' *Notitia*, see Michels 'Musiktraktat', 51-55.

presents the text in the form of five *questiones* structured according to the model of the disputed question:

1) Queritur utrum punctus per sui addicionem possit causare breuem alterari?
2) Queritur utrum punctus positus inter duas semibreues positas inter duas breues […] faciat modi diuisionem?
3) Queritur utrum longa possit imperfici per breuem imperfectam per semibreuem imperfectam ex minima?
4) Queritur utrum longa possit imperfici per unam semibreuem?
5) Queritur utrum breuis possit imperfici per semibreuem?

The first question offers a good example of the dialectical structure used by Anonymous OP: 1) enunciation of the question: 'Utrum punctus per sui additionem possit facere brevem alterari?'; 2) two arguments *pro* set in a syllogistic form stating that the addition of a dot can alter a breve: 'Illud est causa alicuius […]. Item, per autores […].'; 3) three arguments *contra*: 'In oppositum arguitur: idem per idem […]. Item, omnis punctus significant […]. Item, non esset divisio modi […].'; 4) the minor premises of the two arguments *pro* are invalidated: 'Prima ratio solvitur, quia minor est falsa […]. Secunda ratio ponit minorem falsam […].'; 5) and finally the *determinatio* where the author adopts the position held in the *contra* arguments and adds examples to justify his claims: 'Oppinor ergo sic de questionis veritate […]. Exemplum ad praecedentia […].'[127]

While keeping most of the argumentative structure, the O version of the treatise omits the typical formulae of the *questio* and transforms the *questiones* into *conclusiones*.[128] It is possible to interpret this recasting of the treatise in a more axiomatic format as an updating, from the old *questio*-form to the more fashionable *conclusiones*, a trend also noticeable in contemporary scholastic commentaries.[129] Thus, P is probably closer than O to

[127] P, fol. 5r; O, 56-7 [the page number refers to Michels' edition of O in 'Anonymous OP', 56-62].
[128] For instance q. 1 in P: 'Utrum punctus per sui addicionem possit causare breuem alterari?' becomes in O 'Quod punctus per sui additionem possit facere brevem alterari'. Typical formulae of the disputed questions such as 'Et videtur quod sic', 'arguitur quod non', 'minor patet', 'maior patet', 'minor probatur', etc., are systematically omitted in O.
[129] On the emergence of *conclusiones* in fourteenth-century philosophical commentaries, see O. Weijers 'La structure des commentaires philosophiques à la faculté des Arts: quelques observations', in *Il commento filosofico nell'occidente latino*, eds. G. Fioravanti and *al*. (Turnhout, 2002), 36-39.

the original version of the treatise.[130] This simply implies that the Anonymous OP was originally written as a set of disputed questions on rhythmic notation.

The dialectical mode of the *questio* offers a means with which to juxtapose the innovations of the *ars nova* with the *ars vetus*. The anonymous author invalidates several arguments that can be traced back to the influential works of music theorists like Franco of Cologne or Petrus de Cruce.[131] During an age of transition, it was indeed important for the proponents of the new art of notating music to demonstrate the validity and the superiority of their theoretical choices over the established tradition. To make his demonstration more effective and compelling, the Anonymous OP not only confronted the *antiqui* with the spears of dialectic but he also incorporated in his argumentation the authoritative voice of Aristotelian philosophy to justify his theoretical choices.

For instance, the anonymous author uses the Aristotelian notion of 'accidental cause' to describe the role of the *punctus* in the process of alteration. According to Aristotle, an accidental attribute of a subject which is the immediate cause of X, can in virtue of its inherence in the subject be considered as an accidental cause of X. To give one example from Aristotle: Polyclitus and in another way a sculptor are the cause of a statue, because being Polyclitus and being a sculptor are accidentally conjoined.[132] Hence, according to Anonymous OP the dot is only an accidental cause of alteration because it is an accidental attribute of the figure to which it is appended. The immediate cause of the phenomenon of alteration is in fact the respective position and order of figures and notational signs.[133] Still on the same topic, the anonymous author also quotes verbatim an example from the *Physics*

[130] This is contrary to the opinion of Michels who unconvincingly affirms that P is an adaptation of O on the grounds that: 'Die Fassung O ist knapper[…] als P.' ('Anonymus OP', 55).
[131] The opinions of the *antiqui* are sometimes introduced by the formula 'per actores'. For instance: 'quia per actores punctus interpositus notularum significat perfeccionem precedentem' P, fol. 6r (O, 61). This is an allusion to Franco of Cologne: 'Nisi inter illas duas, scilicet longam et brevem, ponatur quidam tractulus qui signum perfectionis dicitur, […] et tunc longa prima perfecta est.' (*Ars cantus mensurabilis*, 32; in certain manuscripts 'signum' is replaced by 'punctus').
[132] See *Physics*, II, 3 (195a34-5).
[133] 'Punctus non est causa alterationis per se immediate et formaliter sed per accidens […], ordo et situs est causa per se alterationis.' (P, fol. 5r; O, 54).

where Aristotle describes how the same thing can be the cause of its contrary phenomena.[134] Such a definition indeed suits perfectly the *punctus* which, depending on the rhythmic context, can be responsible for the alteration or the removal of the alteration of a note.

Elsewhere, the anonymous author interprets the central *ars nova* notion of imperfection *a partibus remotis* (i.e. the imperfection of a L by a SB or by a M or of a B by a M) as a problem of the relation between a whole and its parts. For the Anonymous OP a long is made imperfect *a partibus remotis* by a semibreve in virtue of the breves that it contains *in potentia*. Underpinning this assumption is Aristotle's definition of a whole as a unity consisting of different parts. In virtue of this unity, any modification of the parts also leads to the modification of the whole.[135] This position is also adopted by Johannes de Muris in the fourth conclusion of his *Notitia artis musicae*.[136] It was later invalidated by Jacobus Leodiensis on the grounds that a whole cannot be made imperfect by its intrinsic parts. For Jacobus, imperfection implies action, and action implies contact. Because a whole and its parts are a unity, they are not in contact but rather they are one and the same thing and cannot act upon one another. Thus justification for the *imperfectio a partibus remotis* advanced by Anonymous OP and Johannes de Muris, is for Jacobus totally preposterous and founded on a misunderstanding of Aristotle's definition of the part-whole relationship.[137]

At any event, such recourses to the exertions of Aristotelian philosophy to explain the craft of music notation clearly connect the Anonymous OP to the milieu of the Arts faculty of Paris. It also reactivates the hypothesis of a link between the University and the developments of *musica mensurabilis*. May we then picture masters of Arts at the beginning of the fourteenth century debating such technicalities of *ars nova* notation as imperfection or

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[134] Compare Anonymous OP: 'plures cause per unum consensum bene causant effectum. Exemplum ad predicta: nauta per sui presenciam est causa salutis nauis, per sui absenciam est causa submersionis nauis' (P, fol. 5v; O, 56); and Aristotle's *Physics*: 'Quae enim praesens causa huius est, absentem causam aliquando contrarii; ut absentia gubernatoris navis submersionis cuius erat praesentia causa salutis.' (*Physica*, II, 3, 195a13-4; *translatio G. Moerbeke* in Thomas Aquinas, *Commentaria libros Physicorum*, 68).
[135] See P, fol. 6r; O, 62. See also Aristotle, *Metaphysics*, V, 26 (1023b33-35).
[136] See Johannes de Muris, *Notitia*, 93-4; and the analysis of this passage by D. Tanay, *Noting Music, Marking Culture: The Intellectual Context of Rhythmic Notation 1250-1400* (Holzgerlingen, 1999), 135-142.
[137] Jacobus Leodiensis, *Speculum musicae*, VII, 44, pp. 84-85.

alteration during extracurricular disputations? There are positive indications for such a possibility.

In his *Notitia artis musice* (1321), Johannes de Muris tells us that he inserted some *conclusiones* in his treatise to cut short the rising dispute (*orta disputatio*) around some of the innovations of the *ars nova*.[138] It may not be merely coincidental that eight out of the nine *conclusiones* of Johannes de Muris' *Notitia artis musicae* tackle issues related to imperfection and that two of them correspond to two questions of the Anonymous OP. It is perhaps in response to disputations about imperfection, of which the Anonymous OP would be a more or less faint echo, that Johannes de Muris grafted nine *conclusiones* to his manifesto for the new art.

Furthermore, Jacobus Leodiensis eloquently invokes the fact that his contemporaries had difficulties reaching a consensus on certain theoretical issues and lacked standardised and settled notational conventions.[139] The difficulty in reaching agreement among the *moderni* is also vividly evoked by Johannes de Muris. According to the young master, writing in 1321, the harsh disputes about the new notational signs, their shapes, significations and denominations, generated, almost on a daily basis, many a vexation among the contemporary Parisian *doctores musicae*.[140] In addition, this state of confusion was not solely confined to theoretical discourse but also affected musical practice.[141]

It is regrettable that Johannes de Muris did not further expand his laconic remark to give more precise clues concerning the social and intellectual milieus in which the polemicist 'doctors of music' evolved. Jacobus Leodiensis is also of no help here. Tracking

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[138] 'Inde est, quod nos amore ipsorum [sc. quamplurimi altercantes] magis quam veritatis aliquas conclusiones, super quibus nunc magis est orta disputatio, concinne volumus approbare' (Johannes de Muris, *Notitia*, 85). Eight of the nine conclusions are concerned with problems of imperfection. Jacobus Leodiensis systematically attacks the logical and semantic incongruities attached to the notion of imperfection as used by Muris in his *conclusions*. See *Speculum musicae*, VII, 38-44, pp. 75-85.

[139] 'Cum enim moderni doctores in tractatibus suis, quantum ad dictam artem, non satis sint concordes', (*Speculum musicae* VII, 48, p. 94). See also *Speculum musicae* VII, 24, p. 51 and VII, 34, p. 64.

[140] 'Restat quoque quibus figuris, signis, notulis que dicta sunt, convenienter debeant designari quibusque sermonibus uel vocibus appellari cum modo tempore nostro super hoc cotidie doctores musicae ad invicem convixantur.' (Johannes de Muris, *Notitia artis musicae*, 74).

[141] '[C]um de ipsa [sc. musica mensurabilis] diversi diversimode sentient practicantes.' (Ibid, 65).

down the sources in his *Speculum* rapidly turns into an impossible task, for Jacobus reports a myriad of opinions without distinguishing between direct quotations from treatises and personal recollections or experiences. Yet one remark in the *Notitia artis musicae* suggests that Johannes de Muris entertained a close friendship with and had a lot of respect for the Parisian *doctores musicae* for the inclusion of the final nine *conclusiones* in his treatise was prompted 'amore ipsorum magis quam veritatis'.[142] In addition, at the end of his *Notitia*, he addresses directly certain *venerabiles musici* that he had loved during all his youth for the sake of music, humbly asking them to correct his mistakes.[143] These *musici* clearly appear as Muris' masters to whom he is dedicating his treatise. They can also easily be identified with the *doctores musicae* mentioned earlier.

We know from Johannes de Muris' famous autograph list of book-loans transmitted in E-E O II 10 (fol. 125r) that he maintained an intellectual friendship with celebrated composers such as Philippe de Vitry and Denis Legrant.[144] Muris also dedicated his monumental *Quadripartitum numerorum* (*c*.1340) to Vitry.[145] It would be tempting to see the latter two prominent figures as two of the 'doctors of music' or 'venerable musicians' alluded to by Muris who engaged in the heated arguments about rhythmic notation. Although the early career of these two esteemed senior clerics is not known, it is possible that in the earlier days of their schooling they attended the Arts faculty of Paris. According to the hitherto overlooked testimony of Henrich Eger von Kalkar, who frequented the institution *c*.1355,[146] there were in Paris certain *magni artistae* whose names are listed in the 'musician motet' *Appolonis eclipsatur/ Zodiacum signis* who *c*.1330 devoted themselves to the study of *musica mensurabilis*.[147] The term 'magni artistae' indubitably refers to members

[142] Johannes de Muris, *Notitia artis musice*, 85.
[143] Ibid., 106
[144] L. Gushee, 'New Sources', 12; Id., 'Jehan de Muris and his Milieu', in *MuG*, 353-59.
[145] Johannes de Muris, *Quadripartitum numerorum*, ed. G. L'Huillier (Paris, 1990), 39.
[146] See *AUP*, I, 178.
[147] '[I]deo quidam magni artistae Parisius, quorum nomina in quodam discantu ponuntur, qui incipit "Zodiacus" […], circa annum videlicet Domini millesimum trecentesimum tricesimum, specialiter dederunt se

of Arts faculty of Paris and it is not coincidental that the first names which appear in the motet are those of Johannes de Muris, Philippe de Vitry and Denis Legrant.[148]

In fact, Henrich's testimony clearly indicates that Vitry and Legrant were Parisian masters, a connection between the two composers and the Arts faculty that had up to now remained hypothetical. Furthermore, thanks to this piece of evidence, the 'doctors of music' alluded to by Johannes de Muris may then be relocated among the population of the University and the *Notitia artis musicae* may be seen as a response by a young master to his peers about contemporary debates on measured music.

The idea of 'an invisible college' of musicians recently evoked by Lawrence Gushee to qualify the relation between Johannes de Muris and the many individuals to whom he lent books may also come to mind here.[149] We could well imagine more theoretical counterparts to the gatherings of *literati* musicians performing motets described by Jacobus Leodiensis and Johannes de Grocheio.[150] Sessions might have been organised where both performers and non-performers, coming from different social and professional milieux but all members of the same 'invisible college' of music-lovers and musicians, could have polemicised on the codification of rhythmic notation. At any event, these elective groups of musicians who discussed the technicalities of *musica mensurabilis*, from the more conservative advocates of the old notational practices to the various partisans of the *via moderna*, certainly counted within their ranks former or current students of the Arts faculty of Paris. Johannes de Muris, a mathematician, astronomer, music theorist and perhaps also composer,[151] Philippe de Vitry, a poet, music theorist and composer, and Denis Legrant, a poet and composer,

musicae certis mensuris temporum ipsam regulantes sub notis quadratis et quadrangulis, simplicibus et colligatis punctis etiam et pausis.' (Henricus Eger von Kalkar, *Cantuagium*, 44-5).

[148] See the edition of the motet by M. Bent, *Two Fourteenth-Century Motets in Praise of Music* (Devon, 1986).

[149] Gushee, 'Jehan de Muris', 339.

[150] Jacobus Leodiensis, *Speculum musicae*, VII, 48, p. 95; Johannes de Grocheio, *Musica*, 56. For a revised interpretation of this latter passage see M. Bent, 'Élite culturali e polifonia fra Tre e Quattrocento', in *Enciclopedia della musica*, eds. J.-J Nattiez and *al.* (Turin, 2004), IV, 210-211.

[151] On Johannes de Muris as a composer see Di Bacco, *De Muris*, 33-34.

frequented actively this circle of learned musicians. They were probably not the only ones from this institution to engage in advanced musical studies.

As a final remark it should be noted that technical squabbles about semiotic aspects of musical notation were probably not confined to the lofty academic circles. Talking about the minim rests, the music theorist Petrus de Sancto Dionysio observes that this topic 'generates today much debate among our musicians'.[152] The vague expression 'our musicians' gains its full meaning with a foray into Petrus de Sancto Dionysio's biography. Contrary to what has been assumed, Petrus was not a monk at the Royal monastery of St Denis near Paris. Rather, several pieces of evidence suggest that he is to be identified with the Austin friar Petrus de Sancto Dionysio, who was master regent in theology in Paris from 1305 to *c.*1330.[153] Firstly, Petrus incorporates in his *Tractatus* a few quotations from the works of Augustine tellingly called, on one occasion, *pater noster*.[154] Secondly, two of the three extant manuscripts of the treatise were copied in northern Italian Augustinian convents.[155] Finally, Petrus is praised in the triplum of the four-part 'musician motet' *Alma polis/Axe poli* composed in honour of the musicians of the Augustinian Order by Gilles d'Orléans and J. de Porta, two Augustinian friars active at the papal *curia* at the end of the fourteenth century.[156]

Hence the expression 'our musicians' used by Petrus de Sancto Dionysio clearly refers to the musicians of his Order, some of whom are probably also exalted in the *Alma polis* motet. Therefore, it would seem that the notational innovations of the *ars nova* also

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[152] 'Magna alter[c]atio versatur hodie inter musicos nostros quibus dicentibus, quod non sit dare pausam minimam.' (Petrus de Sancto Dionysio, *Tractatus de musica*, ed. U. Michels, *CSM* 17 [Rome, 1972], 155).
[153] For a short biographical notice on Petrus de Sancto Dionysio, see W. Courtenay, *Parisian Scholars in the Early Fourteenth Century* (Cambridge, 1999), 201-202.
[154] Petrus de Sancto Dionysio, *Tractatus*, 147-148 and 151-152.
[155] US-Cn MS 54.1, fols. 1r-6v copied in 1391 by frater G. de Anglia in Pavia, a city which hosted one of the most important Italian Augustinian convents; US-Wc ML 171 JC Case, fols. 102v-109r, copied between 1465-1477 by Franciscus Praeottoni, friar at the Augustinian convent in Venice.
[156] 'breviter ex quis modulo/ P. de Sancto Dionisio.' (*Alma polis*, vv. 10-11). This motet is transmitted in F-CH 564, fols. 67v-68r, see the edition and commentary by Ursula Gunther, *The Motets of the Manuscripts Chantilly, Musée Condé, 564 (olim 1047) and Modena, Biblioteca Estense, a M. 5,24 (olim lat. 568)* ([n.p.], 1965), xlii-lv and 40-5.

instigated passionate polemical discussions within the walls of Augustinian convents. This might also have been the case in the houses of other monastic orders. Indeed we know of several friars displaying a keen interest and expertise in *musica mensurabilis*: the mysterious English friar Robert Brunham whose doctrines on rhythm are reported in Robertus de Handlo's *Summa*; the enigmatic Anonymous IV who was probably a Benedictine monk at Bury St Edmunds; another Benedictine, Walter Odington, prior at Evesham Abbey; the Franciscan John Tewkesbury, author of the important *Quattuor principalia*; and the Cistercian Petrus de Palma Ociosa who wrote his treatise (1336) for the youth of his monastery in Cherlieu in the diocese of Amiens. Margaret Bent noted that the members of Italian monastic orders were prominent in the dissemination and the cultivation of renaissance art polyphony.[157] Perhaps, already in fourteenth-century France, the same monastic orders played a more important role than suspected in the debates that yielded the momentous notational developments of the *ars nova*.

Conclusion

The music questions uncovered and analysed in the present chapter represent only a very small part of what has survived the vicissitudes of history and an infinitesimal part of what was orally devised and never recorded. They represent the few remaining disparate fragments of a now lost mosaic of scholarly voices which emerges from behind the institutional scrim of the Arts faculty of Paris. It is difficult to determine if these music questions should be considered as reflections of oral disputations or if they simply belong to the genre of the *questio disputata* where an author would call on the dialectical method to explore a particular issue in writing. In other words, some of these questions may be the

[157] M. Bent, 'The Definition of Simple Polyphony. Some Questions', in *Le polifonie primitive in Friuli e in Europa*, eds. C. Corsi and P. Petrobelli (Roma, 1989), 41-42.

offshoot of passionate and ebullient debates pursued electively in small groups of scholars, while others may simply reflect the interests of one particular individual. Whatever their origins, these music questions can still be envisioned as distant and muffled echoes of music teaching. They indicate that a wide range of discussions about music as an intellectual discipline and as an art flourished on the margins of the official curriculum. Thus, for certain masters and students of the Arts faculty, the study of music was confined neither to solving problems of classification and epistemology nor to the exegesis of the texts prescribed for the examinations.

The author of the first Erfurt question used the classical problem of the eleventh to propose a redefinition of musical consonance. By including the eleventh among the consonances, he directly attacked the Pythagorean tradition that also persisted in the artists' definition of consonance as an ontologically ambivalent object composed of a numerical form and a sounding matter. For him, any mixture of simultaneous sounds, as long as it is pleasant to the ears and irrespective of its constitutive ratio, could be included among musical consonances. Freeing musical judgement from the shackles of Pythagorean mathematical rationality, the anonymous author deemed aural affections and aesthetic pleasure the essential criteria for the determination of musical consonance.

In the second Erfurt question, the focus shifted to that branch of music that dominated contemporary praxis-oriented musical discussions, namely *musica mensurabilis*. For the first time, the branch of music dealing with the measurement and notation of musical time, which had up until then been placed outside the realm of the *musica*,[158] was redefined in Aristotelian terms and tentatively reintegrated. As a science practised by *cantores*, that is oriented *ad opus*, *musica mensurabilis* was subalternated to the noblest science of music, the speculative *musica* of the *musicus*-philosopher who contemplates the universal truths of consonance theory.

[158] See for instance the famous remarks in the *Compendium of Barcelona*: 'musicus abstrahit penitus puros tonos et melodias a tempore in quo fiunt, et ideo de tempore non agit.' (§ 57, 46).

With the list of music questions in P7378A, a constellation of problems, earlier considered the prerogative of the natural philosopher (i.e. general acoustic problems on sound generation, propagation or on hearing), became of primary concern. Divorced from arithmetic and the old *quadrivium*, music truly affirmed itself as a *scientia media*. As such, it found new affinities with two extracurricular *scientie medie*, namely *perspectiva* (optics) and the *scientia de ponderibus* (static and dynamic). Flirting with natural philosophy, *musica* did not resist the advent of the new measure languages of the fourteenth century; an encounter which generated on the one hand new problematics and on the other hand new ways to envision traditional issues regarding consonances. That P7378A also contained, amidst numerous mathematical tracts, treatises on the *ars nova* theory suggests that at least some members of the Arts faculty counted *musica mensurabilis* among their extracurricular interests.

With the Anonymous OP, such an interest in *musica mensurabilis* was openly manifested. Questioning about music left the sphere of *musica speculativa* to delve into the intricacies and technicalities of the new manner of notating and measuring musical time that emerged in the early years of the fourteenth century. The Anonymous OP exemplified the intellectual challenge which was bound, perhaps from the start, to this *ars nova*. But more importantly, the treatise forcefully posed the paramount questions of the institutional and extra-institutional contexts which fostered the emergence and advances of *musica mensurabilis* and of the role played by the University and its intellectual orientations in such developments. These questions probably admit no definitive answers, yet they may reveal a new facet of the teaching of music at the Arts faculty of Paris worth further exploration.

CHAPTER 5

POLYPHONY, *MUSICA MENSURABILIS* AND THE ARTS FACULTY

Determining the exact role played in the thirteenth and early fourteenth centuries by the Arts faculty of Paris in the developments of polyphony and of *musica mensurabilis*, that branch of music concerned with the notation and codification of musical time, is no easy puzzle. We have seen that only the study of speculative music theory was part of the curriculum. We have also seen that this teaching focused, in general, less on closely commentating on the text-book of the discipline, namely the first two books of Boethius' *De institutione musica*, than on redefining the discipline, its subject and its principles by mingling elements of Boethian music theory with Aristotelian epistemology and natural philosophy. While the debates in the Arts faculty contributed to shaping a definition of *musica* that was to last for centuries, they suppressed references and issues related to the practical aspects of music and more particularly to *musica mensurabilis*.

Yet, music scholars have always sought to establish institutional or intellectual connections between the University and the unprecedented advances that took place at that time in the domain of rhythmic notation. To do so, they developed two strategies of research determined to some extant by the lack of direct and undisputed evidence of such connections. First, they assumed that liturgical or recreational polyphony was *de facto* the inevitable concomitant of university life. Ferreting out hints, mentions and descriptions of students and masters engaged in music-making or in the teaching of music theory, is for them sufficient to place the Arts faculty at the centre of the Parisian musical scene and of the momentous developments of *musica mensurabilis*.[1]

[1] See notably the evidence gathered by A. Pirro, 'L'enseignement de la musique aux universités françaises', *Mitteilungen der Internationalen Gesellschaft für Musikwissenschaft*, 2 (1930), 26-32 and 3 (1931), 45-56. See also, N. C. Carpenter, *Music in the Medieval and Renaissance Universities* (Norman, 1958), 48-69, 141-143 and 327-29.

The second strategy of research implies turning away from indirect evidence about the practice of polyphony to the *musica mensurabilis* treatises. Because a majority of these treatises on rhythmic notation are directly linked to Paris, modem scholars have attempted to relocate them within the intellectual context of the University by finding in the treatises superficial or more profound references to the dominant philosophical paradigm in the institution namely, Aristotelianism. Such reference helped scholars to envision *musica mensurabilis* treatises as traces of an 'informal teaching' on rhythmic notation that would have been carried out on the margins of the Arts faculty by and for elective members of this institution.[2]

The present chapter aims to assess the validity of these two strategies. The first part of this chapter will be devoted to the questions of whether polyphony was part of university life and hence whether its practice and instruction was fostered by the Arts faculty. As a religious institution, the University followed a carefully charted liturgical calendar scheduling celebrations of the Divine Office, processions, festivals and memorials throughout the year. Since this liturgy has hitherto never been analysed in detail, it will be interesting to attempt a reconstruction and see whether it prompted university authorities to establish a complementary training in the practice of polyphony for the congregation of masters and students. In addition, in thirteenth- and fourteenth-century Paris there flourished a new type of university-related educational institution, namely the college. Music historians have often affirmed that Parisian colleges ought to be considered as prominent centres

[2] See M. Haas, 'Studien zur mittelalterlichen Musiklehre I: Eine Übersicht über die Musiklehre im Kontext der Philosophie des 13. und frühen 14. Jahrhunderts', *Forum Musicologicum*, 3 (1982), 370-426; F. Della Seta, '*Utrum musica tempore mensuretur continuo, an discreto*: premesse filosofiche ad una controversia del gusto musicale', *Studi Musicali*, 13 (1984), 169-219; E. Fladt, *Die Musikauffassung des Johannes de Grocheo im Kontext der hochmittelalterlichen Aristoteles-Rezeption* (Munich-Salzburg, 1987); N. van Deusen, *The Harp and the Soul* (Lewinston, 1989), 256-278; J. Yudkin, 'The Influence of Aristotle on French University Music Texts', in *MTIS*, 173-189; D. Tanay, *Noting Music, Marking Culture: The Intellectual Context of Rhythmic Notation 1250-1400* (Holzgerlingen, 1999); F. Hentschel, *Sinnlichkeit und Vernunft in der mittelalterlichen Musiktheorie* (Stuttgart, 2000), 156-174.

where polyphony was cultivated, performed and even taught.[3] Yet musical life and instruction in colleges is still a *terra incognita*. Such an unknown territory will be explored here with the help of the statutory documents and hitherto unpublished financial records from Parisian colleges. Finally, Max Haas emphasized that practical instruction in *musica mensurabilis* was carried out at an elementary stage of education prior to higher studies in the Arts faculty.[4] However, his dossier lies conspicuously bare. Such a hypothesis deserves further investigation, for its validity will cast a different light on the role played by the Arts faculty of Paris in the practice and theory of measured music.

The second part of the present chapter is devoted to the second strategy outlined above. The previous chapter raised the possibility that Parisian Arts students and masters could have discussed technical problems of rhythmic notation during disputation sessions. The real challenge will now be to determine to what extent the philosophical debates in the Arts faculty of Paris, largely based on the exploration of concepts and issues drawn from Aristotelian logic and natural philosophy, had any influence on the contemporary upheavals in the domain of rhythmic notation. Such an inquiry will help demonstrate whether the *musica mensurabilis* treatises which grew and flourished in Paris in the thirteenth and early fourteenth century can be seen as direct emanations from university circles and, even, as vestiges of lectures *ex cathedra* on the notation and practice of measured music. Concentrating on a cluster of five treatises written in Paris during the second half of the thirteenth century, we will assess the nature and impact of the philosophical import in these texts which first codified the principles of *musica mensurabilis*.

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[3] See notably H. Husmann, 'The Enlargement of the Magnus liber organi and the Churches St Germain l'Auxerrois and Ste Geneviève-du-Mont', *JAMS*, 16/2 (1963), 186; A. Gilles, 'Contributions à un inventaire analytique des manuscrits intéressant l'ars nova de Philippe de Vitry', *RBM*, 10 (1956), 151; S. Fuller, 'A Phantom Treatise of the Fourteenth Century? The Ars nova', *JM*, 4/1 (1985-6), 46; M. Huglo, 'Recherches sur la personne et l'oeuvre de Francon', *AM*, 57/1 (1999), 15; Haas, 'Studien', 370.

[4] See Haas, 'Studien', 368-69; Id., 'Die Musiklehre im 13. Jahrhundert von Johannes de Garlandia bis Franco', in *Die mittelalterliche Lehre von der Mehrstimmigkeit*, eds. H.H. Eggebrecht and al. (Darmstadt, 1984), 113-119 and 133-135.

Practising polyphony at the University?

Liturgy at the Arts faculty

The University as a single institutional body had a very limited role in the organisation of the liturgical life of its members. Besides a few masses held every year in the Church of the Mathurins in the *Clos de Garlande*, several formal processions of university members and sworn servants, parading in assigned order, also punctuated the liturgical year.[5] The University was also in charge, *c.*1300, of five commemorative chapels endowed by royal or ecclesiastical authorities and obtained in compensation of crimes that had been committed against students and masters.[6]

In fact, many of the ecclesiastical duties were carried out within each faculty, and for the Arts faculty, within each national grouping. The masses and offices indigenous to the four nations were celebrated in a designated chapel or church: the French nation in the Church of St. Nicolas-des-Champs or in the Church of St. Etienne-des-Grès, or after 1305, in the chapel of the newly founded College of Navarre; the Picard nation in the Church of St. Julien-le-Pauvre; the Norman nation in the Church of the Mathurins or after 1311 in the chapel of the *Collège de Harcourt*; finally, the Anglo-German nation in the Church of the Carmelites on the *place Maubert*, in the Basilica of St. Côme et St. Damien or in the Church of St. Julien-le-Pauvre.[7]

Very little is known about the actual nature of the various liturgies cultivated by the nations of the Arts faculty of Paris. Statutes from 1336 tell us that the French and Norman

[5] The fourteenth-century calendar of the Law faculty transmitted in F-Pa 1123, fols. 1r-7v, indicates five *misse communes universitatis* (3 feb., 3 nov., 11 nov., 26 nov., 7 dec.). For the university processions see the *ordo processionum* transmitted in F-Psg 1655, fols. 11r-14v, a fourteenth-century manuscript which formerly belonged to the Picard nation. On this manuscript see M. Huglo, *Les manuscrits du processional*, *RISM* B/XIV/1 (Munich, 1999-2004), II, 135.

[6] On these episodes see C. E. Du Boulay, *Historia universitatis Parisiensis*, (Parisiis, 1665-1673), III, 452-3, 490, 542-3; IV, 364 and 674. By the end of the fourteenth century the University had twelve chaplaincies. For later foundations see also C. Du Breul, *Le théâtre des antiquitez de Paris* (Paris, 1612), 619-620.

[7] For further details, see Du Boulay, *Historia*, III, 492-4. See also Id., *De patronis coelestibus 4 nationis* (Paris, 1662).

nations celebrated, according to a long established and widespread medieval tradition, a weekly Lady mass on Saturdays preceded by a Vespers service on Fridays.[8] The members of the Anglo-German nation gathered every Saturday to sing a Lady mass.[9] The Picard and Norman nations celebrated Vespers and Mass for the five Feasts of the Virgin, for St. Catherine and St. Nicholas, the two most important patron saints of medieval students.[10] This was also probably the case in the other nations. In addition to the weekly Saturday service and these *annuale* feasts, each nation took special care in commemorating its patron saint: St. Roman for the Norman nation, St. Firminus for the Picard nation, St. Edmund for the Anglo-German nation and St. William of Bourges for the French nation.[11]

To adequately perform the liturgical celebrations, each nation owned the necessary ornaments, furniture and liturgical books. An inventory of the French nation in 1339 mentions, among others, four chant books and two quartos with vellum cover *pro capella*.[12] In 1382, the Picard nation owned three small books containing the Office for St. Nicholas.[13] Having noted discrepancies in its chant books, the Anglo-German nation had three new chant books written in 1407.[14] Unfortunately, these books have not survived. The only identified liturgical book from the University of Paris is a beautifully illuminated missal, F-Pm 413, offered in 1403 by King Charles VI to the French nation.[15] Because this book does

[8] *CUP*, III, no. 1004 [statutes of the French nation, 1336] and no. 1008 [statutes of the Norman nation, 1336].
[9] *AUP*, II, 6.
[10] Du Boulay, *Historia*, IV, 333. For the Norman nation see Du Breul, *Le théâtre*, 639-640.
[11] See notably the calendar of the Anglo-German nation, *AUP*, I, 1-11.
[12] 'Quattuor libri de cantu pro capella et duo quaterni cooperti vitulo.' (*CUP*, II, no. 1028; see also Pirro, 'L'enseignement', 31).
[13] *CUP*, III, no. 1470.
[14] *AUP*, II, 6
[15] Victor Leroquais (*Les sacramentaires et missels des bibliothèques publiques de France* [Paris, 1924], II, no. 519) associates this manuscript with the Royal chapel. Even though the coats of arms of the Royal family (King, Queen and Dauphin) have been added on fol. 8r. A note on fol. 228r indicates that the missel was bought by the King for the chapel of the French nation of the University of Paris, which was at that time the chapel of the Royal college of Navarre: 'Anno Domini MCCCCIII die vicesima secunda mensis novembris fuit istud missale emptum pro nacione Francie ad usum sue capelle.' In addition, a bifolio containing the office for St William of Bourges, the patron saint of the French nation, has been interpolated after fol. 106. A finely executed miniature depicts the saint blessing young students and the text below the image reads: 'De sancto Guillelmo Biturensis archiepiscopo venerande nationis Francie patrono.'

not contain any musical notation, it is very difficult to further specify the musical and liturgical usages which paced academic life in Paris.

However, judging from the extant account rolls, it would seem that the French and Anglo-German nations put some special effort into the celebration of their respective patron saints, a time of revels that took place *et in ecclesia et in taberna*.[16] From 1370 onwards the Anglo-German nation regularly hired professional singers on the day of St. Edmund.[17] Between 1413-1416 the nation counted among its ranks an organist, master Henricus de Saxonia, bachelor in medicine, who was paid to play for the feast of St Edmund alongside with *cantores*.[18] The registers of the French nation (1443-1456) record several payments to an organist and to *cantores* not only for the celebration of St. William of Bourges[19] but also for such important feasts as St. Nicholas, St. Catherine, the Conception, Ascension and Nativity of the Virgin Mary.[20]

The hiring of professional musicians (singers and organist) by the nations of the University of Paris in the late fourteenth and early fifteenth centuries may be seen as evidence of the use of polyphony on solemn feast days. If we assume that such a practice could have originated in the thirteenth century, browsing through the extant Latin polyphonic repertoire may reveal musical pieces that may have been composed to match the liturgical needs of the nations of the Parisian Arts faculty. We have seen that all four nations celebrated with great solemnity St. Nicholas, St. Catherine and the five major Feasts of the BMV. Numerous polyphonic pieces that could have been sung on these solemn days survive. Unfortunately, because these high ranked feasts were internationally and widely celebrated (including at Notre Dame of Paris and at many other Northern French cathedrals

[16] See *AUP*, I, 820.
[17] *AUP*, I, 373, 406, 417, 460, 479, 508, 595, etc. See also Pirro, 'L'enseignement', 30.
[18] *AUP*, I, 139, 202 and 213. Henricus became the organist of Notre Dame in 1415. See Pirro, 'L'enseignement', 32.
[19] *AUP*, V, 15, 67, 127, 186, 287, 466, 504 and 580.
[20] *AUP*, V, 308, 325, 330, 335, 342, etc. In 1487, the French nation claimed rights on the organ that had been placed in the chapel of the College de Navarre where it usually held its solemn celebrations (the document is edited by Du Boulay, *Historia*, V, 779).

and religious institutions),[21] it is difficult to draw direct links between these pieces and official university celebrations.

Turning to the more idiosyncratic celebrations of the 'national' patron saints does not yield more fruitful results. No polyphonic pieces dedicated to the patron saints of the Picard and Norman nations, St. Firminus and St. Roman, have been identified.[22] Surviving pieces dedicated to St. Edmund, the patron of the Anglo-German nation and a saint widely celebrated in England, are only transmitted in fourteenth-century English sources.[23] There exist three polyphonic pieces dedicated to St. William of Bourges (canonized in 1218) in the main sources of Notre-Dame polyphony, but these pieces were probably composed for the Chapel of the King.[24] Yet, it is possible that the musical pieces for these very important feast days could have been drawn from the polyphonic repertoire of the *commune sanctorum*.

Another interpretation is that the hiring of professional singers by the nations of the Arts faculty was prompted by the rather poor musical abilities of their members. In 1370, for instance, the Anglo-German nation paid professional singers for the feast of St. Edmund not only to enhance the solemnity of Mass (*pro solemnisatione*) but also to remedy to the mediocre quality of the singing which already had occasioned much embarrassment during the Vespers service.[25]

The poor quality of the singing at the University may also explain the presence of two teachers *in arte musice*, *actu docendi Parisius ex licentia universitatis*, in a *rotulus* of supplications sent to the Avignonese Pope Benedict XIII in 1403.[26] The first teacher was a

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[21] For a discussion of the calendar of Notre-Dame and its relation with other Northern French cathedrals see C. Wright, *Music and Ceremony at Notre Dame of Paris 500-1500* (Cambridge, 1989), 70-81.
[22] It is noteworthy that *c*.1340 the succentor of Notre-Dame, Jean Lupi, elevated the feast of St. Firminus to *duplex* rank. See Wright, *Notre-Dame*, 77-8.
[23] See the following motets dedicated to Saint Edmund: *Ave miles celestis* (a 4; GB-Ob e Museo 7, fols. Vv-VI); *Ave miles de cuius milicia* (a 4; GB-Lw 33327, fol. 2v); *De flore mentium* (a 3; GB-Ob e Museo 7, fols. Vv-VI); *Flos anglorum Inclitus* (a 2; GB-Omc 266-8, fols. 26r-v).
[24] See M. Huglo and B. Haggh, 'Magnus liber – Maius munus', *RM*, 90/2 (2004), 210.
[25] *AUP*, I, 373. See also Pirro, 'L'enseignement', 30. There are payments for *cantores* recorded in 1371, 1372, 1374, 1375 and 1376 (see *AUP*, I, 406, 417, 460, 479 and 508). In 1380 the Anglo-German nation decided to cut the expenses and thus: 'quilibet voce Alemanica cantaret quanto dulcius sciret.' (*AUP*, I, 595).
[26] See *CUP*, IV, no. 1796; Pirro, 'L'enseignement', 31; Carpenter, *Universities*, 53.

priest from the diocese of Evreux, Johannes Comitis, who, in 1398 and 1402, was also master of the choirboys of Notre-Dame.[27] The other teacher, Guillelmus of Burgundy, is also a Priest but from the diocese of Paris. Guillelmus is further described as a *cantor universitatis*, an office also held by Johannes Comitis in 1399.[28] That the names of the two music teachers and singers of the University appear at the very end of the *rotulus* is not accidental. Such a position clearly indicates that the two men were not considered as full members of the University corporation, otherwise their names would have been included in the lists of names submitted by their respective nations (the Norman nation for Johannes Comitis and the French nation for Guillelmus of Burgundy). In short, they were not considered masters but rather sworn servants benefiting from the privileges of the University of Paris. Other European universities such as Bologna or Salamanca also counted professional musicians (trumpeters, organists, singers) among their sworn servants.[29]

Therefore it was most likely in order to enhance the quality of the singing that the university authorities decided to employ two qualified music teachers. Their function was not only to perform during the official celebrations and processions of the corporation, of the higher faculties, or of the nations,[30] but also to provide optional yet probably recommended music tuition to the students and masters who wished to gain deeper musical proficiency. The recently appointed Chancellor Jean Gerson may be at the origin of such an institutionalisation of musical instruction. His efforts to reform the musical education and practices in the institutions he frequented are indeed well documented. For instance, in 1396, a few days after his assumption to the office of Dean of Saint-Donatian in Bruges, Gerson summoned the chapter to a meeting *super reformationem divini officii*.[31] As Chancellor of Notre-Dame, Gerson also wrote in 1411 a short *Doctrina pro pueris ecclesiae*

[27] On Johannes Comitis, see Wright, *Notre Dame*, 172.
[28] *CUP*, IV, no. 1796. Guillemus also knew how to play the organ since he became in 1402 the organist of St Germain l'Auxerrois. See A. Pirro, *La musique à Paris sous le règne de Charles VI* (Strasbourg, 1930), 19.
[29] Carpenter, *Universities*, 66 and 83.
[30] In 1418 the English nation hired on the day of the feast of St Edmund 'cantores Universitatis pro maiori solemnizacione.' (*AUP*, VI, 256).
[31] See R. Strohm, *Music in Late Medieval Bruges* (Oxford, 1990), 22.

for the education and governance of the choirboys of the cathedral.[32] Knowing Gerson's rather conservative attitude towards music,[33] it seems improbable that the two music teachers of the University concentrated their energies on the strenuous cultivation of polyphony. Rather, the practice of music is important for Gerson for pedagogical and pastoral reasons; it keeps the young away from sinful idleness.[34]

From the sundry information gathered here, there emerges an image of the official liturgical life at the Arts faculty of Paris. Apart from a few celebrations of the university congregation as a whole, most of the liturgy was left to the discretion of the nations, which exercised certain latitude in shaping the liturgical calendar. As we have seen, the references, from 1370 onwards, to professional singers and organ players hired by the nations on such solemn days as the Feasts of the BMV, of St. Catherine, St. Nicholas or of their patron saint, do not necessarily imply that complex polyphony was performed on these occasions. Furthermore, the late date of such references may not be a consequence of imbalances in the preservation of university records. For instance, detailed account books of the Anglo-German nation survive, dated prior to 1350, but they do not mention any payments to professional musicians on the day of St. Edmund. The resort to professional musicians on solemn feasts may then have first occurred in the second half of the fourteenth century. It is perhaps in connection with such efforts to enhance the quality of singing during liturgical celebrations that by 1403 the university authorities decided to provide practical musical instruction to its members by hiring two qualified music teachers. There is no reason to surmise that music education was placed under the aegis of the Parisian *alma mater* prior to that date.

This does not mean, however, that members of the Arts faculty of Paris did not engage in the practice of polyphony in the margins of academic festivals or for recreation.

[32] See Wright, *Notre-Dame*, 166-169, 177 and 348.
[33] Wright, *Notre-Dame*, 169.
[34] See J. Irwin, 'The Mystical Music of Jean Gerson', *EMH*, 1 (1981), 196.

Singing or playing an instrument for cash in hand represented for poor students a means to match the heavy costs entailed by higher education. There is also little doubt that the groups of informed musicians who listened to, enjoyed and performed the subtle polyphony of word and music of the motet comprised university members. Jacobus Leodiensis represents a very good example of a music-loving member of the Arts faculty of Paris who enjoyed listening to motets.[35] Johannes de Grocheio is another music-lover who probably studied at the Arts faculty of Paris. In his *De musica*, he not only displays an impressive knowledge of the numerous forms and genres of monophonic and polyphonic, of sacred and secular music practised in Paris *c.*1300, but also a close familiarity with the repertoire of the time. Finally, we have seen in Chapter 4 how Johannes de Muris and his fellows *doctores musicae*, some of whom were linked to the Arts faculty of Paris, discussed problems of rhythmic notation. These individuals also frequented the circles which performed measured polyphony of the most innovative kind.

Thus, although members of the Arts faculty certainly engaged in the practice and learning of measured polyphony (at least in the fourteenth century), there were no official endeavours from the university authorities to encourage such musical practice and learning in the thirteenth and early fourteenth centuries, that is to say, during the most crucial period in the development of *musica mensurabilis*.

Polyphony in the Colleges?

The period 1250-1350 saw the extraordinary flourishing of a new type of educational institution related to the University: the College, a quasi-autonomous community of men living in endowed buildings, governed by a duly appointed or elected official according to certain rules approved and imposed by external ecclesiastical or secular authorities. Paris

[35] Jacobus Leodiensis, *Speculum musicae*, VII, 17, p. 38 and 48, p. 95.

saw in the thirteenth and fourteenth centuries no less than 59 foundations of colleges sheltering communities of scholars and affiliated individuals (*hospes*), which varied in size from four individuals to up to one hundred.[36] Instituted by senior members of the clergy, the Royal administration or by the Royal family itself, the Parisian colleges had a two-fold educational and religious function.[37] On the one hand they provided privileged access to education for poor students from a specific geographical area (generally that of the city or the diocese of origin of the founder) and on the other hand, as pious foundations, they followed quasi-monastic rules and customs.

Although the musical life of Parisian colleges is largely unknown, music historians concur on the prominent role played by these educational institutions as centres for the performance and teaching of polyphony, even of the most experimental kind.[38] Should we then picture the fellows and *hospes* of Parisian colleges as an eager audience for polyphony and ardent participants in musical gatherings? Can colleges be considered as creative musical centres offering instruction in *musica mensurabilis* not only to their members but also to the whole student body? Answering these questions may, no doubt, help fill in the disquieting institutional blank which shrouds the momentous developments of Parisian polyphony in the thirteenth and fourteenth centuries. Before turning to musical life within the walls of Parisian colleges, we shall first broach the important issue of the place of musical instruction in collegial education.

The institutional setting of the college was propitious to an enlargement of the university curriculum. In laying down the statutes the founders of medieval colleges could prescribe the study of neglected or useful disciplines. Practical music was one such discipline. In Toulouse, the College of Arnaud de Verdale (founded in 1337) offered to poor

[36] See H. Rashdall, *The Universities of Europe in the Middle Ages*, eds. F. Powicke and A.B. Emden (Oxford 1942-58), I, 536-9.
[37] See A. Gabriel, 'Motivations of the Founders of Medieval Colleges', in *Garlandia. Studies in the History of the Medieval University* (Frankfurt, 1969), 211-223.
[38] See above 241.

students a free training in chant and in the scribal crafts so that they could become financially independent as soon as possible.[39] At Oxford, the statutes of Merton, Balliol, Queen's and New College mention the existence of groups of very poor boys (*magis pauperes pueri*) who served as choristers in the collegial chapels in exchange for board, lodging and free instruction in grammar and chant.[40] The founder of Queen's College, Robert Eglesfield, even provided in 1341 a special endowment for two clerks, sufficiently instructed in plainsong and in *musica mensurata*, whose task was to teach chant and, if possible, polyphony to the poor choristers of the College.[41]

It seems, however, that in Paris the situation was different. Parisian colleges did not have special endowments for the maintenance of choristers. Information concerning musical instruction is only to be found in the statutes of the few colleges which offered pre-Arts training. At least seven colleges proposed this kind of grammar school education designed to prepare youngsters aged between 8 and 16 for future studies in the Arts faculty.[42] In fact, even in this handful of preparatory colleges, the overall attitude regarding the place of music in the curriculum is marked by a discomforting elusiveness.

It is perhaps because the *Collège de Boissy* (Statutes, 1366) and the *Collège de Dainville* (Statutes, 1380) admitted only candidates with a certain level of literacy (i.e. those who had already studied Donatus and Cato) that their respective statutes do not refer to music; knowledge of chant was probably already assumed.[43] The statutes of the *Collège de Dormans-Beauvais* (1380) indicate that the fellows were taught *gramatica positiva et*

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[39] M. Fournier, *Les statuts et privilèges des Universités françaises depuis leur fondations jusqu'en 1789* (Paris 1891), I, no. 593.

[40] See *Statutes of the University of Oxford* (Oxford, 1853-55), Merton College, I, 20; Balliol College I, 7 and 14; Queen's College, 30-31; New College, 78.

[41] 'Sunt etiam in eadem capella seu ecclesia duo clerici de cantu plano ac musica mensurata sufficienter instructi […] et pueros pauperes de cantu doceant […] in cantu plano et insuper quantum bono modo fieri poterit, mensurato […].' (Queen's College, *Statutes*, I, 29-30).

[42] In chronological order of foundation: Navarre (1305), Cornouailles (1321), Plessis (1322), Ave Maria (1336), Boissy (1354), Dormans-Beauvais (1370), Dainville (1380). There is also the *Collège de Calvi* founded by Robert de Sorbon in 1271 of which records have survived.

[43] Respectively: Féret, *La faculté*, III, 622 and Félibien, *Histoire*, III, 507. See also Lusignan, 'Collèges', 45.

regularis but not music.[44] Similarly, the early statutes of the *Collège de Navarre* (1315) only point out that lessons in Latin grammar took place within the College.[45] A competence in chant was required from all the fellows of the *Collège de Cornouailles*. Anyone who had not gained a sufficient proficiency in *cantus planus* within a year after his entry in the *Collège de Cornouailles* could be deprived from his scholarship and expelled.[46] The reason for such severity could be linked to the obligation, for each scholar, to regularly assist the chaplain of the college and to participate actively in the constraining daily liturgical duties.[47] Yet, that the statutes of the college do not refer to music lectures suggests that the fellows had to go elsewhere to improve their musical skills.

In fact, the only detailed account of musical instruction in a Parisian college is to be found in the statutes of the *Collège de l'Ave Maria* founded in 1336 by the Cardinal Jean de Hubant. This text lays down a very detailed curriculum, which gives pride of place to the teaching of music.[48] To have a good and graceful voice and a natural aptitude for singing were among the necessary conditions of eligibility for a college fellowship.[49] When entering the college at age 8 or 9, the boys were first taught how to serve in the chapel *sine cantu*. This implied memorizing several antiphons and prayers for the Virgin and the Saints (*Salve regina*, *De profundis*, *Inclina*, *Fidelium Deus*, *Omnipotens sempiterne Deus, qui gloriose Virginis*, etc.) and then learning how to read the traditional devotional texts to the Virgin (litany and Hours), the penitential Psalms, the Vigils of the Dead and the Psalter. After this preliminary stage, the boys were then taught how to write and how to sing. Once the

[44] F-Pan, MM 356, fol. 1v.
[45] Du Boulay, *Historia*, IV, 92. The only reference to musical instruction in the *Collège de Navarre* dates from January 1474 when King Louis XI reserved one of the grammar fellowships to one of the choirboys of Notre Dame whose voice had just broken. Louis XI describes the college as the most suitable place to study grammar and to practice the 'art of music'. But he refers more to the practice of music in the collegial chapel rather than to formal lectures on the discipline. See J. de Launoy, *Regii Navarrae gymnasii Parisiensi historia*, (Paris, 1677), II, 189. Following the *Collège de Navarre* several other colleges also reserved scholarships for trained choirboys. See Pirro, 'L'enseignement', 48-9.
[46] 'Quilibet scholaris tenebitur scire et addiscere plenum cantum sub poena privationis loci et bursarum infra annum postquam domum intraverit.' (Félibien, *Histoire*, III, 498).
[47] See Appendix A.
[48] This college has been the object of an enlightening monograph by A. Gabriel, *Student Life in Ave Maria College* (Notre-Dame, 1955).
[49] 'habiles eciam pro cantu, vocem bonam et gracilem habentes.' (Gabriel, *Ave Maria*, 352).

rudiments of chant were acquired, they had to learn the chant repertoire necessary for the liturgy of the College in order to participate actively in the Offices.[50] It is only when they were sufficiently instructed in chant that Latin grammar became the main discipline and around age 12-13, the curriculum integrated logic, algorism and computus.[51]

This kind of progression reflects an enduring educational method in the medieval West, already documented, for instance, in the tenth- and eleventh-century customaries of Cluniac and Benedictine monasteries.[52] In Paris, two centuries later, the Cathedral school of Notre-Dame and the Sainte-Chapelle followed similar educational methods for the instruction of their choirboys. In both institutions, as in the *Collège de l'Ave Maria*, instruction in music alternated with instruction in Latin grammar and at a later stage, at least in Notre Dame, in logic. In Notre-Dame, the education of the boys was entrusted to a *magister cantus* who by the end of the fourteenth century was assisted by a master of grammar.[53] Similarly, one *maistre de chant* and one *maistre de grammaire* oversaw the education of the choirboys in the Sainte-Chapelle.[54] Yet in contrast with the *Collège de l'Ave Maria*, the educational policies of Notre-Dame and of the Sainte-Chapelle prescribed the practice of polyphony. The *Doctrina pro pueris ecclesiae Parisiensis* of Chancellor Gerson authorises the music master to teach the choirboys of Notre-Dame 'counterpoint' (*contrapunctus*) and other 'honest discants' (*honesti discanti*).[55] The boys of the Sainte-Chapelle were even encouraged to learn and memorise pieces of secular polyphony such as

[50] Gabriel, *Ave Maria*, 356-7.
[51] The only grammar book authorised at the early stage of education was Donatus' *Ars maior*: 'statim postquam scient deservire in capella sine cantu, quod omnino adiscant ad cantandum antequam audient aliquid de gramaticalibus suis nisi Donatum solum.' (Gabriel, *Ave Maria*, 357). For the teaching of grammar and logic, see Gabriel, *Ave Maria*, 325. For further details on elementary education in the Colleges see A. Gabriel, 'Preparatory Teaching in the Parisian Colleges during the Fourteenth Century', in *Garlandia*, 97-124.
[52] See the analysis of various monastic customaries by S. Boyton, 'Training for the Liturgy as a Form of Monastic Education', in *Mediaeval Monastic Education*, ed. C. Muessig and G. Ferzoco (Leicester, 2000), 7-20.
[53] See Wright, *Notre-Dame*, 165-9 and 174-180; Wright's account is essentially based on Chancellor Gerson's *Doctrina pro pueris Ecclesiae Parisiensis* (1411).
[54] See the statutes *c.*1350 regulating the education of the choirboys at the Sainte Chapelle, edited by M. Brenet, *Les musiciens de la Sainte-Chapelle du Palais* (Paris, 1910), 15-20.
[55] Wright, *Notre-Dame*, 167.

mottez, balades et teles choses for future performance in front of the King and his retinue.[56] That the choristers of Notre-Dame and the Sainte-Chapelle received a more complete and demanding tutelage in music is easily explained by the fact that nearly all their activities were directed toward the celebration of the divine offices in institutions renowned for their high-standard ceremonial. In the *Collège de l'Ave Maria*, on the contrary, the main and primary aim was to prepare students for future studies in the Arts faculty; indulging in the practice of polyphonic music was probably seen as a time-consuming and superfluous activity.

Before turning to the musical life in Parisian colleges, it remains to investigate the peculiar cases of the *Collège de Navarre* and of the Sorbonne. Modern musicologists have associated the name of Philippe de Vitry to the Royal *Collège de Navarre* founded by Queen Jeanne between 1305-1315.[57] Recent prosopographical research has clearly established that he was never part of this institution. It is only when he was elevated to the See of Meaux in 1351 that, in accordance with the statutes of the College, he became *de facto* one of the governors of the College.[58] Thus, the affirmation of the anonymous author of the *Quatuor principalia* according to which the *minima* was invented *in Navarina* before being used by Philippe de Vitry cannot be interpreted as signifying that the *minima* was invented in the *Collège de Navarre*.[59]

The Sorbonne has often been seen as a centre for the instruction and practice of polyphony.[60] This is due to the fact that its prestigious library counted among its holdings in 1338 several books of *organum* and also the only extant copy of Jerome of Moravia's *Tractatus de musica* (ms. F-Pn lat 16663), a compilation of music theory containing notably

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[56] Brenet, *Les musicians*, 16.
[57] See Gilles, 'Contribution', 151; W. Frobenius, 'Numeri armonici. Die Zahlen der Timaios-Skala in der Musiktheorie des 14. Jahrhunderts', in *Kontinuität und Transformation der Antike im Mittelalter*, ed. W. Erzgräber (Sigmaringen, 1989), 252.
[58] N. Gorochov, *Le collège de Navarre de sa fondation (1305) au début du XV^e siècle (1418)* (Paris, 1997), 301-302.
[59] *Quatuor principalia*, 257. See also Frobenius, 'Numeri', 253.
[60] See Huglo, 'Recherches', 15; R. Baltzer, 'Notre Dame Manuscripts and Their Owners: Lost and Found', *JM*, 5/3 (1987), 392-5.

two extremely influential treatises on *musica mensurabilis*, Johannes de Garlandia's *Musica mensurabilis* and Franco of Cologne's *Ars cantus mensurabilis*.[61]

It should be noted that the constitution of the Sorbonne collection followed no rational policy and was in great majority circumstantial. In other words, the library holdings as listed in the 1338 catalogue do not reflect the needs of its users. Furthermore, that, by 1321, Jerome of Moravia's treatise was chained (*incathenatus*) with other reference books in the *libraria communis* in no way implies that 'the practical study of polyphonic composition was being taught in the university'.[62] The college of Sorbonne was exclusively a college of theologians and the disputations held therein treated strictly theological issues.[63] In addition, the chained library contained other texts such as the *Roman de la Rose*, the Koran or even alchemical and geomantic texts which were undoubtedly not in the university curriculum.[64] In fact, a 1321 regulation from the College tells us that only the best manuscript copy of a text or the best text for each science was to be chained in the library.[65] Hieronymus' *Tractatus* entered into this category because it presented in a single volume a totalising compilation of music theory including not only the short *positiones* on *musica mensurabilis* but also chant theory (drawn mainly from Guido of Arezzo and Johannes Afflighem) and, above all, an almost complete copy of the music textbook of the Arts faculty of Paris, Boethius' *De institutione musica*.[66] The fact that no other copy of Boethius' treatise was chained seems to corroborate this view. Because Hieronymus' compilation was chained in the library, one can neither assume that the texts on *musica mensurabilis* it

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[61] On the musical books of the Sorbonne see Hentschel, *Sinnlichkeit*, 271-8. Hieronymus' *Tractatus* was bequeathed to the Sorbonne in 1306 by the famous theologian and astronomer Pierre de Limoges, see M. Huglo, 'La place du *Tractatus de Musica* dans l'histoire de la théorie musicale du 13^{e} siècle (étude codicologique)', in *Jérôme de Moravie. Un théoricien de la musique dans le milieu intellectuel parisien du 13^{e} siècle*, ed. C. Meyer (Paris, 1992), 34.

[62] Baltzer, 'Notre-Dame', 394; and for a similar view, Huglo, 'Recherches', 15.

[63] P. Glorieux, *Aux origines de la Sorbonne* (Paris, 1966), I, 224-27.

[64] The 1338 catalogue of the chained library is edited by L. Delisle, *Le cabinet des manuscrits de la bibliothèque nationale* (Paris 1871-81), III, 80-114. It also contains two unidentified music theory treatises (incipits '*Quoniam musica non solum*' and '*Musica tria sunt genera*') transmitted in two mathematical collections (ancient shelfmarks AB/h and B/b). See Deslisle, *Le Cabinet*, III, 90.

[65] See R. Rouse, 'The Early Library of the Sorbonne', *Scriptorium* 21/1, (1967), 60-69.

[66] On the extensive use of Boethius' treatise in Hieronymus' *Tractatus* see C. Meyer, 'Lecture(s) de Jérôme de Moravie - Jérôme de Moravie, lecteur de Boèce', in *Jérôme de Moravie*, 56-74.

contains were widely and frequently consulted nor that they became the subject of university lectures.

In sum, teaching practical music in Parisian colleges was exceptional. Only the *Collège de l'Ave Maria* and perhaps a few other pre-Arts colleges seems to have provided musical instruction to their members, an instruction which was, in all likelihood, confined to learning the rudiments of chant. It is therefore unlikely that the colleges constitute the missing institutional context for the teaching of polyphony in medieval Paris. Yet, because the colleges were religious institutions founded with a chapel and endowed personnel to celebrate the liturgy, there remains the tantalizing question of the practice of polyphony as part of the collegial ceremonial.

As Appendix A shows, the size of the chapel and the number of celebrating clergy varied greatly from one college to the other, depending upon the original endowments of the founder and later provisions made by generous benefactors. For instance, the *Collège de Dainville*, which counted a small community of twelve scholars, had no separate chapel, and a master cumulated the function of head of the college, proctor and chaplain.[67] In contrast, the founder and benefactors of the *Collège de Dormans-Beauvais* provided endowments for two chapel clerks, four chaplains, and on the 30 January 1374, King Charles V himself laid the founding stone of the magnificent collegial chapel dedicated to Saint John the Evangelist.[68]

As with any other members of the community, the chaplains and chapel clerks of Parisian colleges were recruited in the diocese of origin of the founder of the college. Some colleges provided separate fellowships for the chaplains whereas others gave an additional stipend to a carefully selected and duly competent fellow of the college to officiate in the

[67] See Appendix A and the map of the college in *c.*1750 (AN, S 6425, no. 13).
[68] On the chapel of the college see D. Chapotin, *Le Collège de Dormans-Beauvais* (Paris, 1870), 85-113.

chapel. In exceptional circumstances, external celebrating personnel could also be hired.[69] In general, the chaplains had to be honest and of good repute, well versed in chant and in the celebration of the divine office.[70] In contrast with the Sainte-Chapelle where to be conversant with the art of *discantus* was one determining criterion for the recruitment of the chaplains,[71] no particular skill in polyphony was ever required to join one of the Parisian colleges. For instance, in the *Collège de Cambrai* (Statutes, 1348) the chaplain had to possess some administrative competence, to be instructed in grammar, to know the divine office and to be sufficiently proficient in psalmody and singing.[72] In the *Collège des Lombards* (Statutes, 1333) the chaplain was chosen for his probity, his knowledge of French and his competence in the 'art of singing'.[73] Similarly, the chaplains of the *Collège de Dormans-Beauvais* were to be honest, of a good reputation and sufficiently competent 'in the arts of singing and reading'.[74]

The founders of Parisian colleges exercised considerable latitude in shaping the terms of the ecclesiastical and musical life in these institutions, as is noticeable in the numerous statutory regulations that concern liturgy. The liturgy of each college usually intertwined features from the Parisian usage with features from usages of the diocese of

[69] For instance, when the plague was raging in 1399, having decimated a large portion of the Parisian population, the *Collège de Dainville* hired a priest from the *Collège des Cholets* to celebrated the mass since the chaplain had left to escape the epidemic: 'Item pro celebratis missis in dicto collegio per unum virum honestum magistrum collegii theologorum de Choletis[…] sacerdotes qui consueverunt celebrare in dicto collegio fuerunt absentes occasione huiusmodi mortalitatis sicut fuerunt plures alii de universitate et aliis collegiis studii Parisiensis.' (F-Pan, M 120, no. 20, fol. 49r; *a*. 1399).

[70] It is noteworthy that any defect in celebrating the offices was sanctioned in most colleges by a fine which could amount to half of a *bursa* (i.e. half of the chaplain's weekly salary).

[71] A statute from 1405 describing the role of the *cantor* of the Sainte Chapelle makes explicit that the celebrating clergy performed polyphony: 'Capellanis and clericis dictae capellae quos cantor praedictis ex sui offici debito et fundatione instruere habet et corrigere in lectio, cantu, discantu, accentu […].' (Félibien, *Histoire*, III, 134).

[72] 'Nullus admittat […] capellanum nisi sciat bene legere et bene cantare et in grammaticalibus laudabiliter instructus et nisi sciat divinum officium et procuratoris officium utiliter exercere.' (Félibien, *Histoire*, III, 432; also quoted in Pirro, L'enseignement, 31).

[73] 'Capellanus sit persona honesta et bonae vitae qui bene noverit gallicam linguam et artem cantandi.' (R. Manno-Tolu, *Scolari italiani nello studio di Parigi. Il 'Collège des Lombards' dal XIV al XVI secolo* [Rome, 1989], 147).

[74] 'Capellanus sit honestus et bonae vitae et sufficienter edoctus in artes cantandi et legendi.' (F-Pan, M 88, no. 23; *a*.1425).

origin of the founder and the collegial community.[75] The *Collège de Cornouailles*, for instance, followed the Parisian usage for certain feasts, for the office of the Virgin on Saturdays and the office of the Dead on Sundays while incorporating in its liturgical calendar feasts for local saints only celebrated in Brittany (e.g. Saint Yvo or Saint Corentin). Similarly, the *Collège des Cholets*, an institution for students from the dioceses of Beauvais and Amiens, celebrated with fervour and solemnity several typically Picard saints (e.g. Saint Just, Saint Lucian, Saint Firminus).[76]

On schooldays, the religious duties were reduced to a minimum in most colleges and the presence of the fellows, particularly those studying Arts, was not required lest their academic activities and progress be hindered.[77] In a few colleges, the chaplains still celebrated on these days a brief mass *cum nota* or *cum cursili nota* (e.g. *Collège de Navarre*, *Collège du Plessis* or *Collège de Dormans-Beauvais*) but most often this daily mass was hastily celebrated without any music (*sine nota*).[78] In contrast, the Vespers, Matins and Mass of solemn feasts, the offices of the Virgin on Saturdays, the Sunday mass, the commemorative masses for the founder and sometimes the Monday Requiem were usually celebrated with music (*cum nota*). Attendance at these services was compulsory for the fellows and any unjustified absence or late-coming was punished by a fine which varied from 1d. per office missed in the *Collège de Harcourt* (Statutes, 1311) to a whole *bursa* for one day of celebrations missed in the *Collège de Navarre* (Statutes, 1305).[79] It seems that the music performed on these occasions was confined to plainsong only. Neither the statutes of the Parisian colleges nor the extant identified liturgical books that once belonged to these institutions make reference to the use of polyphony in the collegial liturgy (see Table 3).

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[75] See Appendix A.

[76] See the additions in the thirteenth-century Parisian missal F-Ps 177 bequeathed to the *Collège des Cholets* in the late thirteenth century.

[77] See for instance the statutes of the *Collège de Harcourt* (1311): 'artistas diebus legibilibus ad missam nolumus obligari.' (Du Boulay, *Historia*, IV, 155); and the statutes of the *Collège de Maître Gervais*: 'Nolo tamen artistas diebus et horis quibus legitur in facultate sua ad sercivium obligari.' (Féret, *La faculté*, III, 644). A notable exception is the *Collège de Narbonne*, see Appendix A

[78] See Appendix A.

[79] Respectively in Du Boulay, *Historia*, IV, 155 and 77.

Signature	Type of book	College	Main Usage	Composition/ *Entry in the library*	Description
F-Pa 195	Notated psalter	Cardinal Lemoine	Paris	late 13th cent./ *early 14th cent.*	Leroquais, *Psautiers*, no. 249
F-Ps 177	Missal	Cholets	Paris	13th cent./*13th cent.*	Leroquais, *Sacramentaires*, no. 246
F-Ps 178	Breviary	Cholets	Paris	13th cent./*14th cent.*	Leroquais, *Bréviaires*, no. 717
F-Ps 1220	Breviary	Cholets	Paris	13th cent./*1422*	Leroquais, *Bréviaires*, no. 720
F-Ps 705	Missal	Laon	Laon	14th cent./*15th cent.*	No published description
F-Pn lat. 1123	Processional	Navarre	College	*c.*1380/*c.1380*	Huglo, *Processionels*, II, 111
F-Pm 411	Missal	Navarre	Paris	15th cent./*16th cent.*	Leroquais, *Sacramentaires*, no. 518
F-Pn lat.15181-15182	Breviary	Sorbonne	Paris	late 13th cent./*1637*	Leroquais, *Bréviaires*, no. 627
F-Pn lat. 15613	Breviary	Sorbonne	Paris	13th cent./*1274*	Leroquais, *Bréviaire*s, no. 628
F-Pn lat. 15614	Missal	Sorbonne	Soissons	12th cent./*15th cent.*	Leroquais, *Sacramentaires*, no. 236
F-Pn lat. 15615	Missal	Sorbonne	Paris	*c.*1270/*14th cent.*	Leroquais, *Sacramentaires*, no. 294
F-Pn lat. 15616	Missal	Sorbonne	Evreux	13th cent./*1271*	Leroquais, *Sacramentaires*, no. 248
F-Pn lat. 16304	Breviary	Sorbonne	Northern France	early 13th cent./ *14th cent.*	Leroquais, *Bréviaires*, no. 629
F-Pn lat. 16305	Breviary	Sorbonne	Meaux	13th cent./ ?	Leroquais, *Bréviaires*, no. 630
F-Pn lat. 16307	Breviary	Sorbonne	Geneva	*c.*1250/*early 14th cent.*	Leroquais, *Bréviaires*, no. 631
F-Pn lat. 16308	Breviary	Sorbonne	Paris	*c.*1300/*early 14th cent.*	Leroquais, *Bréviaires*, no. 632
F-Pn lat. 16309	Breviary	Sorbonne	Saintes	late 13th cent./?	Leroquais, *Bréviaires*, no. 633
F-Pn lat. 16311	Psalter-hymnary	Sorbonne	Paris	13th cent./*?*	Leroquais, *Psautiers*, no. 352

Table 3: Identified Liturgical Books from Parisian Colleges

A rubric in the thirteenth-century Parisian missal F-Ps 1220 bequeathed to the *Collège des Cholets* in 1422 mentions the performance of *organum* during the procession after Terce on the day of the Nativity of the BMV.[80] This rubric does not prove that *organum* was actually performed in the chapel, for this manuscript reached the college library at a late date and was not originally composed for the specific use of the collegial chapel.

[80] 'Ad processionem Responsorium *Solem* et organizatur Versus ante crucem.' (F-Ps 1220, fol. 469r).

As with other religious institutions, voluntary gifts also nurtured the cultivation of music and liturgy in the Parisian colleges. Besides the annual, bi-annual, weekly or even, in certain cases, daily memorial services for the founder of the college there were also the many and various endowments made by all sorts of benefactors (widows, former fellows, high-ranking clergymen, members of the aristocracy). These personalised *post-mortem* commemorations adorned the greater and lesser feast days of the liturgical year.[81] These benefactions sometimes included carefully orchestrated processions. Astrik Gabriel has, for instance, vividly described the *Inviolata* and Easter processions organised for the boys of the *Collège de l'Ave Maria*.[82] On the day of the death of the founder, the members of the *Collège de Bayeux* would go in procession to the church of Saint-Severin.[83] The processional of the *Collège de Navarre* indicates that the scholars went to the altars dedicated to St. Catherine and St. Louis in Notre-Dame on the days when the two saints were celebrated.[84] A fourteenth-century calendar missal from the *Collège des Cholets* mentions various processions to the altars of Notre-Dame and of several neighbouring churches, e.g. Saint-Etienne-des-Grès, Saint-Julien-le-Pauvre and Saint-Jean-de-Latran, on the eve and the day of the feast of St Stephen.[85] Again, there is no mention of polyphony for these processions and more generally for the *post-mortem* commemorations celebrated in Parisian colleges.

Turning away from the statutes and the surviving liturgical sources, financial documents represent a particularly untapped source likely to yield insightful information about ecclesiastical and musical life in Parisian colleges in general and about the cultivation

[81] See for instance the numerous obits added in the margins of the thirteenth-century missal F-Ps 177 which belonged to the *Collège des Cholets*. See also the list of endowments for the *Collège de Dormans-Beauvais* given by Chapotin, *Dormans-Beauvais*, 148-155; the calendar-obituary of the Sorbonne edited by Glorieux, *Aux origines*, I, 156-179; and the short notices on the Parisian colleges in *Obituaires de la province de Sens*, ed. A. Molinier (Paris, 1902), I/2, 737-783.
[82] Gabriel, *Ave Maria*, 181-9 and 201-213.
[83] F-Pan, MM 346, fol. 3v.
[84] F-Pn 1123, fol. 29r.
[85] F-Ps 178, fol. 164v.

of polyphony in particular.[86] The *Collège de Dormans-Beauvais* can be singled out for its high number of surviving account books prior to 1400. These are particularly rich in payments to scribes, illuminators but also notators for the composition of new liturgical books.[87] We can assume that two notators mentioned in the account books were conversant with the craft of polyphony. In June 1378, Guillaume *machicot* at Notre-Dame received 18s. for having notated the music for the Lady mass, the Requiem mass and hymns in usage in Paris.[88] As a *machicot*, Guillaume was one of the six senior matins clerks who were employed in Notre Dame to assist the celebrating clergy but also, and prominently, to perform melismatic chant and polyphony as a soloist.[89] In 1401, the provisor of the college complained that there were not enough books in the Chapel and that the existing books were written in such small script that only one person could sing from them.[90] There followed an order for three new antiphonaries. A certain *maistre* Jehan Carmen, *cantor*, was paid two years later the significant sum of £39, 13s. for having notated the music in the three antiphonaries of a total length of 476 folios (119 quires).[91] This *cantor* can be identified with the Parisian composer Johannes Carmen, who was himself *cantor* at the Church St. Jacques-

[86] I intend to publish in a subsequent study all the entries related to music in the medieval accounts books of Parisian colleges from the Middle Ages and the Renaissance.

[87] See the numerous references gathered by E. Pellegrin ('La bibliothèque de l'Ancien collège de Dormans-Beauvais à Paris', in *Bibliothèques retrouvées* [Paris, 1988], 3-68) who mainly concentrates on book production and on the library of the college.

[88] 'Pour un psaultier ferial et les hymnes à l'usage de Paris et pour vigilles de mors et pour les messes de Notre Dame et de Requiem qui tiennent au lutrin en la chappelle a chaenne de fer escrips par Philippot de Troyes auquel l'en a livré parchemin […] et à Guillaume machicot de Notre Dame pour avoir noté les diz hymnes et messes, XVIIIs.' (F-Pan, H_3 2785[1], *a.*1377-1378, fol. 79r).

[89] On this, see Wright, *Notre-Dame*, 24, 99 and 318.

[90] 'il n'a pas assez de livres en la chappelle car il n'a y a que un breviaire de quoy on se puisse aidier bonnement car les autres sont de lettre trop menue et n'y peut chanter que une personne.' (F-Pan, H_3 2785[5], *a.*1401-1402, [fol. 39v]; also quoted in Pellegrin, 'La bibliothèque', 37). According to an inventory from 1384, the chapel of the college counted 16 volumes of which only 7 were notated: one Parisian missal, two breviaries, one Parisian ferial psalter, one volume comprising the Vigils and one volume containing 'vigiles nottées avec les venitez et antheines de Nostre Dame' (F-Pan H_3 2785[2], *a.*1383-1384, [fol. 19v]).

[91] 'Item maistre Jehan Carmen, cantor […] pour avoir noté les antiphoniers dessus diz esquelz a VI^{XX}IIII cahiers […] rabattu pour les briefs trois volumes 5 caiers demeurant 119 caiers au pris dessus dit XXXIX£ XIIIs.' (F-Pan, H_3 2785[5], *a.*1403-1404, fol. 39r). It is noteworthy that Johannes' salary amounted to about one third of the total cost for the three books (£118 16s). In fact, only the scribe, Hervé Guillot, gets more than Johannes (£49 12s), the rest being shared between the illuminator, the rubricator, the *réeur* and the binder.

de-la-Boucherie.[92] This piece of evidence incidentally indicates that notating music was a source of revenue even for major composers such as Johannes Carmen.[93]

The books notated for the college by Guillaume Machicot and Jehan Carmen probably did not contained anything other than chant. However, another record constitutes a compelling piece of evidence regarding the possible practice of polyphony in the chapel of the *Collège de Dormans-Beauvais*. In 1398, an unidentified notator received a payment of 26s. for having added twenty folios containing various *motez, balades et antheines*, to one of the books of the collegial chapel.[94] What kind of musical repertoire lies behind this succinct reference? Who was singing this new repertoire and on which occasions?

The *antheines* may refer to polyphonic settings of the votive evening antiphons sung in the college immediately after Compline as part of a daily memorial to the Virgin Mary which comprised an antiphon, a versicle and an orison.[95] Interpreting the terms *motez* and *balades* is more problematic. *Motez* could refer to Latin or even French devotional motets but one should note that mass-movements were also often described as 'motets'.[96] However, Latin Marian motets would have been particularly well fitted for the chapel of the College, a religious institution where the cult of Mary was of particular importance.

The reference to *Balades* suggests that French lyrics could have been sung in the chapel. It is worth noting that the *Collège de Dormans-Beauvais* was one of the rare Parisian colleges which had not explicitly levied restrictions against the use of vernacular

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[92] On Johannes Carmen see C. Wright, *Music at the Court of Burgundy (1364-1419)* (Henryville, 1979), 158-161 and 168-9.

[93] For another mention of Carmen's activity as notator in 1394 in the Hospital of Saint Jacques aux Pélerins, see R. and M. Rouse, *Manuscripts and their Makers. Commercial Books Producers in Medieval Paris, 1200-1500* (Turnhout, 2000), II, 65.

[94] 'Item pour avoir fait adjousté à un livre de la chappelle certains motez, balades et anthienes et y a xii feuillets […] XXVIs.' (F-Pan, H_3 2785[4], fol. VIII[XX]).

[95] See Appendix A. Several examples of this repertoire of polyphonic Marian antiphons survive in English sources, see P. Lefferts, 'Cantilena and Antiphons: Music for Marian Services in Late Medieval England', *Current Musicology*, 45/47 (1990), 270-3.

[96] For instance, the so-called Trémoïlle manuscript (F-Pn n.a.f. 23190) is described in the 1420 inventory of the chapel of John the Fearless as a large book containing many *motez, virelaiz et balades*. It actually contained French and Latin motets with texts on various topics (Marian, devotional or political) as well as mass movements, virelais, ballades and rondeaux. For a detailed reconstruction of this manuscript, see M. Bent, 'A Note on the Dating of the Trémoïlle Manuscript', in *Beyond the Moon: Festschrift Luther Dittmer*, eds. B. Gillingham and P. Merkley (Ottawa, 1990), 217-242.

language. Furthermore, copying secular polyphony in chapel books was not an uncommon scribal practice in the fourteenth century, as the inventories of the books in the chapels of the Duke of Burgundy and the Duke of Berry indicate.[97] In several important fourteenth-century sources of *ars nova* polyphony (e.g. the Trémoïlle manuscript, F-Sm 222 C. 22 or I-IV 115), French secular pieces are interspersed between Latin motets or mass movements to fill in the blank spaces left on the page. As to the function of these pieces, an entry in the 1420 catalogue of books in the Chapel of John the Fearless tells us that ballads were among the pieces sung in the chapel on solemn feasts.[98] This seems paradoxical since only a few extant balades bore religious texts.[99] However, if 'balades' is taken here in a broader sense to include other musical forms, like the rondeau for instance, there is a possibility that the vernacular pieces contained in the book of the *Collège de Dormans-Beauvais* could have been performed during Miracle plays such as the dramatized *Miracles de Notre-Dame*.[100] Unfortunately these issues related to the genre and function of the polyphonic repertoire added in the chapel book of the *Collège de Dormans-Beauvais* must be left in suspension, alongside problems concerning the style (homophony, elementary counterpoint, up-to-date *ars nova* polyphony) and notation (mensural, partly mensural or non-mensural) of this repertoire.

Finally, there remains the question of who performed this polyphonic repertoire in the chapel. It is most unlikely that the young grammar scholars carried out this duty. We have seen that no formal musical instruction was offered in the college and the liturgical duties of the young fellows were confined to a daily memorial to the Virgin and to the

[97] See G. Doutrepont, *Inventaire de la librairie de Philippe le Bon (1420)* (Bruxelles, 1906), 27-9; and for the Duke of Berry, Delisle, *Le cabinet*, III, 193.
[98] 'Item ung autre livre de motetz, patrems, virelaiz, balades et autres choses, où l'en chantoit aux grans festes en la chapelle' (Doutrepont, *Inventaire*, 28).
[99] N. Wilkins, 'The Late Medieval French Lyric: With Music and Without Music', in *Musik und Text in der Mehrstimmigkeit des 14. und 15. Jahrhunderts*, eds. U. Günther and L. Fischer (Kassel, 1984), 161.
[100] On the performance of French lyric during miracle plays see N. Wilkins, 'Music in the *Miracles de Nostre Dame*', *MD*, 28 (1974), 39-75.

recitation of the Vigil of the Dead on Sundays.[101] However, the *Collège de Dormans-Beauvais* was one of the few collegial institutions to have endowments for a fairly large contingent of celebrating clergy (4 chaplains and 2 clerks) who lived in a separate building from the fellows. Thus, the college had at its disposal a personnel informed in and sufficient in number for the performance of polyphony.[102]

In sum, apart from the succinct record of the payment for the copying of polyphonic pieces in the account books of the *Collège de Dormans-Beauvais*, evidence for the practice of polyphony in the chapels of Parisian Colleges in the thirteenth and fourteenth centuries is non-existent. One could argue that this has to do with the patchy state of preservation of most college records prior to 1400. Had the surviving documentation been more extensive, one would have been able to gain a clearer insight into the musical life in college. Yet, it should be noted that the absence of advanced musical instruction readily accessible to the fellows, the relative silence of extant liturgical sources about collegial polyphony as well as the fact that only a handful of colleges had more than one or two professional clergyman to carry out the religious duties, make a strong case against the flourishing of polyphonic practices in the Parisian colleges.

A final argument in favour of the practice of Latin or vernacular polyphony in Parisian colleges could be set forth. Polyphony may have been composed and performed outside the chapels, as part of postprandial recreations which took place in the fellows' quarters, the halls and exiguous gardens of the colleges. Such a practice is attested, for instance, at Queen's College, Oxford, where the fellows were only allowed to play musical

[101] See the 1370 Statutes of the college (F-Pan, MM 356, fol. 2r). In 1386 the Vigil of the Dead were added in one breviary 'pour les enfans ad fin qu'il aient cause de mieulx et plus diligemment savoir leurs vigiles.' (F-Pan H_3 2785^3, fol. 10r; also quoted in Pellegrin, 'La bibliothèque', 36). In 1399 a prayer book was chained in the chapel for the benefit of the fellows: 'Item pour estre les Heures de Notre Dame et les vigiles et plusieurs belles oroisons qui sont enchainniées et mises es escoliers des bourses pour dire ycelle heures et vigiles' (Ibid., fol. 210v; also quoted in Pellegrin, 'La bibliothèque', 36).
[102] On the size of the celebrating clergy in the Colleges see Appendix A.

instruments in Hall after dinner.[103] However tempting, such a hypothesis is hindered by three major stumbling blocks.

Firstly, Latin was the only authorised language of communication in a large majority of colleges. Other languages were tolerated only to talk to the servants (e.g. *Collège du Plessis* or *Collège d'Uppsala*) or in private (e.g. *Collège de Maître Gervais*).[104] No doubt such a regulation constituted a major hindrance for the free and creative cultivation of secular music and poetry.

Secondly, interdictions were often levied against recreational musical activities for fear that they disturb the quietness and studiousness of the collegial environment. Collegial authorities unequivocally forbade singing or talking loudly at all times, even in the fellows' private lodgings.[105] The fear of disrupting the ambient tranquillity went so far that the chaplains of the *Collège du Plessis* celebrated the daily service *submissa voce* on schooldays lest they perturb the academic activities in session within the college.[106] In contrast with their Oxonian counterparts, however, Parisian secular colleges did not explicitly outlaw musical instruments. In fact, only the regular colleges implemented regulations on this aspect of musical life. The Benedictine *Collège de Marmoutier* (Statutes, 1390) prohibited the playing of *cithara*, *choro uel aliis instrumentis sonoris*, and the Cistercian *Collège de Saint-Bernard* (Statutes, 1335) any *instrumentis musicalibus*.[107] Yet, knowing how the

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[103] 'Et quoniam solet frequentia instrumentorum musicorum levitatem et insolentiam quam pluries provocare occasionemque afferre distractionis studi et profectu, huiusmodi instrumentorum usum infra suum mansum, nisi temporibus communis solatii, scholares praedicti omnino sibi noverint interdictum'. (*Statutes*, Queen's College, I, 18; see also Carpenter, *Universities*, 82).

[104] On the use of Latin in the colleges see Lusignan, 'Collèges', 47 and 53-4; for the *Collège d'Uppsala* see *Svenskt Diplomatarium. Diplomatarium Suecanum*, ed. J. G. Liljegren (Stockholm, 1829), II, 122.

[105] 'Nullus in ferialibus diebus in domo uel gerdino cantet.' (Statutes of the *Collège d'Uppsala*, *a.* 1292; Liljegren, *Svenskt*, II, 121); 'Nullus cantet uel ita alte loquatur quod impediat socios ad studendum.' (Statutes of the *Collège de Bayeux*, *a.* 1315; Félibien, *Histoire*, V, 628); 'Nullus cantet uel ita alte loquatur in camera sua quod impediat socios suos ad studendum uel ad dormiendum.' (Statutes of the *Collège de Fortet*, *a.* 1396; R. Busquet, 'Etude historique sur le Collège de Fortet', *Mémoires de la Société de l'Histoire de Paris et de l'Ile-de-France*, 34 [1907], 147). See also the *Collège du Plessis* (Statutes, *a.* 1327; Félibien, *Histoire*, III, 386), the *Collège de Tours* (Statutes, *a.* 1333; Félibien, *Histoire*, III, 419) and the *Collège de Boissy* (Statutes, *a.* 1366; Féret, *La faculté*, III, 614).

[106] Félibien, *Histoire*, III, 374.

[107] Félibien, *Histoire*, III, 397 and 167. The 'choron' (*chore*) mentioned in the statutes of the *Collège de Marmoutiers* is a stringed instrument which consist in two strings stretched over a long hollow piece of wood

Parisian collegial authorities abhorred tumult and excessive noise, it seems unlikely that instrumental music was encouraged within the secular institutions.

Finally, social contact with the external world was strictly monitored. Collegial authorities implemented numerous coercive measures that aimed at isolating the fellows so that they could focus their minds and their energy exclusively upon the performance of their liturgical and academic duties. A special licence from the headmaster or procurator was required for the admission of extraneous people.[108] Such great suspicion of anyone from the outside starkly contrasts with the seemingly open attitude in other institutions such as the Sainte-Chapelle where the choirboys were encouraged to receive extraneous musicians to perfect their musical skills and learn new repertoire.[109] Collegial authorities not only controlled the intrusion of foreign elements within the colleges but also the wanderings of the fellows in the external world of the city. The fellows had to leave for the lectures and sermons at the right time and to come back to the college immediately after these. The aim of such tight control was to reduce the risk of wanton behaviour, lascivious actions and other sinful misdemeanours. On other occasions, they also had to ask permission to venture out in the urban jungle. This permission was granted only for a very good reason. The ferule and a temporary suspension of the *bursa* was the logical consequence of any infringement of these widely implemented rules. Repetition of the offence eventually led to exclusion from the college.[110]

The governing bodies of certain colleges also attempted to control the musical pursuits of the fellows outside the walls of the *domus*. The fellows of the *Collège de Narbonne* (Statutes, 1371) were heavily fined (5 s.) if caught engaging in 'chorea, cantus,

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and struck with a stick. For literary references to the 'choron' see A. Pirro, *Histoire de la musique de la fin du XIV^e^ siècle à la fin du XVI^e^ siècle* (Paris, 1940), 12-3.

[108] See for instance the statutes of the *Collège de Fortet* (Busquet, 'Etude', 148) or of the *Collège de Navarre* (Du Boulay, *Historia*, IV, 79).

[109] 'Et combien qu'il soit aucune foiz expedient que les enfans oyent chanter des gens de hors, car il pueent bien aucune chose aprendre et aussi les autres appreendre à eulz' (Brenet, *Les musiciens*, 18).

[110] See for example the statutes of the *Collège de Harcourt* (Statutes, *a*. 1311; Du Boulay, *Historia*, IV, 158), of the *Collège de Tours* (Félibien, *Histoire*, III, 410) and of *Collège de Dormans-Beauvais* (F-Pan, MM 356, fol. 3v).

octave, fistule, clamores et alii graves strepitus uel insultus'.[111] Attendance at carols, even those organised by a nation of the University on the day of the feast of its patron saint were strictly forbidden to the members of the *Collège de Maître Gervais* and *Collège de Harcourt*.[112] The *College de Navarre* banned improper plays on the days of the feasts of St Catherine and St. Nicholas, the two much-celebrated patron saints of medieval students.[113] Similarly, the fellows of the *Collège de Cornouailles* caught either inside or outside the college 'in ludo mimorum, joculatorum, histrionum, goliardorum et consimilium' incurred severe punishments.[114]

The confluence of these proscriptive and highly limiting measures regarding the recreations and the circulation of the fellows of Parisian colleges is highly suggestive. It seems unlikely that recreational gatherings of learned musicians conversant with the craft of polyphony ever took place within the colleges. After all the primary function of these educational institutions was to provide a pious and studious environment for young scholars so that, escaping the inevitable material difficulties concomitant to student life, they could obtain their degrees more easily. Had collegial authorities be more intent on encouraging the development and performance of polyphony, such endeavours would have been more apparent in the extant records from Parisian colleges.

Polyphony for the pueri*?*

The relative absence in the extant records of the Parisian University and colleges, of references to instruction in the practical areas of the performance and notation of polyphony

[111] Félibien, *Histoire*, V, 669.
[112] Respectively: 'Nullus vadat ad choreas extra domum in qua moratur nec ad coreas nacionis nec alias quovismodo' (Féret, *La faculté*, III, 652); 'nec aliqui de domo vadant de nocte ad choream uel processionem nationis' (Du Boulay, *Historia*, IV, 159).
[113] 'Item in festis S. Nicolai et B. Katharinae nullum ludum inhonestum faciant nec domum exeant nec extraneos recipiant nec admittant' (Du Boulay, *Historia*, IV, 93). On the eve and the day of the feast of St. Nicolas was held the famous celebration of the Boy Bishop, a time of revelry and social inversion. For further details on this colourful celebration see E. K. Chambers, *The Mediaeval stage* (Oxford, 1935), I, 336-363.
[114] Félibien, *Histoire*, V, 504.

makes even more perplexing and disconcerting the search for the institutional context in which *musica mensurabilis* flourished. Having also noted the lack of university-related documents regarding practical musical instruction, Max Haas doggedly argued that such instruction took placed outside the University and was in fact carried out in preparatory schools; the boys, aged between 7 and 14, learned the craft of polyphony prior to their entry in the Arts faculty.[115] Even though Haas' hypothesis is plausible, he does not bring forth conclusive evidence to support it. The puzzle is none too simple.

That music or rather chant was one of the first disciplines taught during childhood need not be discussed. Since Charlemagne's *Admonitio generalis* of 789, if not before, through to the end of the Middle Ages and even later, the education of children in monastic, cathedral and other urban schools started with learning the rudiments of Christian religion, of chant and of Latin language.[116] In the early eleventh century, Guido of Arezzo devised a chant theory manual for the *pueri*, the *Micrologus*, which was still in use in Paris in the thirteenth and fourteenth centuries.[117] The idea that music ought to take part in the shaping of young minds received further confirmation with the reception of Aristotle's *Politics* in the second half of the thirteenth century, where Aristotle described *musica practica* as a *scientia delectabilis* necessary for the good education of the future citizens.[118] But did this pre-Arts *musica practica* training include, as Haas thought, learning the practice and notation of *musica mensurabilis* with the help of such primers as Johannes de Garlandia's *De musica mensurabili*, Franco of Cologne's *Ars cantus mensurabilis*, or any of the *ars nova* treatises commonly associated with the name of Philippe de Vitry?

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[115] See notably Haas, 'Studien', 367-370; Id., 'Musiklehre', 113-116; Id., 'Les sciences mathématiques (astronomie, géométrie, arithmétique, musique) comme parties de la philosophie', in *EPTS*, 99-101.

[116] See for instance P. Riché, *Les écoles et l'enseignement dans le Haut Moyen Âge* (Paris, 1989), 43-76; N. Orme, *English Schools in the Middle Ages* (London, 1973), 62-9; and the beautifully illustrated volume by J. Smits van Waesberghe, *Musikerziehung. Lehre und Theorie der Musik im Mittelalter* (Leipzig, 1969).

[117] On the reception of Guido's *Micrologus* in the Middle Ages, see W. Hirschmann, *Auctoritas und imitatio. Studien zur Rezeption von Guidos* Micrologus *in der Musiktheorie des Hoch- und Spätmittelalters* (Unpublished Habilitationsschrift, University of Erlangen, 1999).

[118] Aristotle, *Politics*, VIII, 3-5, particularly 1335b33-5 and 1340b3-9. This passage is referred to in the proem of an anonymous thirteenth-century commentary on Priscian's *Institutiones grammatice* quoted by Haas ('Studien', 369).

Answering this question is no easy task, for surviving documentation about the overall functioning of elementary music schools in Paris is non-existent. To that extent we may assume that a senior cathedral officer exercised authoritative power only over musical instruction in the diocese as was the case in other Northern French Cathedrals. In Noyon, for instance, no one could open a school, even a chant school (*schola cantus*), without the assent of the *scholasticus* of the Cathedral and in Amiens, it was the Cantor's responsibility to oversee the music schools.[119] In Paris, this responsibility was definitely not incumbent upon the Cantor, who already administered the grammar schools.[120] The designated candidate for such a task could have been the Succentor, who was the senior officer in charge of the musical aspects of the cathedral's ritual and ceremony, but there is no evidence of this.[121]

The oft-quoted reference from the *Règles de la Seconde rhétorique* to the music school of Jehan Vaillant *c*.1370 in Paris is here of little help, for it says nothing about the people who frequented this school or about what was taught. Vaillant may have been an expert in string instruments for a treatise on tuning now part of the compilation US-Bem 744 may be ascribed to him.[122] More likely, a recently discovered Hebrew treatise on mensural proportions based on Vaillant's teachings suggests that the latter *escolle de musique* may have indeed offered instruction in polyphony of the most innovative kind.[123] But to whom?

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[119] For Noyon, see the charter from *c*.1260 in the cartulary of the Cathedral which describes in detail the office of *scholasticus*: 'Insuper dictus scolasticus non debet sustinere quod aliquis de aliqua facultate legat, uel quod scolas teneat in tota civitate uel in aliqua villa infra comitatum Noviomensem nisi de eius licentia speciali. Ita solet esse de scolis cantus […].' (Beauvais, Archives Départementales de l'Oise, G 1984, fol. 59v). For Amiens, see G. Johnston, *Aspects of Late Medieval Music at the Cathedral of Amiens* (Unpublished Diss., Yale University, 1991), 55-7.

[120] See the statutes regulating the grammar schools issued in 1357 by the Chantry of Notre-Dame. The text is notably edited in Félibien, *Histoire*, III, 447-8 and in *CUP*, III, no. 1237.

[121] On the role of the Succentor at Notre Dame see Wright, *Notre Dame*, 20-22.

[122] See C. Page, 'Fourteenth-Century Instruments and Tunings: A Treatise by Jean Vaillant (Berkeley MS 744)?', *The Galpin Society Journal*, 33 (1980), 17-35.

[123] See notably U. Günther, 'Jehan Vaillant', in *Speculum musicae artis. Festgabe für Henrich Husmann* (Munich, 1970), 171; Meyer, 'L'enseignement', 306; and I. Adler, who edits the Hebrew treatise from I-Fn Magl III 70, fols. 1ra-4rb in *Hebrew Writings Concerning Music*, *RISM* BIX/2 (Munich, 1975), 55-66.

Another reference to a Parisian music school, hitherto unnoticed, seems slightly more suggestive. In 1375, the governor of the Hospital Saint-Jacques-aux-Pélerins and Royal counsellor, Philippe Giffart, made a provision to send four clerks of the hospital to an *escole de chant*.[124] Another record indicates that the clerks soon found a music teacher, an otherwise unknown *maistre* Jehan de Launay who, in 1377, was paid the sum of 73s. 'pour apprendre les iiii clercs de l'opital à deschanter'.[125] Thus, the governing authorities of the hospital paid a music master to teach their chapel clerks not chant, but part-singing, or more specifically, as the term *déchanter* of the account entry seems to indicate, the specific technique of *discantus*, that is, a technique of adding vocal parts to a *cantus firmus* in accordance with the rules of counterpoint.

Two aspects are of interest here. Firstly, religious institutions could contract for a fixed term freelance music teachers to offer complementary training to their personnel.[126] This precision allows us, in retrospect, to interpret the reference quoted above about the two *magistri in arte musice* listed in the rotulus of supplication of the University of Paris as another example of such indenture.[127] With this in mind, it would appear as though a music school should be conceived of less as an institution following a year-long, clearly structured academic schedule, as was the case with the University or even with the grammar schools, than as a flexible and versatile learning environment supervised by a master who fashions a short-term course to coincide with specific needs and demands. A document issued by the chapter of Noyon *c.*1260 corroborates this view by incidentally indicating that music

[124] 'Item donne aux quatre clercs de céens pour aler a l'escole de chant xxxii s.' (Paris, Archives de l'Assistance Publique de Paris, fonds Saint-Jacques-aux-Pélerins [hereafter APSJ], liasse 108, fol. 4v). For a detailed description of the archives of the Hospital Saint-Jacques-aux-Pélerins see H. Bordier, *Les archives hospitalières de Paris* (Paris, 1877).
[125] Paris, APSJ, liasse 113, fol. 35r.
[126] See the examples of English monasteries hiring professional polyphones gathered by F. L. Harrison, *Music in Medieval Britain* (London, 1958), 40-43.
[127] See above, 245-6.

schools were held in the diocese for a limited time and that they especially flourished during Lent.[128] This may also have been the case in Paris.

That Lent was the privileged period of the liturgical year for the establishment of music schools may at first seem paradoxical. This could be explained by the fact that during Lent, liturgical music was confined to a minimum. The professional singers of churches, private chapels and other ecclesiastical institutions would have had more time to set up or to attend music schools. Lent must have been a period particularly rich in musical activities because from the early fourteenth century onwards, professional entertainers from all around Europe journeyed towards Northern French and Flemish urban centres during that period to attend the famous 'minstrel schools' where they learned new repertoire.[129]

Secondly, even though it is difficult to ascertain the age of the clerks sent to the school of Jehan de Launay, an earlier statute of the Hospital (1331) specified that the chapel clerks were to have a firm grasp of Latin and a good knowledge of liturgy.[130] We should then picture these clerks as teenagers rather than as young boys, freshly unfettered from their swaddling clothes.

One may object that around the middle fourteenth century the young choirboys of the Sainte-Chapelle were encouraged to learn 'motets, balades and similar things' or that around the beginning of the fifteenth century, the choirboys of Notre-Dame could sing *discanti honesti*.[131] In addition, in Oxford, the educational program devised in 1340 by the founder of Queen's College for the six poor choristers of the College clearly stipulated that prior to their entry into the Arts faculty, the young choristers would receive, when a fittingly

[128] '[…] de scolis cantus in quadragesima uel in alio anni tempore, quando scolares Noviomenses ad scolas cantus voluerint se conferre.' (Beauvais, Archives Départementales de l'Oise, G 1984, fol. 59v; charter establishing the *scholasticus* as head of the schools).
[129] See M. Gomez, 'Minstrel Schools in the Late Middle Ages', *EM,* 18/2 (1990), 212-216.
[130] Bordier, *Les archives*, 31.
[131] See above, 252-3.

competent tutor was available, some training in 'measured music' (*cantu mensurato*).[132] The Collegiate Church of Ottey St. Mary also provided *c*.1340 instruction *in cantu organico et organicis instrumentis* to its choristers.[133] Finally, at the end of the fourteenth century and the beginning of the fifteenth century, prominent composers of polyphony such as Jean Tapissier, Nicolas Grenon or Jean Cesaris taught music to the choirboys of the chapels of the Dukes of Burgundy and the Duke of Berry as well as to those of important cathedral centres such as Laon and Cambrai.[134] Such teaching may have included the practice and notation of measured polyphony.

The evidence mustered here brings support to Haas' hypothesis. Yet, several caveats must be brought forth. Firstly, that composers held the position of master of music of the choirboys in several Northern French institutions does not imply that teaching measured music and polyphony was part of their duties. Secondly, since all these references to the teaching of polyphony to choirboys date from the second half of the fourteenth century it is uncertain whether such an educational practice can be traced back to the thirteenth century. Finally one should keep in mind that *musica mensurabilis* presupposed a solid foundation in chant and also, probably, in non-written polyphonic techniques such as fifthing, parallel *organum* and *discantus* which helped one become familiar with the practicalities of part-singing. Thus, it is likely that the choirboys of the aforementioned institutions started to learn rhythmic notation at the latest stage of their musical training, that is, in their early teenage years. The situation in fourteenth-century France was probably very similar to that in England during the same period. As was brilliantly demonstrated by Roger Bowers, it is not before the second half of the fifteenth century that the boys of most English

[132] 'Voloque quod praedicti pauperes post solidam fundationem in grammatica ac competentem informationem in cantu plano et in super quantum bono modo fieri poterit mensurato, solum dialecticae et philosophiae intendant' (*Statutes*, Queen's College, 31).
[133] See Harrison, *Music*, 19.
[134] For a short biographical notice on these composers see Wright, *Burgundy*, 169-180.

ecclesiastical institutions became involved in the performance of measured polyphony and were, as a result, systematically taught *musica mensurabilis*.[135]

A look at the intended audience of thirteenth-century and fourteenth-century *musica mensurabilis* treatises corroborates this. Most treatises are addressed to an audience of *juvenes*, contrasting with chant theory treatises, usually dedicated to *pueri* or *parvuli*.[136] *Puer* and *juvenis* correspond to specific age groups. In medieval medical and pedagogical sources, *pueritia* approximately ranges from birth or age 7 to age 14, and *juventus* from age 14 or sometimes 20 to, as old as age 40.[137] Therefore *juvenis* stands for teenagers or more mature adults.

Even though in some institutions, choirboys could be initiated into the rudiments of measured music, it would seem that, overall, the primary audience for *musica mensurabilis* lectures consisted of young people. One institution in medieval Paris comprised a large and youthful population, craving for knowledge, namely the Arts faculty. Although the authorities of this institution did not, as we have already seen, officially encourage the instruction of polyphony, the latter could well have been dispensed to its members in a more informal way. The final part of the present chapter will explore precisely this possibility by trying to establish whether the music treatises on *musica mensurabilis* produced in Paris during the thirteenth century can be seen as emanations from the Arts faculty and its intellectual orientations.

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[135] R. Bowers, 'The Performing Ensemble for English Church Polyphony *c.*1320-1390', in *Studies in the Performance of Late Mediaeval Music*, ed. S. Boorman (Cambridge, 1983), 178-9.

[136] Anonymous of St. Emmeram, *De musica mensurata*, 288; Johannes de Muris, *Notitia artis musicae*, 106; Ps.-Franco, *Compendium discantus*, ed. G. Reaney, *CSM* 36 (n.p., 1996), 50; Jacobus Leodiensis, *Speculum musicae*, VII, 1, pp. 5-6; Johannes Boen, *Ars (musicae)*, 27 and 39; Johannes de Grocheio, *De musica*, 41; Heinrich Eger von Kalkar, *Cantuagium*, 67; Petrus dictus Palma ociosa, *Compendium de discantu mensurabili*, ed. J. Wolf, in 'Ein Beitrag zur Diskantlehre des 14. Jahrhunderts', *Sammelbände der Internationalen Musikgesellschaft*, 15 (1913-14), 517; Anonymous Berkeley, *Musica*, ed. and trans. O. Ellsworth (Lincoln, 1989), 184. For chant treatises see Amerus, *Practica artis musice*, ed. C. Ruini, *CSM* 25 (n.p., 1977), 19-20; Elias Salomon, *Scientia artis musicae*, in *GS*, 3, 27; Guido de Sancto Dionysio, *Tractatus de tonis*, ed. S. van de Klundert (Bubenreuth, 1998), II, 2; Henricus Helene, *Summula musicae*, fol. 11v.

[137] For various medieval views on this matter see D. Lett, *L'enfant des miracles. Enfance et société au Moyen Age (XII^e et XIII^e siècles)* (Paris, 1997), 50-51.

Aristotelian philosophy, the Arts faculty and the Theory of *Musica Mensurabilis*

In a famous passage, the music theorist Anonymous IV narrates how in the early stages of Notre-Dame polyphony, facing undifferentiated note-shapes on the page, singers inferred rhythmic values in performance from the succession of harmonic intervals, lengthening consonances and shortening dissonances. The rule of consonance was therefore at the heart of the determination of rhythm, and learning the rhythmic contour of a part was done essentially by imitation: 'audiatis nos et retineatis.'[138] Gradually, note-values were differentiated on the page by specific note-shapes and rules of syntactical combination known as the rhythmic modes.[139] If the teaching of this method of notating rhythm was originally oral, judging from the extant music treatises, these bookless times ceased *c.*1260 when Johannes de Garlandia penned his *De mensurabili musica*, the first extant extensive description and codification of the system of the rhythmic modes. Within the next three or four decades that followed, a cluster of four other treatises on rhythmic notation, all but the last written in Paris, flourished: in an alleged chronological order, Lambertus' *Tractatus de musica* (*c.*1270), the Anonymous of St. Emmeram's *De mensurata musica* (1279), Franco of Cologne's *Ars cantus mensurabilis* (*c.*1280) and Anonymous IV's *Musica* (*c.*1300).[140]

Author	Form	Length (no. of words)	Notated musical examples	Extant manuscripts	Number of versions
Johannes de Garlandia	Prose	6,000 words	63	3	2 (2nd probably inauthentic)
Lambertus	Prose with a few	10,000	104 (70 on *musica*	4	4

[138] Anonymous IV, *Musica*, I, 50 and Reckow's commentary in *Der Musiktraktat*, II, 44-45.
[139] For tentative reconstructions of the emergence of *musica mensurabilis* see E. Roesner, 'The Emergence of *Musica Mensurabilis*', in *Studies in Musical Sources and Style. Essays in Honour of Jan Larue*, eds. E. Wolf, E. Roesner (Madison, 1990), 41-74; E. Sanders, 'The Earliest Phases of Measured Polyphony', in *Music Theory and the Exploration of the Past*, eds. C. Hatch and D. W. Bernstein (Chicago, 1992), 41-58.
[140] The dates of some of these treatises are still problematic. On questions of chronology see J. Yudkin, 'The Influence of Aristotle on French University Music Texts', in *MTIS*, 181; W. Frobenius, 'Zur Datierung von Francos *Ars cantus mensurabilis*', *AfM*, 27 (1970), 122-127; M. Huglo, 'De Francon de Cologne à Jacques de Liège', *RBM*, 34-35 (1980-81), 44-60.

	didactic verses		*mensurabilis*)		
Anon. of St. Emmeram	Glossed poem in leonine verses	38,000	150 (123 on ligatures)	1	1
Franco of Cologne	Prose	4,000	83	6	1
Anon. IV	Prose (abbreviation ?)[141]	20,000	None	3	1

Table 4 : Formal Aspects of Thirteenth-Century Musica Mensurabilis Treatises

Despite marked disparities in length, diffusion and overall form (see Table 4), these four treatises are greatly indebted to Johannes de Garlandia's *De mensurabili musica* and show a close interdependence from the points of view of the layout, content and terminology.[142]

For many modern scholars, two other aspects help strengthen the interrelationships between these five Parisian treatises: an unprecedented use of scholastic methods of discursive analysis and exposition, and the incorporation of Aristotelian concepts and terminology.[143] Because Aristotelian philosophy and scholastic method characterised the educational program and intellectual activities of the Arts faculty, the Parisian *musica mensurabilis* treatises could now be seen as products of this institution. Is this truly the case? Can the five music treatises be regarded as the consequence of an 'informal teaching' of *musica mensurabilis* held in the intellectual circles of the Arts faculty? What exactly is the nature of the philosophical import in these treatises? Answering these thorny questions implies the recontextualisation of each treatise. Such recontextualisation will be achieved by reconsidering the individuals who wrote the five treatises, their intended audiences, the modes of expositions chosen, and finally the nature and scope of the borrowings from Aristotelian philosophy.

[141] According to Edward Roesner ('Who Made the *Magnus Liber*', *EMH*, 20 (2001), 229), the presence of numerous 'et cetera' breaking paragraphs mid-sentence indicates that the extant text of the Anonymous IV may be an abbreviated version of a longer treatise.
[142] See Yudkin, 'The Influence', 185-188.
[143] See Gushee, 'Questions of Genre', 424-433; Reckow, *Der Musiktraktat*, II, 65-67; Haas, 'Die Musiklehre', 129-153; Yudkin, 'The Influence', 181-189.

The shroud of anonymity which envelops thirteenth-century Parisian music theorists makes it impossible to establish definitive links between the individuals who wrote these five treatises and the Arts faculty of Paris. Biographical details about Johannes de Garlandia, Lambertus, Anonymous IV, the Anonymous of St. Emmeram and Franco are extremely sparse and identifications have hitherto been tentative, to say the least. Johannes de Garlandia has been unsuccessfully identified with the famous English Grammarian of the same name and, more recently, with a *librarius* of the University of Paris active at the beginning of the 14th century.[144] Jeremy Yudkin proposed to identify Lambertus with a dean of St. Vincent, Soignies, who bequeathed his goods to the Sorbonne *c*.1270.[145] He likewise established connections between the Anonymous of St. Emmeram and a canon of Notre-Dame and master at the University of Paris, Henricus Tubeuf.[146] That the Anonymous of St. Emmeram refers to Henricus as *magister noster* suggests that the former may have studied in the Arts faculty of Paris under the guidance of the latter. We know nothing of Anonymous IV except that he was an Englishman, perhaps a Benedictine monk from Bury St. Edmunds or a Dominican friar.[147] Anonymous IV's acquaintance with a vast array of scribal practices and notational styles[148] suggests that he was probably himself a notator who either travelled a lot or who had access to a rich collection of liturgical books. Finally, after several attempts at identification, Franco of Cologne remains a shadowy figure.[149]

It is true that Franco, Lambertus or Johannes de Garlandia are sometimes styled '*magister*' either in the manuscripts containing their respective treatises or in treatises by contemporary music theorists. However, this does not imply that these three individuals were in possession of a degree from the University of Paris. As was pointed out by

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[144] See R. Baltzer, 'Johannes de Garlandia', in *Grove Music Online* <http://www.grovemusic.com> [accessed 4 July 2005].
[145] J. Yudkin, 'The Anonymous Music Treatise of 1279: Why St. Emmeram?', *Music and Letters*, 72/2 (1991), 182.
[146] Ibid., 183-86.
[147] See respectively Reckow, *Der Musiktraktat*, II, 1-2; and Roesner, 'Who Made', 230.
[148] See notably the remarks in Anonymous IV, *Musica*, 41-42, 51 and 60.
[149] See Huglo, 'Recherches', 1-6.

Christopher Page, in the thirteenth century the title *magister* or *maistre* was not restricted to the sole sense 'possessor of a university degree'.[150] More generally, the term was used to denote someone who excelled in a particular craft and was capable of teaching it. For instance the Parisian masters of grammar were considered as such not because they held university degrees but because the Cantor of Notre-Dame had granted them a licence to teach after assessing their grammatical competence.[151] Similarly, a music teacher was probably styled *magister* not because he had graduated from a university but because he was officially or consensually recognized as a competent instructor in the discipline.

Considering the intended audiences of the five Parisian treatises is equally problematic. While direct references to particular audiences are absent from the treatises of Johannes de Garlandia, Lambertus and Anonymous IV, the Anonymous of St. Emmeram and Franco of Cologne are more explicit concerning the destination of their respective works. On two occasions, the Anonymous of St. Emmeram directly addresses the reader (*lector*) that he identifies as a *cantor*.[152] He also seems to consider himself a *cantor* when he affirms that issues related to the definition of the subject matter of music, to its invention or to ratio theory must be left to 'philosophers'.[153]

Franco of Cologne is even more explicit concerning the intended audience for his work. In writing the *Ars cantus mensurabilis*, Franco wanted to offer a compendium (*sub compendio*) containing the most essential rules of *musica mensurabilis* so that any student (*auditor*) or music-scribe (*notator*) might be able to learn without too much difficulty the rudiments of the discipline.[154] If the term *auditor* implies a classroom setting, the term *notator* evokes a more autodidactic form of learning. Thus, by designing an easily

[150] C. Page, *The Owl and the Nightingale. Musical Life and Ideas in France 1100-1300* (Berkeley, 1989), 146.
[151] See the 1357 Notre-Dame statutes regulating the grammar schools, *CUP*, III, no. 1237.
[152] Anonymous of St. Emmeram, *De musica mensurata*, 200 and 202.
[153] Anonymous of St. Emmeram, *De musica mensurata*, 66 and 264.
[154] Franco of Cologne, *Ars cantus mensurabilis*, 24.

understandable text suitable for a classroom as well as for a private use, Franco intended to make *musica mensurabilis* accessible to a wider audience.

Another interesting feature is Franco's indication that he wrote the *Ars cantus mensurabilis* at the 'request of certain magnates' (*ad preces quorumdam magnatum*).[155] This remark is suggestive when we know that the compilation of some of the most important extant collections of thirteenth-century polyphony could be placed within a context of courtly patronage.[156] Several fascicles (1, 7 and 8) in one of these famed collections, the Montpellier Codex (F-MO H196), are written in Franconian notation and are roughly contemporary with the *Ars cantus mensurabilis*.[157] It is now thought that the Montpellier Codex can be associated with the court of Queen Marie of Brabant (1275-1285) and her spouse King Philip III.[158] One could well hypothesize that the magnates who asked Franco to pen his *Ars cantus mensurabilis* were members of the French Royal court in Paris. It would make manifest a seemingly united effort on the part of the population of Parisian musicians and their patron to define new notational practices. Furthermore, it may not be coincidental that several motets used as examples in Franco's treatise feature in the fascicule of the Montpellier manuscript written in Franconian notation.[159] Perhaps Franco played an active role in the elaboration and compilation of the Montpellier Codex. He might also have composed some of the anonymous pieces contained in that codex including an hitherto unidentified three-part piece ascribed to him that Jacobus Leodiensis heard performed in Paris.[160] Although this tantalising possibility remains no more than an hypothesis, there is no reason to doubt that such a talented composer, notator and theorist as Franco could not have

[155] Ibid., 23. See also Huglo, 'Recherches', 13.
[156] Notably see Huglo and Haggh, 'Magnus liber', 193-202; and also M. Everist, *Polyphonic Music in Thirteenth-Century France. Aspects of Sources and Distribution* (New-York-London, 1989), 83-5, 152-3 and 171-3.
[157] According to Everist (*Polyphonic*, 121-125) fascicules I and VII of the Montpellier codex can be dated *c*.1280 and fascicule VIII *c*.1300. Mary Wolinski posits an earlier date of *c*.1270 for these fascicules, see her 'The Compilation of the Montpellier Codex', *EMH*, 11 (1992), 299-301.
[158] See C. Parsoneault, *The Montpellier Codex: Royal Influence and Musical Taste in Thirteenth-Century Paris* (Unpublished Diss., Texas University at Austin, 2001).
[159] The musical examples of Franco's treatise are analysed in Huglo, 'Recherches', 16-18.
[160] Jacobus Leodiensis, *Speculum musicae*, VII, 17, p. 38.

gravitated towards the lofty circles of the French Court, for music, as Henricus Helene later remarked, was for one a means to secure the benefactions of the magnates and to escape a dishonouring indigence.[161] In this new light, Franco's treatise appears less as a university product than as a product of courtly patronage and culture.

If the intended audiences for the five *musica mensurabilis* treatises do not explicitly point towards the University, looking at the way these texts were couched on the page may yield more clues as to their function and destination. For Jeremy Yudkin, the influence of the intellectual methods of the University is manifest in the overtly scholastic mode of exposition employed by the five authors of the treatises.[162] In fact, this affirmation needs to be nuanced. In the treatises of Johannes de Garlandia, Lambertus, Anonymous IV and Franco, the scholastic import is limited to the occasional use of basic formulae such as 'dicendum est', 'ad quod dicendum', 'sciendum est', 'nota quod', 'videndum est', 'intelligendum est', 'responsio cum probatione', 'sequitur quod' and 'ex hiis patet quod'. It should be noted that since the twelfth century these formulae were ubiquitous, appearing in an incommensurable number of writings about various disciplines and from different intellectual milieus. In the domain of music theory, Joseph Dyer demonstrated that in the thirteenth century the incorporation of scholastic formulae was neither limited to *musica mensurabilis* treatises nor geographically confined to Paris.[163] The pervasiveness of such formulae indicates that their use was automatic and even compulsive for anyone writing on a technical subject in the thirteenth century. Thus, the presence of these formulaic elements is not sufficient to secure a connection between the four aforementioned Parisian *musica mensurabilis* treatises and the University.

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[161] '[Musica] quam plurimis apud magnates necessariorum vite copiosam procuret facultatem multorumque aliunde vivere non potentium detestabilem adimit egestatem, quam plures etiam generis ac possessiorum favore denudatos, ad iocundam nobilium potentumque utriusque sexus votet societatem.' (Henricus Helene, *Summula musicae*, fol. 10v).

[162] Yudkin, 'The Influence', 183.

[163] Dyer, 'Chant Theory'. To the treatises analysed by Dyer, one could also add Henricus Helene's *Summula musicae* and Guido de Sancto Dyonisio's *Tractatus de tonis*, both of which not only display a recurrent use of scholastic formulae but also an impressive familiarity with the works of Aristotle and his Greek, Arabic and even Parisian commentators.

The situation is different in the case of the *De musica mensurata* by the Anonymous of St. Emmeram for the latter's use of scholastic method goes beyond the mere application of commonplace formulas. As we have seen in chapter 4, the Anonymous of St. Emmeram is one of the rare music theorists to incorporate in his treatise a long digression in the form of a scholastic *questio*. The polemical nature of the treatise as a virulent diatribe directed against certain theoretical positions of Lambertus, makes the dialectical format and its opposition of antagonistic views adequate. But the scholastic import of the *De musica mensurata* is not limited to this aspect. The whole treatise bears strong formal resemblance with literal commentaries on Aristotle from the Arts faculty of Paris. The treatise is cast in the form of a commentary on a poem in leonine verses, divided up into ten *lectiones*. Each *lectio* opens with a detailed *divisio textus* incorporating the *sententia in generali* of the section of the poem to be commented upon.[164] The textual division is then followed by a more detailed explanation of the *littera* introducing original digressions on notational issues and problems raised by the text. This technique of commentating on a text was precisely the one widely employed in the late thirteenth-century in literal or *sententia* commentaries from the Arts faculty of Paris.[165] However, the *lectiones* in these commentaries segment the text in logical units of meaning and are roughly of the same length corresponding to the duration of a classroom lecture. While the division into *lectiones* is modelled after the content of the poem commented upon,[166] the length of these *lectiones* varies from 1200 to 6000 words. It seems therefore unlikely that the treatise represents a written record of actual classroom lectures on *musica mensurabilis*. This confirms the idea that the same author wrote both the poem and the prose commentary.[167]

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[164] The anonymous author even concludes each *divisio textus* with a formula such as: 'Et sic patet sententia generali et divisio lectionis [*ed.* leoninis].' See Anonymous of St. Emmeram, *De musica mensurata*, 68, 82, 88, 120, 188, 194, 220, 244, 260, 272 and 282.
[165] O. Weijers, *Le maniement*, 103-112. See also above Chapter 2.
[166] Each *lectio* deals with a specific topic of *musica mensurabilis* (modes, simple figures, ligatures, rests, genres, etc.) usually treated in separate chapters in the other treatises.
[167] Yudkin, 'The Anonymous', 177-178.

So far, indisputable intellectual affinities with the University have only been found in the Anonymous of St. Emmeram. There remain to investigate the nature and scope of the import of philosophical, that is to say, of Aristotelian concepts and terminology in the five Parisian music treatises and to assess to what extent these helped shape the emergence and subsequent developments of measured music. The absence of direct and extensive quotation from Aristotle's works in these treatises[168] forces us to turn to more diffuse and allusive forms of influence. The first step to be taken is to establish whether core notions of *musica mensurabilis* theory can be considered as by-products of the debates on Aristotelian philosophy in the Arts faculty of Paris.

The result is deceptive. The terms used by music theorists to theorize rhythmic notation are too ubiquitous and the definitions given in the treatises too succinct to permit an accurate reconstruction of the conceptual soil from which these notions emerge. With such terminological elusiveness any attempt to establish secure connections between *musica mensurabilis* and University disciplines incur the risk of loose generalisations grounded on vague semantic affinities. The cases of *modus* and *tempus*, two foundational notions for measured music, are symptomatic.

All the definitions of *modus* penned in thirteenth-century *musica mensurabilis* treatises are in fact modelled after Johannes de Garlandia, who was the first music theorist to propose an extensive description of the theory of the rhythmic modes.[169] They convey a similar idea: *modus* measures musical time with determined patterns of long and short durations, that is of longs and breves. Yet the importance of *modus* was not confined to music. It was at the heart of a whole branch of medieval logic dealing with modality (necessity, contingence, possibility, impossibility, truth and falsehood) in categorical

[168] For a systematic survey of the quotation of Aristotle in late medieval and renaissance music theory treatises see C. Maître, 'La place d'Aristote dans l'enseignement de la musique à l'université', in *EDFA*, 217-233.
[169] '[Modus] appelatur quidquid mensuratione temporis, videlicet per longas vel per breves, concurrit.' (Johannes de Garlandia, *De mensurabili musica*, 37). See also Lambertus, *Tractatus de musica*, fol. 31ra; Anonymous of St. Emmeram, *De musica mensurata*, 184; Franco of Cologne, *Ars cantus mensurabilis*, 26; Anonymous IV, *Musica*, 22.

propositions.[170] It also occupies a central role in the thirteenth-century grammatical theory of the *modi significandi* which aimed at establishing universally valid analogies between reality, language and concepts.[171] Facing the ubiquitous presence of *modus*, modern music scholars attempted to establish correlations between the *musica mensurabilis* and modal logic or speculative grammar.[172] It is true that in the three disciplines the term *modus* somehow retains the general meaning of *modus* as 'manner'.[173] Yet, neither logical modality nor the theory of *modi significandi* imply the idea of measure so central to the theory of the rhythmic modes.

The association of *modus* with temporal measure is rather to be found in the medieval tradition of metrics.[174] This is not surprising since, as is well known, the whole system of the rhythmic modes precisely bears the conceptual stamp of this tradition.[175] In addition, these music theorists could have found in chant theory another occurrence of the term *modus* implying the notion of measure.[176] The eight church modes, which constituted a great bulk of the teaching of *musica plana*, were means to measure melodies with the help of a fixed scalic structure. A cognate of the term *manieres*, taken by Johannes de Garlandia as a synonym for *modus*, also appears in twelfth-century Cistercian chant theory treatises describing the melodic motions to the *finalis* proper to each mode.[177] The Anonymous of St. Emmeram also sensed an obvious parallel between the eight church modes and the six rhythmic modes when he divided the latter into three *modi autentici* and three *modi plagales*.[178] It is therefore more likely that thirteenth-century music theorists and most

[170] See S. Knuutila, *Modalities in Medieval Philosophy* (London, 1993).
[171] See the excellent study by I. Rosier, *La grammaire de modistes* (Lille, 1988).
[172] See Yudkin, 'The Influence', 183-184; Van Deusen, *The Harp*, 256-278; Tanay, *Noting Music*, 88-89.
[173] Garlandia and his followers equate *modus* to *manieres*.
[174] See notably Augustine, *De musica*, I, 15, *PL* 32, 1092; Alexander de Villadei, *Doctrinale* (*c.*1200), ed. D. Reichling (Berlin, 1893), v. 1562.
[175] L. Treitler, 'Regarding Meter and Rhythm in the *Ars Antiqua*', *The Musical Quarterly*, 65 (1979), 540-46; Haas, 'Die Musiklehre', 144.
[176] See for instance Lambertus (*Tractatus de musica*, fol. 12vb) who defines the modes as 'regula quedam qua cantus regitur, discernitur et moderatur'.
[177] W. Frobenius, 'Modus (Rhythmuslehre)', in *HMT*, 4 (1975).
[178] Anonymous of St. Emmeram, *De musica mensurata*, 186.

notably Johannes de Garlandia developed the notion of *modus* with the metrical tradition or chant theory in mind rather than modal logic or speculative grammar, two domains with which they were probably little conversant.

Tempus is another crucial notion of *musica mensurabilis* which is problematic. Dorit Tanay recently argued that Franco of Cologne's notational innovations have to be related to his incorporation of a new concept of *tempus* that he elaborated from Aristotle's ontological definition of time in *Physics* IV, 10-14, a passage which gave rise from *c.*1240 to numerous heated discussions in the Parisian University. While previous music theorists define *tempus* in relation with metrics, she asserts, Franco's musical time is marked by the seal of Aristotelianism, thus opening up a new conceptual space for *musica mensurabilis*.[179] Is Franco of Cologne's definition of time truly influenced by Aristotelian philosophy?

It is true that following the metrical tradition, Johannes de Garlandia posits *tempus* as an indivisible unit measuring a duration equivalent to the breve.[180] Musical time comes into being when vocal sound is uttered correctly (*vox recta*), when it is broken (*vox cassa*), or omitted (*vox amissa*) as in rests.[181] The Anonymous of St. Emmeram follows closely this definition that he transforms only to accommodate the semibreve which enters in contradiction with the principle of the indivisibility of the breve set forth by Johannes de Garlandia.[182] Franco, by contrast, proposes a seemingly new definition of *tempus*. Musical time is redefined as the measure of vocal sounds and of their contrary, rests.[183] Looking for the sources of such a definition is difficult due to Franco's idiosyncratic conciseness. The obvious innovation here is the introduction of the notion of *mensura* in the definition. Because Aristotle himself describes time as the 'measure of motion and rest',[184] it is easy to

[179] Tanay, *Noting Music*, 19-38.
[180] 'Unum solum tempus, prout hic sumitur, est illud, in quo recta brevis habet fieri in tali tempore, quod fit indivisibile.' (Johannes de Garlandia, *De mensurabili musica*, 37-38).
[181] Ibid.
[182] See Lambertus, *Tractatus de Musica*, fol. 30va; Anonymous of St. Emmeram, *De musica mensurata*, 102.
[183] 'Tempus est mensura tam vocis prolatae quam eius contrarii, scilicet vocis amissae, quae pausa communiter appellatur.' (Franco of Cologne, *Ars cantus mensurabilis*, 25).
[184] Aristotle, *Physica*, IV, 12 (221b22).

see Franco's description of *tempus* as wholly Aristotelian.[185] Indeed vocal sound is after all a kind of motion.[186]

Yet, it should be noted that in his *De musica* Augustine had already equated *tempus* and *mensura*.[187] That Franco perhaps knew Augustine's treatise can be inferred from another definition of time given in his *Ars cantus mensurabilis*. Equating the breve to one *tempus*, Franco affirms: 'Unum tempus appellatur illud quod est minimum in plenitudine vocis'.[188] Such a phenomenological definition of time explicitly posits a *tempus* as a minimal duration during which an uttered vocal sound reaches its plenitude. Such definition bears striking resemblance with a passage from Augustine's *De musica* where the Bishop of Hippo likewise defines a *tempus* as 'quasi minimum spatii quod brevis obtinet syllaba'.[189] A Parisian manuscript of Augustine's treatise, F-Pn lat. 16662, contains on fol. 28v a gloss next to this passage which suggestively reads: 'nota pro musica mensurabili.' This manuscript was owned by Peter of Limoges before being bequeathed to the Sorbonne in the early fourteenth century. As we have already seen Peter also owned and annotated a copy of Hieronymus' de Moravia's *Tractatus de musica* (F-Pn lat. 16663) which transmitted Franco's treatise.[190] The glosses in F-Pn lat. 16662 are from a palaeographical point of view similar to Peter's annotations.[191] Thus knowing both Franco's treatise and Augustine, it is quite possible that, already in the early fourteenth century, Peter of Limoges saw the clear connections between the two authors' respective definitions of *tempus*. If Franco was inspired by Augustine's *De musica* for his definition of *tempus* as minimum, it is also quite

[185] Tanay, *Noting music*, 36.
[186] See Boethius, *De institutione musica*, I, 3, p. 189.
[187] Augustine, *De musica*, II, 3, 1101.
[188] Franco of Cologne, *Ars cantus mensurabilis*, 34. This definition is also quoted in the second version of Johannes de Garlandia's *De mensurabili musica*, 91.
[189] Augustine, *De musica*, II, 3, 1101.
[190] On Peter's annotations in Hieronymus' *Tractatus*, see C. Page, 'Jerome of Moravia on the Rubeba and Viella', *The Galpin Society Journal*, 32 (1979), 77-98.
[191] On the characteristic of Peter's hand see M. Mabille, 'Pierre de Limoges, copiste de manuscrits', *Scriptorium*, 24/1 (1970), 45-47.

possible that he found in the same passage from Augustine, and not in Aristotle's *Physics*, the source of his definition of *tempus* as *mensura*.

Turning back precisely to this definition, a fuller picture may be gained by looking at Franco's definition of measure, placed just before his explanation of time. *Mensura* is according to Franco, 'a ratio (*habitudo quantitativa*) revealing the length and shortness of any measured music'.[192] Because time is a *mensura*, it must be seen as a ratio measuring vocal sounds and rests. Franco is not innovative here, for one generation before him, Lambertus, glossing on Johannes de Garlandia's definition, had already posited time as a ratio equivalent to a breve.[193] Thus, as with many other central aspects of the *Ars cantus mensurabilis*, Franco seems to rely here on Lambertus. Therefore, to define musical time, Franco relied not only on the metrical tradition of Augustine's *De musica* which was instrumental for the codification of the theory of the rhythmic modes but also on a former tradition of music writing, two traditions with which he was no doubt acquainted. His great contribution was less the transposition of musical entities and concepts into the conceptual space of Aristotelianism than the clear and concise reformulation of Lambertus' definition of *tempus*. We are indeed far from the kind of Aristotelian revolution in the domain of *musica mensurabilis* alluded to by Tanay.

Moving from foundational concepts to the surface of the theoretical discourse on measured music, several modern scholars have noted the presence of terms and notions derived from Aristotelian logic and from grammar in the five music treatises under scrutiny here.[194] The number of these borrowings varies from one treatise to the next: almost none in Lambertus' treatise, a few in Johannes de Garlandia, Anonymous IV and Franco of Cologne's treatises, and a plethora in the Anonymous of St. Emmeram's *De musica mensurata*. In fact, the integration of logical and grammatical terminologies in the five

[192] Franco of Cologne, *Ars cantus mensurabilis*, 29.
[193] '[T]empus, ut hic sumitur, est quedam proportio justa in qua recta brevis habet fieri.' (*Tractatus de Musica*, fol. 30va; also quoted in Jacobus Leodiensis, *Speculum musicae*, VII, 11, pp. 26-27).
[194] See above, 273.

thirteenth-century Parisian *musica mensurabilis* treatises serve two main functions: a didactical function and a more 'cosmetic' function, to recall Christopher Page's expression.[195]

Sensible examples of a didactical use of grammar and Aristotelian logic occur when music theorists are intent on clarifying certain musical terms by drawing parallels with grammatical and logical notions with which the audience of the treatise is supposed to be familiar. For instance, in the first version of the *De mensurabili musica*, Johannes de Garlandia distinguishes among the six rhythmic modes three modes *recti* or *mensurabiles* (Modes 1, 2 and 6) and three modes *ultra mensurabiles* (Modes 3, 4 and 5). A mode *rectus* only contains breves equivalent to one *tempus* (*recta brevis*) and/or longs equivalent to two *tempora* (*recta longa*) whereas a mode *ultra mensurabilis* contains breves of two *tempora* and longs of three *tempora*, that is figures which are *ultra mensuram*.[196] This notion of being *ultra mensuram* may not have been well understood, for in the second version of Garlandia's treatise the term *obliquus* was substituted for *ultra mensuram* and its cognates. The opposition *rectus/obliquus* was generally used in medieval grammar to distinguish the cases that directly address the subject (nominative, vocative) from the others cases (accusative, genitive, dative, ablative) which concern it indirectly. In grammar, the *casus recti* are predominant over the *casus obliqui*, for the knowledge of what is indirectly addressed to a subject always presupposes knowledge of what is directly addressed to it.[197] Once applied to the modes, this idea captures perfectly the superiority of the *modi*

[195] C. Page, *Discarding Images. Reflections on Music and Culture in Medieval France* (Oxford, 1993), 122.
[196] Johannes de Garlandia, *De mensurabili musica*, 36-39.
[197] See also Petrus Hispanus, *Tractatus*, ed. L. M. De Rijk (Assen, 1972), I, 4, p. 2; *Logica Modernorum*, ed. L. M. De Rijk (Assen, 1961-1967), II/2, 293-4 and 311-12. According to the grammarian Johannes le Rus writing *c.*1250: 'Obliquum non cognoscitur nisi per rectum.' (*Summa de arte grammatica*, I-Rvat lat. 7678, fol. 89a; quoted in Haas, 'Die Musiklehre', 122).

mensurabiles over the *modi ultra mensurabiles* and hence reaffirms the predominance of the metrical tradition, with its two-*tempora* long, in Garlandian modal theory.[198]

Another good example of the didactical explanation of a point of doctrine with the help of grammar or logic is Franco of Cologne's description of ligatures. Franco grounds his re-articulation and rationalisation of the Garlandian theory of ligature[199] on three elementary and yet central notions of Aristotelian logical taxonomy: species, genus and differentia. According to Porphyry's *Isagoge*, a short tract on the Aristotelian theory of predicables which opened the medieval curriculum in logic, the addition of differentiae to a genus divides it into several species.[200] For Franco, five constitutive differentiae divide the genus of ligature into several species. Three of these differentiae (*cum proprietate*, *sine proprietate*, *cum opposita proprietate*) apply to the beginning of a ligature and two others (*cum perfectione* and *sine perfectione*) to the end.[201] The adjunction or removal of one of these five differentiae not only alters the shape of the ligature but also its rhythmic value.[202] To further describe the constitutive function of the differentia, Franco refers to an example used in the famous Porphirian tree and in many introductory logic tracts. A ligature *cum proprietate* differs from a ligature *sine proprietate* in the same way as a 'rational animal' is different from an 'irrational animal'; in both cases the added differentia ('*cum proprietate*', '*sine proprietate*', 'rational', 'irrational') divides the genus ('ligature' or 'animal') into two

[198] The definition of short and long syllables as respectively equal to one and two *tempora* was notably found in the two main grammar textbooks of the Middle Ages: Priscian's *Institutiones grammaticae* (II, 12-13, pp. 51-2) and Donatus' *Ars maior* (I, 3, p. 607).

[199] F. Reckow, 'Proprietas und perfectio. Zur Geschichte des Rhythmus, seiner Aufzeichnung und Terminologie im 13. Jahrhundert', *AcM*, 39 (1967), 130-133.

[200] '[…] differentias divisiones genere fiunt in species et definitiones assignantur.' Porphyry, *Isagoge*, ed. L. Minio-Paluello, *AL* I/6-7 (Bruges-Paris, 1966), 15. See also Petrus Hispanus, *Tractatus*, II, 12-13, pp. 20-21; *Logica Modernorum*, II/2, 510; Lambertus of Auxerre, *Summa*, ed. F. Alessio, (Florence, 1971), 56-60. For a more detailed definition of the relations between *genus*, *differentia* and species see also Aristotle, *Topics*, IV, 2 and 6, and VI, 6.

[201] Franco of Cologne, *Ars Cantus mensurabilis*, 44. On the notions of *proprietas* and *perfectio* in the thirteenth-century ligature theories see Reckow, 'Proprietas', *passim*.

[202] 'sicut per has differentias ligatura una differt ab alia formaliter, ita et in valore […].' (Franco of Cologne, *Ars cantus mensurabilis*, 50).

distinct species.[203] This didactical use of the Aristotelian theory of predicables would have allowed anyone conversant with elementary logic to comprehend Franco's theory of ligatures. Joined with musical examples for each species of ligature, Franco's constituted the best pedagogical explanation of this difficult part of mensural notation, an exposé whose resonance was to last until the beginning of the fifteenth when the Paduan polymath Prosdocimus de Beldemandis would disregard the Franconian ligature terminology as obsolete.[204]

On another occasion, Franco reaffirms his will to emancipate the individual notes (*figurae*) from the rigid framework of the rhythmic modes with the help of Aristotelian logic. Johannes de Garlandia posits *figura* as a 'representation of sound in accordance with its mode'.[205] For Franco this is tantamount to affirming that the note-values are determined by the mode pattern, whereas, as he shows, it is the note-values which determine the mode pattern.[206] To make this point clear Franco describes the *figura* as a 'sign' (*signum*) of the mode.[207] To further clarify his position, Franco draws an interesting parallel: 'Cum autem istorum modorum voces sint causa et principium et earum notae sint nota, manifestum est quod de notis uel figuris, quod idem est, est tractandum.'[208] Since vocal sounds are the cause and principle of the modes, the notes standing for these (*notae*, a synonym for *figurae*) are their 'marks' (*nota*). Anyone acquainted with Aristotelian logic would instantly have had in mind the beginning of Aristotle's *De interpretatione* in the translation by Boethius where spoken sounds are described as 'marks' (*notae*) of the affections in the soul which are themselves likenesses of actual things.[209] By positing the notes as 'marks' or 'signs' of the

[203] Franco of Cologne, *Ars cantus mensurabilis*, 44. For the example of the rational and irrational animals see Porphyry, *Isagoge*, 16; Petrus Hispanus, *Tractatus*, II, 13, p. 21; Lambert of Auxerre, *Summa*, 60.
[204] Reckow, 'Proprietas', 143.
[205] Johannes de Garlandia, *De mensurabili musica*, 44; see also Lambertus, *Tractatus de musica*, fol. 19vb.
[206] 'Figura est repraesentatio vocis in aliquo modorum ordinatae, per quod patet quod figurae significare debent modos, et non e converso […].' (Franco of Cologne, *Ars cantus mensurabilis*, 29).
[207] Ibid., 26.
[208] Ibid., 28.
[209] Aristotle, *De interpretatione*, 1 (16a4-9), *translatio Boethii*, ed. G. Verbeke, *AL* II/1-2 (Bruges-Paris, 1965), 5.

modes, Franco clearly underscored the prominent semiotic function of note-shapes in the determination and identification of the rhythmic modes.

A final example of recourse to logic to explicate a point of musical theory can be found in the Anonymous of St. Emmeram. After Johannes de Garlandia, the semiotic system of measured notation counted three note-shapes: long, breve and semibreve. Two note-values corresponded to each one of these note-shapes. Contextual rules of syntactic combination determined which value was to be preferred. For instance, depending upon the context, a *figura brevis* could either represent a *recta brevis* of one *tempus* or a *brevis altera* of two *tempora*. To explain this semiotic ambiguity, the Anonymous of St. Emmeram introduced the central logical notion of 'equivocation' (*aequivocatio*). According to him the three simple *figurae* of measured music are formally differentiated but, from the point of view of the signification, they are equivocal.[210] A description of equivocal names (i.e. names which refer to several things at the same time) featured in the opening lines of Aristotle's *Categories* and the multiple processes of 'equivocation' in propositions were explored in detail in thirteenth-century logical handbooks.[211] By drawing a parallel between rhythmic signification and linguistic equivocation, the Anonymous of St. Emmeram captured perfectly the ambiguous nature of musical signs and the crucial role played by the context in establishing their value. In the fourteenth century, Jacobus Leodiensis would also refer to the notion of *aequivocatio* in a similar way to discredit the idea that a perfect long can transform into an imperfect long.[212]

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[210] '[S]ex esse figuras simplices […] quia sub forma triplici variantur, ideo tres simplices esse dicimus, quas etiam propter significationem aequivocas appellamus.' (Anonymous of St. Emmeram, *De musica mensurata*, 98).

[211] Aristotle, *Categoriae*, 1 (1a1-3), *translatio Boethii*, ed. L. Minio-Paluello, *AL* I/1-5 (Bruges-Paris, 1961), 5. See also Petrus Hispanus, *Tractatus*, II, 20, p. 25; Lambert of Auxerre, *Summa*, 72; *Logica modernorum*, II/2, 337, 559 and 648. Equivocation was also the first kind of fallacy *in dictione* analysed in Aristotle's *Sophistical Refutations*.

[212] Jacobus Leodiensis, *Speculum musicae*, VII, 42, pp. 82-83. It is noteworthy that Jacobus quotes a school-example of *dictio equivoca* ('canis' which signifies 'animal latrabilis', 'sidus coelestis' and 'piscus marinus') which is notably found in Petrus Hispanus' *Tractatus* (II, 20**,** p. 25).

More 'cosmetic' or decorative uses of logical and grammatical notions are also apparent in the thirteenth-century Parisian *musica mensurabilis* treatises. In this case the intent is not to clarify points of notation but to derive legitimacy from grammar and logic concerning the ordering of the matter in the treatise or certain terminological choices.[213] Franco's *Ars cantus mensurabilis* provides a good example of an *ad hoc* justification of the chapter-order of the treatise. Following the Garlandian model, Franco affirms that note-shapes which represent vocal sounds must be treated before rests which signify the omission of vocal sound because possession (*habitus*) always comes before privation (*privatio*).[214] That *habitus* always precedes privation is an Aristotelian truism that Franco could have borrowed from the tenth chapter of the *Categories* or from any elementary textbook on logic.[215] Thus, Franco legitimised a widely accepted and conventional order of exposition by decking it out in a more Aristotelian garb.

Similarly, the Anonymous of St. Emmeram justifies the fact that the use of the *plica* in ligature must be treated only after a complete exposé of the ligatures because the *plica* 'habet esse tanquam accidens in subiecto' and 'prius sit agendum de essentiali quam de suo accidente'.[216] Behind this affirmation lies the Aristotelian distinction, found in Aristotle's *Topics* and in Porphyry's *Isagoge*, between an accident which needs the subject to exist and a subject which retains its essential properties even when deprived of its accident.[217] Because the *plica* as a melodic inflexion is an accident which does not alter the essential characteristics of a ligature, that is its the shape and rhythmic value, it must indeed be dealt with at a later stage.

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[213] Franco of Cologne, *Ars cantus mensurabilis*, 25.
[214] 'Sed cum prius sit vox recta quam amissa, quoniam habitus praecedit privationem, prius dicendum est de figuris, quae vocem rectam significant, quam de pausis quae amissam' (Franco of Cologne, *Ars cantus mensurabilis*, 29).
[215] 'Sed ex habitu in privationem fit mutatio, a privatione vero in habitum impossibile est.' (Aristotle, *Categoriae*, 35 [13a33]). See also Petrus Hispanus, *Tractatus*, III, 29, pp. 39-40.
[216] Anonymous of St. Emmeram, *De musica mensurata*, 154. See also Yudkin, 'The Influence', 184.
[217] Porphyry, *Isagoge*, 20; Aristotle, *Topics*, I, 5 (102b4-14).

On other occasions, the Anonymous of St. Emmeram uses the expression *esse*/*bene esse*, ubiquitous in texts from the Arts faculty of Paris,[218] to validate the structure of his argument. For the anonymous author it is normal that the discussion of the equivalence and combination of the rhythmic modes is treated before the description of the *hoquetus* which relies precisely on rhythmic equivalence between different parts. The former belongs to the 'being' (*esse*) of the modes whereas the latter is less important and belongs to their 'well-being' (*bene esse*).[219]

The integration of purely decorative logical digressions is not limited to the justification of chapter-order. At times, Franco and the Anonymous of St. Emmeram turn to Aristotelian logic to validate or invalidate the use of certain technical musical terms. For instance, Franco justifies the denomination traditionally adopted for the ligatures (e.g. *cum proprietate et perfectione*, *sine proprietate et cum perfectione*, etc.) by referring to the Aristotelian idea that the definition of a species must comprise the genus under which this species is subsumed and its constitutive differentiae but that it does not necessitate the imposition of a new name. This is why, according to Franco, mentioning that a ligature is *cum proprietate* or *sine proprietate* is sufficient to define it. Thus, coining new names for each species of ligature was not necessary.[220]

Another example of such decorative use of logic is the Anonymous of St. Emmeram's invalidation of Lambertus' affirmation of the primacy of the long of three *tempora* over the two-*tempora recta longa* of the Garlandian tradition. Using commonplace number symbolism, Lambertus had elaborated a long digression showing the perfection of

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[218] The author of the *Compendium of Barcelona*, for instance, distinguishes the books of the Aristotelian *organon* which deal with the *esse logice* from those which deal with the *bene esse logice*.

[219] Anonymous of St. Emmeram, *De musica mensurata*, 224; and also 160, 232 and 244. On another occasion (Ibid., 116) the anonymous author uses the expression *per se*/*secundum quid* which conveys the same idea as the opposition *esse*/*bene esse*.

[220] 'Species quoque consistunt sub genere; ipsis tamen speciebus non est nomen impositum, sed eas dictae differentiae et suum genus circumloquuntur, secundum etiam quod in generibus aliis realibus invenitur, ut corpus animatum quod circumloquitur quamdam speciem, cui nomen non est impositum.' (Franco of Cologne, *Ars cantus mensurabilis*, 44-45). The exemple of the *corpus animatus* derives from Porphyry, *Isagoge*, 9. See also Aristotle, *Topics*, I, 8 (103b14-17); Petrus Hispanus, *Tractatus*, II, 8, p. 19.

the number three and its obvious theological association with the Trinity.[221] He could then rename the three-*tempora ultra mensuram* long '*longa perfecta*', and the two-*tempora recta* long '*longa imperfecta*'.[222] Such terminology, which set a precedent for Franco of Cologne, departed greatly from the Garlandian tradition. As a defender of this tradition, the Anonymous of St. Emmeram rejected the appellations *longa imperfecta* and *longa perfecta* and hence the primacy of the three-*tempora* long advocated by Lambertus. To do so, he refers to the common Aristotelian principle according to which the degree of perfection or completeness of a thing is determined by its form.[223] Because the two-*tempora* and three-*tempora* longs are both represented by the same note-shape, none can be said 'imperfect' for they both retain the perfection, that is the completeness of their form.[224]

In fact, for the Anonymous of St. Emmeram, the adjectives 'minor' and 'major' are more appropriate to describe the two- and three-*tempora* longs. Once again the anonymous author follows an Aristotelian idea according to which degrees of magnitude can be applied to things of the same *genus* that are more or less different. The adjectives 'major' and 'minor' can therefore be joined to different notes having the same form but different values: for instance, a three-*tempora* long and a two-*tempora* long or a *brevis altera* and a *recta brevis*.[225] Thus, with the help of Aristotelian logic not only did the Anonymous of St. Emmeram invalidate Lambertus' three-*tempora longa perfecta* but he also authenticated the use of the opposition minor/major, an opposition that was not threatening the metrical foundation of Garlandian modal theory. It is noteworthy that the problem of degrees implied by the use of the terms 'more' and 'less' helped approach from a logical point of view

[221] Lambertus , *Tractatus de musica*, fol. 21va. For the sources of Lambertus see Haas, 'Die Musiklehre', 143.
[222] Lambertus, *Tractatus de musica*, fol. 21va.
[223] See notably Petrus Hispanus, *Tractatus*, II, 15, p. 28. See also Aristotle, *Metaphysics*, V, 16 (1021b21-22) and *Physics*, II, 2 (194a27-28); *Auctoritates Aristotelis*, 2, 61.
[224] 'Cum autem minor longa et maior in forma protractionis conveniant aliquo non obstante, licet in quantitate differant potestatis, nulla earum de iure dici poterit imperfecta, cum perfectionis formam retineant et importent.' (Anonymous of St. Emmeram , *De musica mensurata*, 104).
[225] '[M]inoritas et maioritas assignantur inter res eiusdem generis secundum magis et minus differentes. Voces in musica, quae indifferenter se habent quoad formam, sunt huiusmodi, quare sic denominari nec inmerito meruerunt.' (Anonymous of St. Emmeram, *De musica mensurata*, 102). See also Porphyry, *Isagoge*, 16 and 29; Petrus Hispanus, *Tractatus*, III, 26, p. 38; *Logica Modernorum*, II/2, 547.

difficult problems of ontology and natural philosophy and was frequently discussed in the form of *sophismata* at the Arts faculty of Paris in the thirteenth century.[226] Perhaps the Anonymous of St. Emmeram was acquainted with these discussions.

At the end of this survey, it seems that the philosophical import in the five most important treatises on *musica mensurabilis* is extremely limited. Direct or more diffuse references to the 'new Aristotle' and more precisely to the *libri naturales* are virtually absent. The conceptual space opened with the gradual reception of Aristotelian natural philosophy which culminated in the Arts faculty of Paris in the second half of the thirteenth century did not provided the matrix for the theorisation of *musica mensurabilis*. Rather, the metrical tradition and chant theory provided the conceptual framework for the elaboration of the theory of the rhythmic modes and of the subsequent notational innovations introduced by Lambertus and Franco.

However, the five authors under scrutiny here were undeniably, even if to various extents, acquainted with the concepts and terminology of grammar and Aristotelian logic, and with the scholastic mode of writing. The presence of scholastic formulae in these treatises, ubiquitous in a vast array of writings even of the most elementary kind since the twelfth century, is not sufficient to describe the latter as direct emanations of the Arts faculty. Only the Anonymous of St. Emmeram manifests a real acquaintance with the method of textual analysis and argumentation of the Arts faculty of Paris. The borrowings from grammar and principally from Aristotelian logic are confined to a few elementary notions, except in the treatise by Anonymous of St. Emmeram which displays a broader range of logical concepts.

Yet, even in the latter treatise the logical import remains limited to basic Aristotelian notions (*genus*, *species*, *differentia*, *habitus*, *privatio*, *equivocatio*, etc.) mainly drawn from the *logica vetus*, that is, from Porphyry's *Isagoge*, Aristotle's *Categories* and his *De*

[226] See S. Ebbesen, 'The more, the Less. Natural Philosophy and Sophismata in the Thirteenth Century', in *La nouvelle physique du 14^e siècle*, eds. S. Caroti and P. Souffrin (Florence, 1997), 9-44.

interpretatione, texts which had been available for centuries in translations by Boethius and which had been intensively studied and commented on in Paris since the beginning of the twelfth century. In the thirteenth century, these notions could also be found in the opening parts of widespread logical handbooks such as Petrus Hispanus' *Tractatus*, Lambertus of Auxerre's *Summa* and the tracts published in the volumes of De Rijk's *Logica modernorum* which were used to teach elementary logic. We are indeed far from the typically scholastic subtleties of the debates on complex grammatical and logical issues that were taking place in the Arts faculty at that time.[227]

The five music theorists sometimes wove logical notions into their argumentation to justify *ad hoc* the chapter-order of their treatise or the use of a particular term to describe specific notational devices. Nevertheless, this does not imply that the logical or grammatical import in the Parisian *musica mensurabilis* treatises was only 'superficial' or 'decorative'.[228] It did serve another, more pedagogical, purpose. Logic provided useful parallels to explicate the functioning of the notational system. This didactical expedient was indeed, as we have seen, judiciously used by Franco and the Anonymous of St. Emmeram.

We cannot infer from such use of logic that the Parisian *musica mensurabilis* theorists were University masters. Some of them could well have gained their elementary knowledge of logic and grammar in other regular or secular educational institutions.[229] Others displaying a more varied usage of logical concepts (Franco and above all the Anonymous of St. Emmeram) probably frequented the Arts faculty for some time. Indeed, a great majority of the Parisian students only attended lectures for one or two years, receiving some training in logic and grammar only to renounce their academic ambitions, usually for

[227] For an overview of these debates see J. Pinborg, *Die Entwicklung der Sprachtheorie im Mittelalte*r, (Münster, 1967).
[228] Page, *Discarding*, 122.
[229] For recent research on the teaching of elementary logic in Paris outside the university see H. Braakhuis, 'Logica modernorum as a Discipline at the Faculty of Arts of Paris in the Thirteenth Century', in *EDFA*, 129-145. See also Gabriel, *Garlandia*, 111-112.

financial reasons.[230] Succeeding in a lucrative career as a professional musician or a notator certainly did not require university training. It is probably one such career as a musician that led Franco to the circles of certain magnates, perhaps even in the vicinity of the royal court, and to benefit from their patronage.

Similarly, the elementary nature of the logical and philosophical import in the thirteenth-century Parisian *musica mensurabilis* treatises clearly indicates that their main intended audiences were probably not students of the Arts faculty. This does not imply that Arts students could not indulge in the study of *musica mensurabilis* but rather that the latter discipline was not restricted to the lofty academic circles of the Parisian University. Anyone with a good knowledge of music (chant and probably also elementary non-measured polyphony) and with very little or even no familiarity with logic and philosophy could understand the essential content of the treatises. Even in cases where logical references played a didactic role (e.g. Franco's explanation of the ligatures), these were supplemented with duly chosen musical examples that made evident the content of the treatise to anyone not conversant with the jargon of Aristotelian logic. That the logical references in Franco's treatise were not essential to understand his doctrine is manifest when we turn to the numerous abbreviations of the *Ars cantus mensurabilis* produced at the end of the thirteenth and at the beginning of the fourteenth centuries. These texts generally avoid copying Franco's logical digressions.[231] Thus, inasmuch as the philosophical debates of the Arts faculty were not instrumental in the conceptualisation, elaboration and developments of the theory of measured music in the thirteenth century, the *musica mensurabilis* treatises for this period cannot be regarded as products of an informal teaching carried out by and for members of this institution.

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[230] See Chapter 1, 18-19.

[231] See for instance *Ars musicae mensurabilis secundum Franconem*, eds. G. Reaney and A. Gilles, *CSM* 15 (n.p., 1971), 38-54; *Compendium musicae mensurabilis*, ed. A. Gallo, *CSM* 15 (n.p., 1971), 66-72 [other versions ed. G. Reaney, *CSM* 34 (n.p., 1987), 27-36 and 49-58]; Johannes dictus Balloce, *Abbreviatio magistri Franconis*, ed. G. Reaney, *CSM* 34 (n.p., 1987), 13-21; Petrus Picardus, *Ars mottetorum compilata breviter*, ed. A. Gallo, *CSM* 15 (n.p., 1971), 16-24.

Before concluding this chapter, a few final remarks must be made about the subsequent developments of *musica mensurabilis* in the early fourteenth century that came to be known as *ars nova*.[232] As we have seen with the Anonymous OP and Johannes de Muris in Chapter 4, it would seem that members of the Arts faculty participated actively in the heated debates *c*.1320 about rhythmic notation, and more particularly about central notions, such as imperfection and alteration, characteristic of the *ars nova* theory. It was in relation to and in response to these debates that Johannes de Muris' composed his *Notitia artis musicae* in 1321. The *Notitia* is a momentous treatise not only because it codifies the notational advances of the *ars nova* but also because it provides the first example of a brilliant incorporation of the new Aristotle into the very conceptual fabric of the theoretical discourse on *musica mensurabilis*. It is true that Hieronymus de Moravia had attempted *c*.1300 to describe musical time with the help of the Aristotelian definition of time as the 'number of motion in respect of the before and after' given in the *Physics*[233] but Muris is the first music theorist to elaborate a treatise on rhythmic notation rooted in the system of nature brought about by the reception of Aristotelian natural philosophy.

The *Notitia* is saturated with Aristotelian references and with philosophical digressions: the proem and its references to the *Metaphysics*; the theory of sound and hearing influenced by the *De anima*, the conception of musical time as a continuum and a measure of motion derived from the *Physics*; the notion that the notes have a maximum and a minimum duration borrowed from the theory of the limits of sensory perception in the *De anima* and the *De sensu et sensato*; the idea that a note is a sign linked by convention (*ad placitum*) to a signification deriving from Aristotle's definition of sign in the *De interpretatione*; the definition of musical notes as the union of the physical and the

[232] For an overview of the innovations of the *ars nova* in relation with the former notational practices known as *ars antiqua* or *ars vetus* see Haas, 'Studien', 393-413; and A. Gallo, 'Die Notationslehre im 14. und 15. Jahrhundert', in *Die mittelalterliche Lehre*, 257-356.

[233] Hieronymus de Moravia, *Tractatus de musica*, 180-181; see also Aristotle, *Physics*, IV, 11 (219b1-2). For an analysis of this passage see C. Berktold, 'Die Aristotelische und die musikalische Zeit bei Hieronymus de Moravia', in *Mittelalterliche Musiktheorie in Zentraleuropa*, ed. W. Pass (Tutzing, 1998), 1-7.

mathematical recalling the debates on the *scientie medie*; and finally the analogy between the process of imperfection and the theory of the *modi significandi*.[234]

The rather laconic character of these references hinders any attempt to associate conclusively Johannes de Muris with a particular school of thought or dominant master active in the Arts faculty of Paris in the early fourteenth century.[235] Nonetheless, it is clear that Aristotelianism provided the conceptual mould in which Muris fashioned the theory of the *ars nova*. If most of the notational advances of the *ars nova* were elaborated in practice, the new Aristotle provided authoritative justifications legitimizing certain theoretical choices rather than others. In Muris' treatise Aristotelian philosophy therefore contributed to the shaping of notational doctrines which were subject to intense debates among contemporary *doctores musicae*. As we have seen, among these *doctores musicae* that Muris revered as his peers and to whom he dedicated his treatise were two prominent composers, former members of the Arts faculty, Philippe de Vitry and Denis Legrant. This elective group of musicians and theorists certainly counted other former or current members of the Arts faculty, conversant with Aristotelian natural philosophy but also with the craft of musical composition. *Musica mensurabilis* had reached the circles of the Arts faculty, and members of this institution, probably joined by other people from different intellectual horizons but sharing the same musical interests, formed a *collegium musicorum* that paved the way for several decades of notational explorations and sophistications.

Conclusion

[234] All these aspects have been explored by several modern scholars. See M. Haas, 'Musik zwischen Mathematik und Physik: Zur Bedeutung der Notation in den *Notitia artis musicae* des Johannes de Muris', in *Festschrift für Arno Volk*, ed. H. Oesch (Cologne, 1974), 31-46; Id., 'Studien', 384-402; F. Della Seta, '*Utrum musica*', 202-221; and Hentschel, *Sinnlichkeit*, 164-173 and 204-5.

[235] No indisputable links can be established between Johannes de Muris and William Ockham or Johannes Buridan (Della Seta), Johannes Jandun (Hentschel), the Oxford Mertonians (Tanay) or the new Physics of the fourteenth century (Haas).

There is little doubt that music and perhaps also polyphony were performed and cultivated during the recreations of the youthful population of the Arts faculty. Yet, prior to the early fifteenth century, when the reformist Chancellor Jean Gerson took the initiative to nominate two University music teachers to remedy the poor quality of singing during the liturgical celebrations of the institution, the University authorities never sought to oversee or encourage the practice and instruction of music. While during the fourteenth century they attempted to gain increasing control over the grammar schools,[236] they never disputed the hegemony of the music schools. Practical music including polyphony was simply not part of the University's educational agenda.

As an ecclesiastical institution, the University followed a codified liturgy with its specific masses, processions, academic festivals and ceremonies. In fact, most of this liturgy was left to the discretion of the national groupings of the Arts faculty. While there is evidence, from the second half of the fourteenth century onwards, that the nations hired professional singers and organists to perform the divine offices on solemn feasts, and most notably on days of celebration of their respective patron saints, nothing allows us to affirm that these celebrations included measured polyphony or provided incentives to encourage members to gain proficiency in the craft of polyphony.

In addition, as we have seen, the idea that the Parisian colleges which flourished in Paris between 1250 and 1350 provided the institutional setting for the instruction and practice of measured polyphony must be discarded. Firstly, only one preparatory college, the *Collège de l'Ave Maria*, provided instruction in music and this instruction was confined to chant and psalmody. Secondly, the collegial authorities imposed a strict monitoring of every aspect of the fellows' life inside and outside the college which prevented the 'gatherings of musicians' alluded to by modern music scholars. The trammels imposed on the fellows by the authorities also extended to recreational activities. Anything that could

[236] Gabriel, *Garlandia*, 117.

disturb the quiet and studious atmosphere of the college, including music, was banned from most collegial enclosures. Finally, musical life in Parisian colleges was confined to the regular celebration of the divine offices and memorial services in the chapel in accordance with the requirements established by their founders and benefactors. The fact that a musical competence was not required to enter most colleges and the fact that a large majority of them had only very limited personnel to celebrate the liturgy seems to exclude the possibility that these celebrations included measured polyphony. The only firm piece of evidence regarding the eventual performance of polyphony in a collegial chapel in Paris in the thirteenth and fourteenth centuries concerns the *Collège de Dormans-Beauvais*, a college which maintained a significant number of chaplains and chapel clerks.

Just as the role of the University in providing the institutional context for the practice of *musica mensurabilis* has been overrated, so its role in providing the intellectual context for the theorisation of *musica mensurabilis* has been likewise overestimated. Although the five main treatises on *musica mensurabilis* produced in Paris during the thirteenth century integrate scholastic method and terminological usages to various degrees, they cannot be regarded as the product of an 'informal teaching' on rhythmic notation that would have been carried out in the margins of the Arts faculty by and for elective members of this institution. Some of the music theorists behind these treatises, and most notably Franco and the Anonymous of St. Emmeram, frequented the Arts faculty for some time but their notational theories probably owed nothing to the philosophical debates of this institution on the 'new Aristotle'.

The Aristotelian import, which was almost non-existent in Johannes de Garlandia's *De mensurabili musica* and in Lambertus' *Tractatus de musica*, slightly more important in Anonymous IV and in Franco of Cologne's *Ars cantus mensurabilis*, and profuse in the Anonymous of St. Emmeram's *De musica mensurata*, was in fact confined to elementary notions of logic. These notions had been widely used in the Parisian schools since the

beginning of the twelfth century and could have been gleaned in any handbook for the discipline. They were woven into the fabric of the texts, sometimes for decorative purposes, sometimes with a more didactical intent, but knowing them was not essential to the comprehension of the notational doctrines expounded. It is only at the beginning of the fourteenth century that Johannes de Muris composed the first truly Aristotelian treatise on *musica mensurabilis*. Grounding the theoretical discourse on measured music in the conceptual space of Aristotelianism, he codified the notational innovations that were the products of intense discussions among an invisible *collegium musicorum* which counted within its ranks members of the Arts faculty. Johannes de Muris was an exemplary figure who embraced with the same enthusiasm both *musica* as a speculative discipline taught in the Arts faculty and the technicalities of musical *praxis*. With him and the other members of this *collegium musicorum*, the boundaries between the practical and speculative realms blurred.

As a final remark it should be said that the elementary nature of the philosophical import in the thirteenth century *musica mensurabilis* treatises does not entail that the latter were simply addressed to children and hence that the teaching of measured polyphony was part of preparatory education, as Max Haas thought. Before the fifteenth century, learning how to sing measured polyphony and performing it were, in general, not part of the duties assigned to the choristers of the many Parisian ecclesiastical institutions. Thus, learning and practising measured polyphony was neither limited to a particular intellectual milieu nor to a specific age group.

In fact, anyone proficient in chant theory and who had gone through the elementary stages of medieval education could be initiated into *musica mensurabilis*. Franco's *Ars cantus mensurabilis*, a treatise addressed to the general public and which had the clarity and conciseness of a primer, constituted a perfect handbook from which to learn the rudiments of measured notation. Numerous free-lance music teachers who were also notators and

performers, such as Jehan Vaillant, Jehan de Launay, Johannes Carmen and perhaps, in the thirteenth century, Franco of Cologne himself, provided instruction in *musica mensurabilis* for the ecclesiastical institutions and the *universitas clericorum*, not in the narrow sense of 'University' but rather in the broader sense of 'congregation', of the French capital.

CONCLUSION

What was the role of music in the curriculum of the arts faculty of Paris at the end of the Middle Ages? This was the question asked at the outset of this study and from which two major claims were demonstrated. Firstly, it was shown that music as a quadrivial and speculative discipline was continuously taught in the Arts faculty of Paris in the late Middle Ages. This teaching was original and idiosyncratic because profoundly influenced by the dominant philosophical paradigm in the institution, namely Aristotelianism. Using a multiplicity of hitherto unpublished and unstudied sources emanating from the Arts faculty, the present study provided the first attempt to delimit the scope and nature of such a teaching. Secondly, this reconstruction eventually led us to affirm that, contrary to what had been affirmed by modern music scholars, the Parisian colleges and the University never encouraged or fostered musical practice and instruction and hence that the Arts faculty of Paris played at best an ancillary institutional and intellectual role in the emergence of measured polyphony.

The speculative discipline of music occupied a limited place in the Arts curriculum, which was overwhelmingly dominated by logic, grammar, and later, natural philosophy. Music was a secondary discipline taught on feast-days. Although the University year counted numerous feast-days, music lectures had to compete chiefly with moral philosophy and with the other disciplines of the *quadrivium* also taught on these particular days. This feast-day teaching of music was first made official in the Courson statutes of 1215 which probably sanctioned existing curricular practices. It became customary and was still implemented in the fifteenth century. Contrary to what was thought, the gradual integration of Aristotelian natural philosophy within the main curriculum of the Arts faculty of Paris, a process achieved by 1240 when the ban on the *libri naturales* was lifted, did not lead to an eclipse of music or of the *quadrivium*. Rather, there is indisputable evidence that *musica*

was continuously taught at the Arts faculty of Paris in the thirteenth and fourteenth centuries.

While logic and grammar constituted the two main disciplines studied for the *determinatio*, the first examination taken by Arts students, the study of *musica* and of the other feast-day disciplines complemented the study of natural philosophy for the licence examination. Such academic progression from grammar and logic to the three speculative branches of knowledge (natural philosophy, *mathematica* or *quadrivium*, metaphysics) and finally to moral philosophy, was the one devised by Aristotle himself. The Arts faculty attempted to institutionalise and put into practice the Aristotelian educational program. The ultimate aim of such a programme was the Aristotelian ideal of theoretical life, the supreme form of mental felicity proper to the philosopher. It is precisely in the thirteenth century that the masters of the Arts faculty began to claim their status as philosophers and to embrace the Aristotelian theoretical life as their ideal. This may explain why music and mathematics were still maintained in an institution where logic and natural philosophy were clearly the main concerns. Such an orientation also justifies the exclusion and depreciation of any practical disciplines, including music, from the academic horizon of the Arts faculty.

In practice, it is difficult to say if the ideal Aristotelian curriculum was always rigorously followed. Yet the *de forma* prescriptions mentioned in several sources from the Arts faculty of Paris indicate that the teaching of feast-day disciplines including music was not only official but also had an obligatory nature. Nonetheless, it is possible that the students were not bound to study all the feast-day disciplines but could choose a few of them and ask for dispensations for the others. The *de forma* prescription also confirms that the teaching of music in the Arts faculty of Paris was conducted with the first two books of Boethius' *De institutione musica*. While the treatise had been the reference music textbook since Carolingian times, confining study to the first two books was an innovation of this

institution. This also implied a drastic change of orientation in the way the treatise was envisioned

Compilations of excerpts, abbreviations and glosses produced by the Arts faculty imply a definitive departure from the previous hermeneutical tradition, a departure which owed much to the change in philosophical paradigm that came about with the suffusion of Greek Arabic Peripatetism. Prior to the thirteenth century, Boethius' *De institutione musica* had been envisioned as a repository of arithmetical exercises or as a tool used to understand the numerical harmony constitutive of the Creation. In the Arts faculty, lectures on the first two books of the treatise excluded arithmetical digressions and demonstrations and focused rather on definitions linked to the notion of consonance and on philosophical *topoi* such as the ones found in the proem of the treatise. Thus, the treatise was almost entirely purged of its arithmetical content and the emphasis was directed toward those aspects that could help provide an epistemological definition of *musica* as a *scientia media*, partly physical and partly mathematical and also a description of its subject matter, namely consonance. This is apparent in the Harley compilation, in the *Abbreviatio in musicam Boethii*, and in two anonymous sets of glosses on the treatise, that is to say, GB-Obac 317 (B_2) and, above all, GB-Occ 118 (C).

In fact, the latter set of glosses best represents what lectures on Boethius' treatise at the Arts faculty of Paris would have consisted of. The C glossator proposed a truly Aristotelian reading of the treatise. He commentated on certain passages of the treatise with the help of Aristotle's works and his very influential Arabic commentator Averroes. In addition, the C glossator discarded all the views expounded by Boethius that were in contradiction with the precepts of Aristotelian philosophy. Affirming the supreme authority of Aristotle, he invalidated Boethius' Platonic Pythagorean conception of an all-encompassing *musica* and more particularly the notions of *musica mundana* and *musica humana*. The scope of *musica* was therefore narrowed down to the study of consonance.

With the help of the Aristotelian notion of mixture, the C glossator redefined consonance as a blend of two sounds reducible to a determined ratio or as an ontologically ambivalent object whose matter is sound and whose form is number. Such an empirical conception of consonance led to a rehabilitation of sensory perception and sound as essential factors in the understanding of musical phenomena, and to a redefinition of *musica*, in accordance with the Aristotelian epistemological model, as a *scientia media* partly mathematical and partly physical.

The focus on problems directly linked to the epistemological definition of music and to the description, in Aristotelian terms, of its subject matter is also apparent in such introductory tracts from the Arts faculty as the basic handbooks and the examination compendia (*Compendium of Barcelona* or *De communibus artium*). The former provided minimal accounts of the discipline containing the elementary Boethian notions that the students were required to know, and the latter enunciated the simple problems that they were usually asked to solve during the licence examination.

The C glossator displays not only a broad and indeed impressive knowledge of Aristotelian philosophy but also an astute knowledge of Boethius' treatise. In contrast any familiarity with the *De institutione musica* in the handbooks and the examination compendia amounts at best to a few definitions, but knowledge of Aristotelian logic and philosophy was prerequisite. In a way, the anonymous set of glosses preserved in C and the introductory tracts represent both ends of the spectrum of competence in *musica* at the Arts faculty of Paris. On the one hand, the glosses can be seen as an echo of first-rate lectures on the first two books of the *De institutione musica*, while on the other hand the basic handbooks and examination compendia are representative of the kind of minimal knowledge about *musica* the arts students were expected to have.

It is not coincidental that the teaching of *musica* in the Arts faculty consisted of definitional and epistemological matters, reading Boethius through the lens of Aristotelian

philosophy, and attempting to delimit the place allotted to music in the general partition of knowledge. Indeed, no other references to music in the whole Aristotelian corpus captured the intellectual curiosity of the Parisian masters and generated controversies in the way that the short remarks from the *Physics* and the *Posterior analytics* about the epistemological characteristics of *musica*. The Parisian masters commentated on these passages using music as a model-discipline that would allow them to tackle the problems of the subalternation of sciences and the *scientie medie*. For that matter, having followed lectures on Boethius' *De institutione musica* in the Arts faculty certainly helped them formulate more in-depth arguments such as the ones found in early fourteenth-century commentaries on the *Physics* analysed in the present study. Thus, music teaching at the Arts faculty of Paris had in part an 'hermeneutical function'. It was devised to provide the students with the necessary conceptual and terminological background to enable them to grasp and comment on the musical references in the *Physics* and the *Posterior Analytics*.

The discussions on music at the Arts faculty of Paris in the commentaries on Aristotle, in the sets of *Questiones mathematicales*, in the examination compendia, in the basic handbooks or in the glosses on the *De institutione musica*, helped forge a new model for *musica* based on a philosophical muddle mingling Boethian and Aristotelian elements. Music was redefined as a *scientia media*, subordinated to arithmetic but also linked to natural philosophy. It now dealt with a newly constructed ambivalent subject matter determined formally by number and materially by sound. This model constructed through the teaching of music at the arts faculty of Paris was embraced not only by prominent music theorists such as Jacobus Leodiensis, Johannes de Muris, Johannes Grocheio and Henricus Helene who all certainly frequented the schools of the *Rue du Fouarre* at some point, but it would also remain influential for the centuries to come.

If this orientation of music teaching as a speculative discipline predominated in the Arts faculty of Paris, there are isolated cases of masters who engaged in more idiosyncratic

hermeneutical endeavours offering different approaches to Boethius' treatise and hence to music teaching. Although they do not seem to be the product of classroom lectures, the glosses on Boethius' *De institutione musica* written *c*.1220 either in Paris or in Oxford and now ascribed to Robert Grosseteste represent a good example of a very original reading of the treatise. Robert Grosseteste developed a Euclidian interpretation of the treatise by geometrising music theory problems and by systematically linking Boethian axioms to Euclidian theorems. Commenting on the more philosophical passages of the *De institutione musica*, he also developed numerous idiosyncratic theories which intertwined Augustinian, Aristotelian, Pythagorean and Neoplatonic motives into a syncretic synthesis. Such a heterodox and eclectic approach to the text constituted a learned attempt to conciliate the Pythagorean Platonic views of Boethius on central aspects of *musica* with those of Aristotle and his Arabic commentators.

It is probably because the teaching of music at the Arts faculty of Paris did not satisfy Johannes de Muris that in his *Musica speculativa* (1323-5) he attempted to reintegrate a more arithmetical dimension into this teaching. The *Musica speculativa* proposed an innovative approach to Boethius' *De institutione musica* and hence an alternative approach to the mainstream definitional conception of music teaching at the Arts faculty by combining Aristotelian epistemology with Pythagorean arithmetic, aspects of practical musical and Euclidian axiomatic method. Muris' treatise was the product of his lectures on Boethius' *De institutione musica* at the Arts faculty of Paris. Although it was probably used in the fourteenth and fifteenth centuries as a teaching guide for those masters wanting to go beyond the more traditional approach to music, it never officially became a text-book nor replaced Boethius' *De institutione musica* in the curriculum, as it did in the newly founded central European universities.

Finally, there is also evidence that in the fourteenth century certain Parisian Masters of arts participated in a broader range of discussions on music within the margins of the

official curriculum. Surviving scholastic questions about music indeed demonstrate that the study and teaching of music was neither confined to problems of classification and epistemology nor to the commentary of the textbook.

With the Parisian list of questions, it became apparent that the new languages of measure in fourteenth-century physics contaminated the realm of *musica*. *Musica* was now considered a *scientia media* that shared a community of problems with other sciences of the same epistemological status, such as optics and the science of weights. The introduction of these new problematics widened the scope of inquiry about music in the Arts faculty. They also modified traditional issues of Boethian music theory, and notably issues regarding consonances were envisioned, by putting an even greater emphasis on the physical nature of musical phenomena. Such focus on the physical nature of consonance and the crucial role of sense perception in its determination was also central in the first Erfurt question which tackled the *topos* of the *diapason cum diatessaron*.

It seems that, in the fourteenth century, Parisian masters gained more and more awareness of the changes that were occurring in the practical domain of measured polyphony. The anonymous author of the second Erfurt question attempted, for instance, to provide an epistemological definition of *musica mensurabilis* and to locate it in the Aristotelian classification of knowledge. Other masters or members as the Arts faculty, such as the Anonymous OP, Johannes de Muris, and the anonymous *doctores musicae* to whom the latter refers to in his *Notitia artis musicae*, even actively engaged in the heated discussions about new manners of notating and measuring musical time. Yet, the fact that the 'invisible college' of musicians, which discussed the technicalities of rhythmic notation, counted among its ranks current or former members of the Arts faculty, and notably such prominent composers as Philippe de Vitry or Denis Legrant, in no way implies that the institution was instrumental in the emergence and the developments of *musica mensurabilis*.

As has been shown in the present study, before the beginning of the fifteenth century University authorities never manifested any interest in instruction in practical music, be it chant or polyphony. A similar indifference was noticeable in the Parisian colleges which were previously thought to be centres for the cultivation of polyphony. Parisian Colleges and the nations of the University preferred to engage clerics to sing the divine offices and memorial services that punctuated the liturgical year. These celebrations probably did not even include measured polyphony. There was therefore no incentive for University authorities to encourage instruction in *musica mensurabilis*. The Arts faculty cannot therefore be considered as the missing institutional context for the developments of rhythmic notation in late medieval Paris.

This assertion is corroborated when we turn to the most important *musica mensurabilis* treatises written in Paris in the thirteenth century. As was demonstrated, the influence of the philosophical preoccupations of the Arts faculty in these works was not noticeable. In fact, the philosophical import of these treatises was indeed confined to elementary notions of Aristotelian logic employed either for purely decorative purposes or as illustrative parallels. Thus, the emergence of the theory of rhythmic modes and the subsequent emancipation from this constraining theoretical model as codified by Franco of Cologne owed nothing to Aristotelianism. If the new Aristotle was instrumental in providing a new model for *musica*, it played virtually no role in the theorisation of rhythmic notation and measured polyphony prior to the *ars nova*. It is only with Johannes de Muris' *Notitia artis musicae* that the theoretical discourse on measured music truly entered the conceptual space of Aristotelianism. Even in this case Aristotelian concepts do not seem to add anything essential to notational innovations elaborated independently in practice and appear more as *ad hoc* additions to justify certain theoretical choices.

Thus, instruction in music at the Arts faculty of Paris was confined to the speculative discipline of *musica*. Groups of masters and students could also nurture interests in the

practice of measured polyphony. For instance the master who compiled some of the parts of the manuscript P7378A combined interests in astronomy, optics, mechanics, speculative music and *musica mensurabilis*. The case of Johannes de Muris is also exemplary. He was a polymath able to digress on the more difficult mathematical aspects of speculative music theory, and at the same time a keen musician-philosopher fascinated by the measure and notation of musical time. Philippe de Vitry, Jacobus Leodiensis and Johannes de Grocheio are other members of the Arts faculty of Paris who devoted a part of their lives to the study and cultivation of music. But these are probably exceptional individuals, part of a *collegium musicorum* which encompassed people from a multiplicity of intellectual and social milieux.

The present study has helped gain clearer insight into the teaching of music in the Arts faculty of Paris. It has also been demonstrated that the University and the Colleges neither provided nor encouraged practical instruction in music and hence that, contrary to what was previously thought, they cannot be regarded as the missing institutional context for the momentous developments in the domain of *musica mensurabilis* which occurred in Paris in the thirteenth and early fourteenth centuries. It seems that teachers of polyphony operated on a freelance basis. Indeed in Paris there were music schools like that of Johannes Vaillant, Jehan Launay or even of Franco of Cologne, where members of the arts faculty and clerics from other intellectual backgrounds could gather to perfect their musical skills. In their schools anyone with a minimum of literacy, a good voice and enough money to pay his tuition fees learned how to compose, to perform and how to notate measured polyphony. Considering *musica mensurabilis* as a freelance activity opens a new avenue for further exploration, an exploration that will take as its point of departure the score of unpublished archival records from the Parisian ecclesiastical institutions and the extant Parisian musical repertoire.

Appendix A: The Liturgical Cycle in Medieval Parisian Colleges

Colleges	Date	Number of Scholars[1]	Chaplains[2]	Liturgy	Sources
Autun	1341-5/ (1317)	5A/5L/5T = 15	1	Daily: Mass (*sine nota*); Saturdays: *salve regina* with bells (at Compline); Solemn Feasts:[3] Mass, Hours and Vigils (*cum nota*); Yearly: two votive masses for the founder.	Sanderlin, *Medieval*, 38-62 and 69-97
Ave-Maria	1336/ (1336)	6G = 6	1	Daily: Hours of BMV, prayers to Saints, *Salve regina*, several orisons for founder; Fridays: Vespers of BMV (*cum nota*); Saturdays: Lady mass (*cum nota*), *Salve regina* (*cum nota*), *Concede* and *De profundis*; Sundays: Vigils of the Dead (*cum nota*) + 9 lessons, Mass (*cum nota*); Feast days: Mass and *Requiem* mass the next day (*cum nota*); Yearly:'O' antiphons at Vespers before Christmas and *Inviolata* procession with various stations in the City on the feasts of BMV and of Nativity (antiphon *inviolata*, oration *Deus qui de beata*, *De profundis*, *Inclina* and *Fidelium*); Procession to St Geneviève on Palm Sunday; Several pilgrimages to Parisian Churches during Easter.	Gabriel *Ave Maria*, 319-383
Bayeux	1308-15/ (1308)	A/2M/2L/T = 16	?	Weekly: mass in chapel; Yearly: mass for founder (in the Church of Saint-Severin)	F-Pan MM 346, fols. 1-4
Boissy	1366/ (1354)	3G/3A/3L/3T = 12	1	*Dies legibiles*: short mass (*sine nota*); Sundays and feast days: Mass + Hours and Requiem (*cum* or *sine nota*); Yearly: one mass for the founder (19 Jul. in the Church of Saint-André-des-arts)	Féret, *Faculté*, III, 611-632
Boncourt	1357/ (1353)	8A = 8	1	Daily: Hours of the BMV; Sundays: Mass and Vigils of the Dead for the founder (*alta voce*); Feast days: Mass	Félibien, *Histoire*, III, 440-444
Bourgogne	1331/ (1331)	20A = 20	1 also proctor	Daily: Mass (*cum* or *sine nota*) ; Sundays and feast days: Mass + Hours (*solemniter cum nota*); Saturdays: *Salve regina* (after Compline); Yearly: three masses for the founder (obit : 21 Jan., Monday after *Quasimodo*, Friday after St. Remigius)	Félibien, *Histoire*, V, 637-642
Cambrai	1348/ (1348)	7A = 7	1	Daily: Matins (*Veni creator*) and Vespers (antiphon BMV+R. *Domine non secundum* + antiphons St Martin, Patron of the Chapel); Weekly: minimum three masses; Sundays and feast days: Mass and Vespers (both *cum nota*); Yearly: one mass for the founder on the day after St Michael (*cum nota*).	Félibien, *Histoire*, III, 432-435
Cardinal Lemoine	1302/ (1302)	60A/40T = 100[4]	1T	?	Félibien, *Histoire*, V, 612-614
Chanac	1405/ (1348)	A/L/T = 6	1	Weekly: one *Requiem* mass for the founder; Sundays and feast days: Mass	Féret, *Faculté*, III, 600-611

[1] G= Grammar ; A = Arts ; M = Medicine ; L = Law ; T = Theology.

[2] An added letter means that one (or more) of the fellows in one of the four faculties (Arts, Medicine, Law or Theology) was officiating in the chapel.

[3] E.g. Nativity, Circumcision, Epiphany, Resurrection, Ascension, Five feasts of BMV, Pentecost, Corpus Christi, Holy Cross, St Michael, St John the Baptist, Apostles and Evangelists, St Augustine, St Jerome, St Ambrose, St Gregory All saints, St Clement, St Nicolas and St Catherine.

[4] This number was never reached. In 1302 the College had 4A and 2T and at the end of the 14t^{h} century 16A and 12T.

Cholets	1296-01/ (1296)	20T+20A	4T	Daily: two masses (*breviter et sine nota*); Sundays: Matins, Mass and Vigil of the Dead; Mondays: *Requiem* mass; Solemn Feasts (including St Cecilia, Invention of St Firmin and St Just): Vespers, Matins and Mass (*cum nota et solemniter*- with or without a sermon); Yearly: two masses for the founder (4 Aug. and 23 Nov.)	Félibien, *Histoire*, III, 301-303 and F-Pn 1220
Cornou-Ailles	1380/ (1321)	G/A/M/L/T = 10	1T or L	Weekly: Trinity mass (*sine nota*); Saturdays: Vespers, Compline, Lady mass, antiphon to BMV *ad usum Parisiensem* (all *alta voce et cum nota*); Sundays: Matins and Mass (*cum nota*), Vespers, Compline, Office of the Dead (9 psalms, 9 lections, 9 reponsories); Mondays: Lauds and *Requiem* mass (both *cum nota*); Solemn Feasts:[5] two Vespers, Compline, Matins and Mass (all *cum nota*)	Félibien, *Histoire*, III, 490-505
Dainville	1380/ (1380)	G/A/L = 12	1A ou L; also acts as proctor	Daily: mass for the founder, antiphon with versicle and oration to BMV (*devote cantare*), *De profundis* and *Fidelium*; Sundays: Office of the Dead (9 lessons, 9 orisons); Sundays and feast days: Vespers and Mass (*solemniter cum nota*), Matins (if *annuale* rank)	Félibien, *Histoire*, III, 507-513
Dix-Huit	1330/ (1180)	?	None	Yearly: three masses with Vigils and Prime for Founder (Day before Conversion of St Paul, Mondays after the Purification and the Assumption of BMV)	Coyecque, 'Collège', 176-186
Dormans-Beauv.	1370-2/ (1370)	G/A = 24	4 +2[6] clerks	Daily: Hours (*cum nota debite et succincte*), and after Compline antiphon, versicle and orison to the BMV; Sundays: Vigils of the Dead, Low mass *pro defunctis*; Mondays: *Requiem* mass (*cum nota*) ; Tuesdays: Low mass for St John Evangelist; Thursdays: Mass of the Holy Ghost (*cum nota*); Wednesdays and Fridays: Low mass *pro defunctis*; Saturdays: Lady mass (*cum nota*) ; Sundays and feast days: Hours and *magna missa* (*cum nota*).	F-Pan MM 356, fols.1r-4r and M 88, no. 23
Fortet	1396/ (1391)	A/L/T = 8	1T	Saturdays: Lady mass; Sundays: Mass (*secundum usum Parisiensem*); Wednesdays: Low mass *pro defunctis*; Feast days: in Notre-Dame Cathedral; Yearly: anniversary for the founder+ Vigils of the Dead.	Busquet, 'Etude', 142-149
Maître Gervais	1378/ (1370)	12A/2M /4T= 18	1 (*ad minus*)	Daily: mass (*sine nota*); Saturdays: Lady mass (*cum nota*); Mondays: *Requiem* (*sine nota*); Feast days: Vespers, Matins and Mass (all *cum nota*); Yearly : two masses for founder (*cum nota* – day after the Conception of the BMV and day after the Purification of the BMV)	Féret, *Faculté*, III, 632-662
Harcourt	1311/ (1280)	A28/12T= 40	1T + 1T clerk	Daily: mass (*sine nota*); Saturdays: Lady mass (*cum nota*); Feast days: Vespers, Matins and Mass (the latter *cum nota*); Yearly: two masses for the founder (Friday before Ash Wednesday and Friday before Exaltation of the Cross)	Du Boulay, *Historia*, IV, 152-162
Justice	1358/ (1358)	12A/M=12	1A or M	?	F-Pan M 137, no. 5
Laon	1327/ (1327)	16A = 16 (+2M/4T/1L in 1410)	1 + 3[7]	Daily: mass (*sine nota*); Sundays and feast days: Vespers and Mass; Solemn Feasts: Vespers, Matins and Mass (*cum nota*)	F-Pan MM 416, fols.1-6
Lombard	1333-92/ (1333)	A/T= 11	1 + 1 clerk	Daily: Mass (*sine nota*); Saturdays: Lady mass (*cum nota*); Sundays: Mass (*cum nota*); *Duplex* rank feasts: Vespers, Matins and Mass (all *cum nota*); Yearly: one mass for the founder (day after St Andrew)	Manno-Tolu, *Scolari*, 125-151
Mignon	(1343)	12A = 12	?[8]	?	F-Pan, J 152B, no. 22

[5] Nativity, Octave of Nativity, Epiphany, Easter, Ascension, Pentecost, Corpus Christi, five Feasts of the BMV, St John the Baptist, Common of the Apostles, St Nicholas, St Catherine, St Corentin, St Yvo, St Martin, Holy Cross, St Mary Magdalen, St Laurence the Martyr, Conversion of St Paul, St Peter's Chair, All Saints 'et omnibus aliis in quibus solent scholares de Pleasseo qui sunt pro maiori parte de natione Britanniae.'

[6] The four chaplaincies were instituted between 1380-1414 by relatives of the founder, the Cardinal Jean de Dormans.

[7] The Chapel was founded by Charles V in 1378 and consecrated by Foulques de Chanac in 1382. In 1390, the Bishop of Laon founded three more chaplaincies.

Montaigu	1402/ (1314)	L/T = 6	2L/T	Daily: one mass for the founder	Félibien, *Histoire*, V, 679-685
Narbonne	1371-9/ (1371)	A/M/L/T = 9	4A/M/L/T	Daily: one mass; Sundays and *duplex* rank feasts: two masses (*cum nota*); *Annuale* feasts : Mass, Vespers and Matins (*cum nota*); Yearly: one mass of Holy Ghost, one Lady mass and one *Requiem* mass for the founder (all *solemniter*)	Félibien, *Histoire*, V, 662, 675
Navarre	1305-15/ (1305)	20G/30A/20T = 70	(1305) 2 + 2 clerks (1315) 4 + 4 clerks	Daily: in 1305 one mass for founder (*cum nota*) – in 1315 one mass + Hours (*cum nota*); Sundays and Nine Lessons feasts: in 1305: one mass + Hours (*cum nota*) – in 1315: two masses + Hours (*cum nota*); Yearly: one mass for the founder	Du Boulay, *Historia*, IV, 74-96
Plessis	1326/ (1322)	20G/10A/L/T = 40	3	Daily: Mass + Hours (*cum brevi seu cursili nota* et *submissa voce*); Weekly: Mass for St Martin; Saturdays: Lady mass; Sundays: Vigils of the Dead (*solemniter*); Mondays: *Requiem* (*solemniter*); Feast days: two masses (*alta voce et cum cantu*) and Hours; Yearly: two masses for the founder and one votive mass for members of the French Royal family and the Papal Curia.[9]	Félibien, *Histoire*, III, 372-383
Presles	1324/ (1313)	A/L/T = 15	2	Saturdays and Sundays: Lady mass; Mondays: *Requiem* mass (*submissa voce*); Wednesdays: Mass of the Holy Ghost; Fridays: Mass of the Cross; Yearly: two masses for the founder (morning after St Vincent and Friday after *Quasimodo*).	F-Pan, M185, no. 11
St. Nic. du Louvre	*c*.1350 / (1225)	A= ?	1	'debet commissam divini offici et confratriam fideliter die et nocte exercere'	Du Boulay, *Historia*, IV, 139-141
Skara	1407/ (*c*.1300)	?	?	In case of the death of one scholar: three vigils, three penitential psalms and three masses.	Gabriel, *Skara*, 159-161
Sorbonne	1275-1319/ (1253)	25-30T	1T	Daily [a.1319]: Mass (*sine nota*); Saturdays [a.1307]: Lady mass (*Salve sancta parens, cum nota*); Feast days [a.1310]: Vigils and Mass (*cum nota*).	Glorieux, *Sorbonne*, 193-213
Tours	1333/ (1333)	A/M/L/T = 12 (6 Tours ; 6 Angers)	1T/L/A or *extra*	Daily: Mass (*sine cantu*); Feast days[10] and Sundays: Hours (*ad usum Turonesem*) and Mass (*alta voce et cum cantu*)	Félibien, *Histoire*, III, 408-411
Uppsala	1291/ (1278)	12A= 12	?	Daily: Hours of the BMV; Fridays and Saturdays: *Salve regina* (*cum nota*); Sundays and feast days: Vespers, Matins and Mass *ad usum Uppsalensem* (*cum nota*).	Liljegren, *Svenskt*, II, no. 1044-5

[8] We read in the Royal charter of foundation of the College that the latter should be provided with 'quadam capella pro divino servicio celebrando cum quodam calice, uno missali ac breviariis notatis'. (F-Pan, J 152B, no. 22).

[9] Most notably: King Philip IV and his sons, Queen Jeanne, King Charles IV, the Cardinal Cholet, Pope Clement V, Pope John XXII.

[10] The solemn feasts of the Parisian usage and celebrations indigenous to the diocese of Tours are notably St Maurice the Martyr, St Gratian, St Martin and the Translation of St Candid.

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