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**THE
RITUS CANENDI VETUSTISSIMUS
ET NOVUS
OF
JOHANNES LEGRENSIS**

**A CRITICAL EDITION WITH
TRANSLATION, INTRODUCTION AND
NOTES ON THE TEXT**

by

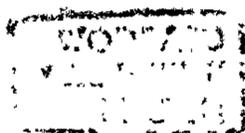
RICHARD VAUGHAN HUGHES

IN TWO VOLUMES

**SUBMITTED TO GLASGOW UNIVERSITY, THE FACULTY OF ARTS,
IN FULFILMENT OF THE REQUIREMENTS OF
THE DEGREE OF DOCTOR OF PHILOSOPHY**

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VOLUME ONE



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IN

ORIGINAL

THE RITUS CANENDI VETUSTISSIMUS ET NOVUS

OF JOHANNES LEGRENSE

A CRITICAL EDITION WITH TRANSLATION, INTRODUCTION AND

NOTES ON THE TEXT

by RICHARD VAUGHAN HUGHES

ABSTRACT

During the last forty years, many new editions of medieval and Renaissance music treatises have appeared; these replace the older editions, many of which are accommodated in the anthologies of Martin Gerbert and Edmond de Coussemaeker.

The aim of the present work is to provide for the reader a modern edition of *Ritus Canendi* from which Coussemaeker's frequent misreadings have been removed. The late Professor Albert Seay's own edition, published in 1980, also contains errors, many of which remain serious enough to mislead the reader, and it was on these grounds that a re-working of the Latin text was felt to be justified.

The work also contains a full English translation of the Latin text, in the belief that such treatises should enjoy as wide a readership as possible. The process of translation has involved the present editor in a study of such word usage as is relevant, and this in turn has provided an insight into Johannes' unnamed sources and influences.

The footnotes which are accommodated under the English text attempt to identify such source material, as well as provide specific references made by Johannes himself. Where a Greek source is identified, the reader is referred to the second volume of Andrew Barker's *Greek Musical Writings* for translations

into English. These sources are for the most part accommodated in my *Additional Sources and Observations*, as are comments from specific passages from *Ritus Canendi* when these have been translated by others.

The Introduction can be read without reference to the full text, since it contains ample quotations from the body of the treatise, with the original Latin accommodated in the footnotes in all cases.

Two main influences are identified in the Introduction:

1. The long tradition of the medieval speculative treatise is clearly represented. Here the emphasis is on Reason, and the close relationship between musical interval and mathematical ratio as portrayed in the legendary Pythagoras. If one is to view Johannes' work solely within this context, he is seen as a true conservative, for he mounts a strong attack against Marchetto da Padua's anti-Pythagorean views, and in particular his equal division of the whole tone and his ensuing chromaticisms. The views of modern commentators on Johannes' standpoint are also here discussed.

2. The Introduction also portrays Johannes as part of that spirit of enquiry which characterized Renaissance humanism, for he becomes the first to seek to interpret aspects of Greek music theory as described in the *De Musica* of the sixth century theorist and philosopher Boethius. Particularly significant here is Johannes' inspirational grasp of the basis of Boethius' modes; a summary of the medieval perception of these modes provides the context whereby incongruities in Johannes' text are identified, and the observations of recent writers commented upon.

The combination of Medieval and Renaissance influences within the treatise result in an interesting two way process: Johannes' interpretations of the Greek scalar systems are made in the light of the medieval experience, but it is his

preoccupations with these interpretations which lead him to overlook some of the classic features of medieval modal theory. The notion of *species* (the classification of which depends upon particular ways of filling in intervals according to tones and semitones) becomes the recurrent theme of the entire treatise, not only in theoretical, but in practical matters.

CONTENTS

VOLUME ONE

PREFACE	ix
INTRODUCTION	1
<i>Chapter One</i>	3
Johannes Legrense	
<i>Chapter Two</i>	13
Aspects of Greek Theory in Boethius' <i>De Musica</i> and in <i>Ritus Canendi</i>	13
Sound, Pitch and Interval	15
Intervals and Pythagorean Ratio	19
The Greek Perfect Systems	26
Greek Tonality and Boethian Modality	30
Johannes' Own Perception of Greek Theory	38
<i>Chapter Three</i>	
Medieval Modal Theory	47
The Octave Species Used to Explain 'Irregular' Chants	52
Aspects of Modal Theory in <i>Lucidarium</i>	55
<i>Chapter Four</i>	
Theory and Practice	63
The Monochord	63
The Solmization Process as an Aid to Singing at Sight	66
Simple Counterpoint	75
ADDITIONAL SOURCES AND OBSERVATIONS	83
BIBLIOGRAPHY	101

VOLUME TWO

THE TREATISE	115
Its Structure	117
The Manuscripts	118
Manuscript Characteristics and Relationships	120
Editorial Practice	123
ABBREVIATIONS USED IN THE APPARATUS CRITICUS	125
ABBREVIATIONS USED IN THE ENGLISH TEXT	126
THE TEXT AND TRANSLATION	129

PREFACE

The last forty years have witnessed what can be regarded as a Renaissance in the field of musical studies in that the old editions of medieval and Renaissance music treatises have begun to be viewed with more critical eyes. Gerbert's eighteenth century collection, and the nineteenth century Coussemaker anthology, are no longer regarded as definitive editions which make up a large corpus of musical literature, and which provide an invaluable insight into both theory and practice during the Middle Ages and beyond.

The aim of the present work is to provide for the reader a critical edition of Johannes Legrense's *Ritus Canendi* from which Coussemaker's frequent misreadings have been removed. A study of the late Professor Albert Seay's own edition of the treatise—published in 1980—has shown that this version too contains errors, many of which remain serious enough to mislead the reader, and it was on these grounds that a re-working of the Latin text was felt to be justified. Nevertheless, I am indebted to Professor Seay's work on the treatise, not least for his transcription of Johannes' word setting 'Ave mitis ave pia', and for his details of the contents of the manuscripts which accommodate the original text.

The present edition also contains a full translation of the text, in the belief that such treatises should enjoy as wide a readership as possible. The process of translation has involved the present editor in a study of such word-usage as is relevant, and this in turn has provided an insight into Johannes' unnamed sources and influences. The Notes which accompany the English text attempt to identify such source material, as well as provide specific references made by Johannes himself. Where a Greek source is identified, the reader is referred to the second volume of Andrew Barker's *Greek Musical Writings* for

translations into English. My *Additional Notes and Observations* towards the end of Volume One contain comments on specific passages from *Ritus Canendi* when these have been translated by others, together with further sources and fuller quotations.

This work is accommodated in two volumes: the first contains the Introduction, the Notes and the Bibliography, the second the full text and translation. The Introduction can be read without reference to the text itself, since it contains ample quotations from the body of the treatise, with the original Latin accommodated in the footnotes in all cases.

My thanks are due to Professor Patrick Walsh and Doctor Warwick Edwards, both of Glasgow University, for their infinite patience and wise counsel, to Elizabeth Rendall for typing the script, to Michael Whittles for scanning and re-formatting the text, and to my wife Glenys for her invaluable help with the proofreading: her advice on style and content has always been gratefully received. Here too I acknowledge the kind interest taken in this project by Professor Calvin Bower and Professor Dolores Pesce, and for their respective observations on the Boethius manuscript Vat. Lat. 5904, and Guido D'Arezzo's *Regulae rhythmicae*.

I would finally pay tribute to the late Mr Frederick Rowlands, sometime Senior Classics Master at Grove Park Grammar School for Boys, Wrexham. Without his scholarly teaching, the idea of embarking on this project could never even have been entertained.

INTRODUCTION

CHAPTER ONE

JOHANNES LEGRENSE

The year of Johannes' birth must remain a matter for conjecture, but since *Ritus Canendi*, according to Johannes' own testimony, was written during the papacy of Pius II (1458-62), we can conclude that he was born during the first half of the fifteenth century:

I do not mention these issues because of a wish to introduce new practice, but rather through a desire, under the Papacy of Pius II, to renew within God's Church the true, concise, and indeed easily mastered practices of the ancient fathers as regards sounds and pitches.¹

The school in Mantua which he later attended was founded by Vittorino da Feltre in 1423; it had earned for itself an international reputation, but such a reputation, strong enough to attract foreign students such as Johannes, would likely have taken at least a decade to become established. It is fair then to assume that it was as an adventurous young man of, say, twenty years that Johannes attended the school during the middle to late 1430's. This thesis suggests that Johannes was born sometime between 1415 and 1420.²

In his own Preface to *Ritus Canendi*, Johannes supplies some details of his early life: he says that he was 'born in Gaul',³ but towards the end of the first part of the treatise, he is more specific, and suggests that he spent his very early

¹*Ritus Canendi Pars prima* 1 Preface 6: 'Quae quidem non dico novam introducere volens, sed magis in Ecclesia Dei sub Domino Papa Pio Secundo renovare nitens veram antiquorum patrum atque brevem et facilem de sonis ac vocibus practicam'.

² Coussemaker sets the date at c.1415; see Edmond de Coussemaker, ed. *Scriptorum de musica medii aevi nova series* (Paris, 1864), volume 4 p. xii (hereafter CS). The view has not been challenged by more recent commentators: see Heinrich Hüsch, *Johannes Gallicus* in *Die Musik in Geschichte und Gegenwart* vol. 4, p. 1296-97. Also Albert Seay, ed. *Johannes Gallicus Ritus Canendi Pars Prima* (Colorado College, 1981), p. iii, and Cecil Adkins *Johannes Legrense* in *The New Grove Dictionary of Music and Musicians* (London, 1980), volume 10, p. 614 (hereafter *The New Grove Dictionary*).

³*Ritus Canendi Pars prima* 1 Preface 14: 'Gallia namque me genuit...'

years in Namur.⁴ Also in the Preface, Johannes says that Gaul made him into a singer,⁵ a positive statement which makes it very clear that he had undergone a course of instruction in singing, and his comment on Namur, that he had 'learnt of all these things in Namur from a very early age', suggests strongly that he had attended as a chorister in or near the town itself.⁶ Since it is clear that this same statement is made within the context of a brief discussion on measured music, and when one comes to consider the musical content of his polyphonic setting of a hymn from his own pen,⁷ he seems likely as a chorister to have been involved in the singing of polyphony; it is possible that he received some instruction in the handling of polyphonic techniques during these formative years.

Johannes' move to Mantua, already suggested as having taken place during the 1430's, means that we can associate him specifically with that invasion of Italy by musicians from the area which embraces the two great centres of Liège and Cambrai: the town of Namur lies almost in a direct line between the two, and is a mere thirty kilometres from the former. From Liège came the composers Arnold and Hugo Lantins, Johannes Brassart and Johannes de Ciconia, who was undisputedly the most important of the Netherland composers in the field of polyphonic music during the late fourteenth and early fifteenth centuries. All of these were to do service in the Italian courts during the first quarter of the fifteenth century, and must have undergone a thorough training in their own country before qualifying for such appointments abroad.

⁴*Ibid. Pars prima* 3.12.20: 'Haec omnia Namurci didiceram a cunabulis'. Namur is a town in modern Belgium, but during our period situated within the boundaries of the Spanish Netherlands; they in turn were accommodated within that larger area known as Gaul since Roman times. See also Note 3 above.

⁵*Ibid. Pars prima* 1 Preface 14: 'Gallia....fecit cantorem'.

⁶See note 4 above.

⁷*Ritus canendi Pars secunda* I.12.12-17 with musical example. Johannes claims authorship of both words and music; see *Ibid. Pars secunda* 1.12.8: '....ut est haec quam in verbis et notis excogitavi cantio devota, quamque multis in exemplum esse volui cantoribus'.

Dufay was a native of Cambrai who was also to serve, like his Liège colleagues, in several Italian courts. He stands at the centre of important musical innovations characterized by a synthesis of national styles which are identified by Tinctoris in the Introduction to his *Ars contrapuncti* (1477); he says that the only music worth listening to is 'that of the last forty years', and can be seen to regard the early 1430's. as the beginning of an Ars Nova.⁸ Such was the musical climate in Italy during Johannes' stay; this may well have moved him to speak of a universal musical language, for France and Italy are highlighted in his text as examples of national styles which come under the umbrella of such a universality: he readily criticizes those who would claim that there are 'many musics'⁹

That Johannes became a pupil of Vittorino da Feltre is clearly documented in *Ritus Canendi*:

However, after I had come to Italy, and carefully studied the *De Musica* of Boethius under that excellent teacher Vittorino da Feltre, I realized that I, whom I earlier regarded as a musician, had not yet attained the true practice of this art.¹⁰

There is no harm in assuming, as we did at the start of this Introduction, that Johannes was Vittorino's pupil specifically at his Mantuan school. It is clear from the quotation that the pupil held his teacher in the highest possible esteem, but this view reflects a reputation which was to earn for Vittorino, prior to his move to Mantua, the appointment to the Chair of Rhetoric at the University of Padua on the departure of Gasparrino Barzizza, who was regarded as the greatest Latin scholar of his day.

⁸Albert Seay, ed. *Johannis Tinctoris Opera Theoretica* vol. 2, p. 12 (Corpus Scriptorum de Musica (hereafter CSM) 22 (Rome 1975).

⁹*Ritus Canendi Pars prima* 1 Preface 15: 'Sileant igitur quicumque multas opinari solent esse musicas.....'

¹⁰*Ibid. Pars prima* 1 3.12.20: '.....sed cum ad Italiam venissem, ac sub optimo viro magistro Victorino Feltrensi musicam Boetii diligenter audissem, qui me prius musicum aestimabam, vidi necdum veram huius artis attigisse practicam'.

The university became the focus of attention as a centre of learning which embodied that spirit of humanistic enquiry which had its origins in the city during the second half of the thirteenth century. It was here that a small group of scholars came to take a keener interest in Latin poetry. Petrarch was later to outshine these early pre-humanists, as they came to be called, and it was his outstanding ability as a Latin scholar and writer that was to provide the inspiration for the flowering of humanism during the next century. From the initial re-awakening of interest in classical learning came a re-vitalization of Latin, and the texts themselves began to be reviewed with more critical eyes. Such was the intellectual climate which characterized Vittorino's period at Padua; his fame as an educator was ever increasing, and he possessed a sound moral sense coupled with an inclination towards the religious life.

These were the qualities which prompted Gianfrancesco Gonzaga, head of the leading family in Mantua, to seek to appoint Vittorino as a teacher for his sons, and, in 1421, under the patronage of the Gonzaga family, Vittorino founded his famous Mantuan school, to be run on humanistic principles. There, in what was called *La Casa Giocosa* ('The Joyous House'), he taught the Gonzaga children.

The reputation of the school spread to northern Italy, to France, then to Germany, and even to the Greek speaking world. In true humanist fashion, the classical tradition was sought to be reconciled with Italian contemporary life, and was even seen to be compatible with the Christian life and ethic: many humanists came to assume important positions in the Church, notably Ambrogio Traversari, the distinguished Camaldolese monk: he was a close friend of Vittorino, and one who continually sought to ally the seemingly incompatible worlds of the pagan texts of Antiquity and the Christian religion.¹¹

¹¹The topics touched upon here—the history of Renaissance humanism and its effect upon education—have been extensively treated in many books which deal with the Italian Renaissance, but see in particular W.H.Woodward, *Vittorino da Feltre and Other Humanist Educators* (Cambridge, 1897) and *Contributions to the History of Education during the Age of the Renaissance* (Cambridge, 1906). *Italy in the Age of the Renaissance* by Denys Hay and John Law (London, 1989) is a volume which contains chapters on humanism, patronage and the religious life, together with extensive bibliographies for each topic. See also Kate Simon,

Further study of Johannes' comments on his move to Italy sheds more light on his early years: he had at that time a confidence in his own ability as a musician, and these words would suggest that his training in Namur had been a thorough one.¹² But this view of himself was soon dispelled on his meeting Vittorino, and on his first introduction to the works of Boethius. Later in *Ritus Canendi*, he re-emphasises his previous ignorance of Boethius, and it is thus possible to isolate Johannes from any early training in music theory.¹³ This is despite the undisputed leadership of Liège in this sphere since the eleventh century, which culminated in the encyclopaedic *Speculum musicae* of Jacques de Liège, who himself took Boethius as his major authority.¹⁴

Johannes' use of the term 'musicus' is significant: he uses it to describe himself as he once thought he was, and the word reflects that age-old comparison between the singer—the 'cantor' which Johannes had been in Namur—and the true musician—the 'musicus' which he was to become in Italy. The comparison was initially drawn by Boethius, and often cited throughout the Middle Ages: the singer is the servant of the musician, who must be one who is able to make value judgements in musical matters, based upon Reason, which reigns over all.¹⁵ Thus the two broad periods of Johannes' life are not only geographically distinct, but differ also in function and purpose; the periods portray the contrast between 'cantor' and 'musicus'—such a significant feature of medieval music theory.

A Renaissance tapestry (New York, 1988), which vividly treats of the Gonzaga family, and Claudio Gallico's article *Mantua* in *The New Grove Dictionary* (volume 11 p. 635) which is accompanied by an extensive bibliography.

¹²See Note 10 above.

¹³*Ritus Canendi Pars prima* 3.12.20.

¹⁴R. Bragard, ed. *Speculum musicae*, (CSM 3 (Rome 1955-73)) (hereafter Jacques de Liège *Speculum*); Johannes de Ciconia's treatise *Nova musica* was also written in Liège: see S. Clercz, ed. *Johannes Ciconia* 1 (Brussels, 1960).

¹⁵*Ritus Canendi Pars prima* 1.2.4. The rhyming couplets in *Ibid. Pars secunda* 2.1.10 are from Guido's *Regulae rhythmicae* in Martin Gerbert, ed. *Scriptores Ecclesiastici de Musica* (St Blasien, 1867) volume 2 p.25. (hereafter GS). For the emphasis on Reason, see Jan W. Herlinger, ed. *The Lucidarium of Marchetto of Padua* (Chicago, 1985) 16.1.2-11 (hereafter *Marchetto Lucidarium*). For Boethius' original distinction, see Friedlein, ed. *De Institutione Arithmetica libri duo. De Institutione musica libri quinque* (Leipzig, 1867) pp. 223.28-225.15 (hereafter *De Inst. Arith.* and *De Inst. Mus.*)

It would be hard to over-estimate the influence of Vittorino on Johannes, for the powerful forces in the teacher's life—scholarship, humanistic enquiry and religious devotion—were to be the basic elements of Johannes' theoretical work during his Italian period.

The first part of *Ritus Canendi* follows the conventional pattern of the medieval speculative treatises, which have been described as 'rationalistic studies of music as a mathematico-philosophical science'.¹⁶ Such treatises would contain a definition of music, the derivation of the word, speculations on the inventor of music, and a discussion on intervals and their relationship to mathematical ratios.¹⁷ Since Vittorino, through his teaching, is Johannes' only source for his knowledge of Boethius, and since Boethius treats extensively of the relationship of music to mathematics, then Vittorino's influence is easily identifiable.

There is however an added dimension, directly attributable to Vittorino, which makes Johannes a pioneer, and his treatise somewhat of a Renaissance landmark; in true humanistic fashion, Johannes is the first who seeks to shed light upon particular aspects of Greek music theory, and of particular theoretical interest are his interpretative and original comments on the modes of Boethius.¹⁸ Johannes claims to be 'not so much a follower or recommender of the distinguished teacher Boethius, but rather as one who is anxious to expound on the ancient learning as an adherent of it, and a researcher into everything concerning it.'¹⁹

¹⁶See Nan Cook Carpenter, *Music in the Medieval and Renaissance Universities* (Oklahoma, 1968) p.26.

¹⁷All of these elements are contained in *Ritus Canendi Pars prima, passim*.

¹⁸*Ibid. Pars prima* 3.10. and see below pp.38-41.

¹⁹*Ibid. Pars prima* Preface 15: '...neque tam doctoris egregii Boetii cultorem in hac re seu commendatorem, quam et sollicitum proponendae vetustatis in omnibus sectatorem et inquisitorem'.

The second part of the treatise deals almost exclusively with plainchant and its performance; the author indeed strongly denounces not only secular music, but even measured music in the polyphonic style.²⁰ It is therefore not surprising to learn that Johannes became a Carthusian monk while he was at Mantua;²¹ he must have become a member of the Order before the treatise was written, for in it he refers to his 'fellow Carthusians'.²² The move was very possibly inspired by the example of Vittorino—that of a man strongly inclined towards the religious life, and one who would have been anxious to instil devotion in others, and in particular in his own pupils.

In an imaginary dialogue between Ramos de Pareia and himself, John Hothby, the English composer, theorist, and Carmelite monk, writes:

Pareia:

But tell me about that topic which brother Johannes the Carthusian discussed in connection with Marchettus, when he stated that no one has ever heard of three kinds of semitone - namely, the chromatic, the enharmonic and the diatonic. For he says: 'Who has ever heard from any genuine scholar of three types of semitone, unless it is from that fellow Marchettus?'

Hothby:

You have not properly understood my fellow disciple, Brother Johannes Legrense, also a Carthusian, and you are no match for his writings. For the same devotional monk delivered in my presence a lecture in Pavia, which at one time was called Ticinum. He did this because he was anxious for his work to be approved by the university teachers.²³

²⁰ *Ibid. Pars prima* 3.12.14-19.

²¹ *Ibid. Pars prima* Preface 15: 'Mantua tamen....Cartusiae monachum'. The Charterhouse of Mantua was founded in 1408, and, interestingly, was sponsored by the Gonzaga family, who had patronized Vittorino. The foundation is described in *Maisons de l'Ordre des Chartreux-Vues et Notices des Pres*, (Parkminster 1916) volume 3, pp.137-139.

²² *Ritus Canendi. Pars secunda* 1.Preface.7: '...statui non ut prius fratres meos Cartusienses docendo cantum fatigare...'

²³ Albert Seay, ed. *Johannis Octobi Tres Tractaculi contra Bartholomeum Ramum* (CSM 10, Rome, 1964), 51-52:

'Parea: Sed mihi de eo dicere quod frater Johannes Cartusiensis de Marcheto dicere solitus est, a seculo non est auditum triplex ponere semitonium, chromaticum, scilicet, enharmonicum

There is no doubt that Ramos' reference is to our own Johannes, for he paraphrases a comment from *Ritus Canendi*:

Where, pray, since time began, has anyone heard of diatonic, enharmonic and chromatic semitones, except in the writings of Marchetto?²⁴

This paraphrase, and Hothby's reference to Johannes' work ('opus suum' can only refer to the treatise) suggest that Johannes was a fellow disciple of Hothby under the 'doctores' at the University of Pavia²⁵ after the completion of *Ritus Canendi* (1462). Since Hothby was at Lucca from 1467, this must mean that Johannes was at Pavia as a classmate of Hothby, for an unspecified length of time between c.1462 and 1467.

It is significant that Hothby refers to Johannes as 'venerabilis' and as 'dominus'. Though one might assume that the title 'venerable' might be identified with translation to higher rank within a monastic order, according to Carthusian usage it simply means that Johannes was a priest and a choir monk, and likely to have been a member of the Order at the Charterhouse at Pavia until his eventual move to Parma, there to meet the theorist, Nicolaus Burtius, who was to become his pupil.²⁶

atque diatonicum, quia ut ait: Quis umquam audivit ab aliquo vero doctore triplex esse semitonium, nisi ab isto Marchetista.

Ottobi: Non recte intellexisti meum condiscipulum dominum Johannem Legrensem eundemque Cartusiensem, non es eius scriptis par. Idem enim venerabilis religiosus mihi coram oratione sua Papiæ, quæ Ticinum olim appellabatur, exposuit, volens opus suum a doctoribus comprobatum iri...'

For Ramos' words, see Johannes Wolf, ed. *Musica practica* (Publikationen der Internationalen Musikgesellschaft 2. Leipzig, 1901) p.42 (hereafter Ramos *Musica*). Ramos' reference is to *Ritus Canendi Pars prima* 3.1.7.

²⁴See Note 23 above. For Marchetto's division of the whole tone and his resultant semitones, see Introduction pp.23-26.

²⁵Not at the University of Padua, as Palisca suggests, and see his *Humanism in Italian Renaissance Musical Thought* (Yale, 1985) p.280.

²⁶I am grateful to Brother Bruno Holleran of St Hugh's Charterhouse, Parkminster, for information on 'venerabilis' and 'dominus' (strictly *domnus*). Documentation on the existence of the Charterhouses is contained in *Maisons de l'Ordre des Chartreux - Vues et Notices* (Parkminster, 1916) volume 3. The Charterhouse of Pavia is described on pp. 129-136, that of Parma on pp. 113-115, and that of Mantua on pp. 137-139. The Charterhouse of Parma was founded in 1285, and dissolved in 1769, so that clearly it existed during Johannes' time.

At the end of the manuscript of which he himself is the scribe, Burtius provides evidence that Johannes was still a priest and choir monk while at Parma, and records Johannes' death to have taken place in 1474:

Here ends the notable treatise on music, written by the priest and choir monk Johannes Gallicus, a man of great reputation amongst musicians. I, Nicholaus Burtius, first his pupil, and then taking great delight in this topic, have transcribed and notated, in my own hand, his entire work from the copy which he himself had produced. Johannes died in the Year of our Lord 1474, and his soul lies at rest in Paradise. The noble earth of Parma contains his body.²⁷

²⁷Add.22315, fol.60r: 'Explicit liber notabilis musicae venerandi viri, domini Johannis Gallici, multi inter musicos nominis, cuius ego, Nicolaus Burtius, primum discipulus, tunc in ea delectans, totum hunc propria manu ex eo quem ediderat transcripsi ac notavi. Obiit autem vir iste anno Domini MCCCCLXXIV, cuius animam paradisi possidet, corpus vero Parma terra nobilis'. I can make little of Cecil Adkins' comment that Johannes was Vittorino's 'successor' at Mantua and at Parma (*Johannes Legrense* in *The New Grove Dictionary* volume 10 p.615). Werner Gundersheimer's claim (*A Concise Encyclopaedia of the Italian Renaissance* (J.R.Hale, ed. London, 1981, p. 342) that Vittorino's school did not long survive him is supported by W.H.Woodward's detailed account of Vittorino's death, for there is no mention here of Johannes, or indeed of any successor (and see W.H.Woodward *op.cit.* pp. 89-92).

CHAPTER TWO

ASPECTS OF GREEK MUSIC THEORY IN
BOETHIUS' DE MUSICA AND IN RITUS CANENDI

Despite Johannes' claim that Vittorino taught him grammar as well as music, and that Vittorino was a man deeply learned as much in Greek as in Latin literature,¹ several factors would seem to work against the suggestion that Johannes must have been one of the earliest theorists to benefit from the knowledge of Greek texts which was to characterize the Renaissance.² First, Giovanni Aurispa, in a letter to Ambrogio Traversari, says that he regarded Vittorino as no more than a mediocre Greek scholar.³ It seems too that, at Vittorino's school, there was less emphasis on Greek than on Latin grammar.⁴ These two factors alone make it hard to believe that Johannes was, as a result of Vittorino's teaching, in a position to read treatises in the original Greek, and to assimilate their technicalities. We know from a memorandum of Ambrogio Traversari of 1433 that Vittorino's library contained the *Musica* of Aristides Quintilianus and that of Bacchius Senior.⁵ The same volume contained the *Musica* of Ptolemy,⁶ but there is no suggestion that Johannes was directly familiar with the contents of any of these; Ptolemy is the only Greek author whom he cites, and this only through his knowledge of Boethius.⁷ Lastly, we

¹*Ritus Canendi Pars prima* 1 Preface 14: '....Italia vero qualemcumque sub Victorino Feltrensi, viro tam litteris Graecis quam Latinis affatim imbuto, grammaticum et musicum.....'

²See Gilbert Reaney *The Musical Theory of John Hothby* in *Revue belge de musicologie* XL11 (1988) p. 126.

³This is a comment identified by W.H.Woodward in *Vittorino da Feltre and Other Humanist Educators* (Cambridge, 1897) p. 51: 'Victorinus quidam....litteras Graecas mediocriter eruditus.'

⁴*Ibid.* p. 50

⁵Aristides Quintilianus *De Musica*, ed. R.P.Winnington-Ingram (Leipzig, 1963). The Bacchius Senior treatise is edited by C.von Jan in *Musici Scriptores Graeci* (Leipzig, 1895, repr. 1962) pp. 283-316 (hereafter JanS) and see Traversari, *Hodoeporicon*, ed. Alessandro Dini-Traversari in *Ambrogio Traversari e suoi tempi* (Florence, 1912), p. 73: 'Quintiliani Musicam et alterius senis de Musica opus....'

⁶Ptolemy *Harmonics* ed. I. Düring 7 (Goteborg, 1930). This is recorded in a letter to Niccolo Nicedi, and see Mehus, ed. *Traversari Epistolae* 2, pp. 418-419: 'Offendimus de Musica volumina Claudii Ptolomaei....in eodem volumine'.

⁷*Ritus Canendi Pars prima* 3.10.6: '...Ptolomeus, grandis inter caeteros musicus....'

know that the theorist Gaffurio, as late as 1490, and almost twenty years after Johannes' death, was inspired to commission others to provide Latin translations of some of the Greek treatises.⁸

Aspects of Greek music theory were thus transmitted to the Middle Ages through Latin texts⁹ –the *De Institutione Musica* of Boethius,¹⁰ the *Commentarius in Somnium Scipionis* of Macrobius,¹¹ the *De Nuptiis Philologiae et Mercurii* by Martianus Capella,¹² and the relevant part of the *Institutiones divinarum et humanarum litterarum* of Cassiodorus.¹³ Boethius' *De Musica*, a theoretical and speculative work, remained unchallenged throughout the Middle Ages, and medieval writers would have been aware neither of its Greek sources, nor of the significance of the theoretical concepts expounded in the text. One may with some justification wonder whether, during the later Middle Ages, musicians felt it to have any relevance, and to what extent it was read and understood, though the large number of manuscripts of the treatise is proof enough of its wide circulation. However, it was characteristic of the Renaissance humanists, as we have seen, to reawaken interest in the Greek and Latin texts of Antiquity, and it was within this context that a reappraisal of Boethius began to develop; it is Johannes' contribution to this process of appraisal which is our concern. The often adulatory references to Boethius, and the frequent direct quotations from *De Musica in Ritus Canendi* show Boethius to be a major authority, and reflect the veneration in which he was held by Johannes. Other writers held a similar position: John Hothby, the English theorist, defended Boethius against the stern criticisms of

⁸For this information, and indeed for the discussion on the contents of Vittorino's library, I am indebted to Claude Palisca's *Humanism in Italian Renaissance Musical Thought* (Yale, 1985).

⁹But Boethius was to be Johannes' only source, and see below.

¹⁰For the bibliographical details of *De Musica*, see Chapter One, page 7, footnote 15.

¹¹The *Commentarius* has been translated, with an Introduction, by William H. Stahl (New York, 1952).

¹²Translated by William H. Stahl and R. Johnson, with E. L. Burge, as *Martianus Capella and the Seven Liberal Arts* (New York, 1977).

¹³The music section is translated by Helen Dill Goode and Gertrude C. Drake as *Institutiones humanarum litterarum* (Colorado Springs, 1980).

Ramos da Pareia, and Burtius, the pupil of Johannes, and one of the scribes of *Ritus Canendi*, reflects his teacher's views.¹⁴ It is tempting to regard these writers as a school of theorists united in their attempts to attack those who would dare to seek to undermine that universal and timeless knowledge revealed in the pages of *De Musica*.

SOUND PITCH AND INTERVAL

The first three books of Boethius' *De Musica* derive from the Greek theorist Nicomachus, whose *Manual (Harmonicum enchiridion)* is no more than a brief summary of a lengthy lost work from the same pen.¹⁵ Calvin Bower argues in favour of the view that the fourth book is also by Nicomachus;¹⁶ the fifth book on the other hand is based on the *Harmonics* of Ptolemy.¹⁷

Nicomachus draws a distinction between sound as a feature of the natural world, and the concept of 'a sound' as a specific pitch in a musical context. The first he defines as 'a disturbance of the air particles which remains intact until it reaches the ear'.¹⁸ A single musical pitch (φθόγγος) he defines as 'the musical resolution of the voice onto a particular pitch'.¹⁹

Although it is possible to view intervals as audible manifestations of mathematical ratios in the Pythagorean manner, Nicomachus initially describes

¹⁴A. Seay, ed. *Johannis Octobi Tres Tractaculi contra Bartholomeum Ramum* in CSM 10 (Rome, 1964); Ramos *Musica practica*; G. Massera, ed. *Nicolai Burtii Florum Libellus* (Florence, 1975) (hereafter *Burtius Florum Libellus*).

¹⁵Edited by Jan in JanS pp. 235-282.

¹⁶See Calvin Bower, *Boethius and Nicomachus: an essay concerning the sources of De Institutione Musica* in *Vivarium* 16 (1978) pp. 1-45.

¹⁷See Note 6 above.

¹⁸Nicomachus *Manual* iv in JanS p. 242: 'Καθόλου γάρ φαμεν ψόφον μὲν εἶναι πληξίν ἀέρος ἀθρυπτον μέχρι ἀκουῆς'. Boethius (*op. cit.* 1,3 (189. 22-23)) translates the sentence thus: 'Idcirco definitur sonus percussio aeris indissoluta usque ad auditum' (*Ritus Canendi Pars prima* 1.3.6.) For a translation of the original Greek, see Andrew Barker, ed. *Greek Musical Writings* Volume 2 (Cambridge, 1989) p. 253 (hereafter *Barker Greek Musical Writings*).

¹⁹*Manual* xii in JanS p. 261: ἐπίπτωσις φωνῆς ἐπὶ μιᾶν τάσιν καὶ ἀπλήν (Barker *op.cit.* 266); *De inst. mus.* 1,8 (195.2) 'vocis casus emmeles....in unam intentionem' (*Ritus Canendi Pars prima* 1.3.7.)

'interval' simply as the 'distance between a high and a low sound'.²⁰ He later draws the distinction between consonant and dissonant intervals:

Of the intervals, some are consonant, and some dissonant. Intervals are consonant when the notes which embrace them, being of different pitch, are *struck at the same time* (ἅμα κρούσθεντες) and sound once; they then relate to each other in such a way that *one sound and one sound only* (ἔνοειδή τήν...φωνήν...καὶ δῖόν μιᾶν) is produced from them.

Intervals are dissonant when, from the two separate sounds, a kind of split, or unpleasant sound, presents itself to the ear.²¹

The phrases 'ἅμα κρούσθεντες' and 'ἔνοειδή τήν...φωνήν...' show that Nicomachus is referring to harmonic intervals—musical events which involve the simultaneous sounding of two single pitches. Boethius translates the first of these as 'simulque pulsi', the second as 'in unum coniunctae':

For when two strings, one higher than the other, are tuned and struck at the same time, they produce an intermingled sweet sound. Then occurs what is called a consonance. On the other hand, when the strings are struck at the same time, and each desires to go its own way,....then occurs what is called dissonance.²²

Boethius also draws the distinction between *interval* and *consonance*, and it is thus clear that it is the concept of 'consonantia' as a harmonic interval which he transmits to the Middle Ages:

²⁰*Manual* xii (JanS p. 261): Διαστήμα δ' ἐστὶ δυὸν φθόγγων μεταξύτης (Barker *op.cit.* p. 266), Boethius *op.cit.* 1,8 (195,6): 'Intervallum vero est soni acuti gravisque distantia' (*Ritus Canendi Pars prima* 1.3.8.)

²¹*Manual* xii JanS pp. 261-262). (Barker *op.cit.* p. 267).

²²*De inst. mus.* 1,28 (220.3-7): 'Quotiens enim duo nervi uno graviore intenduntur simulque pulsi reddunt permixtum quodammodo et suavem sonum, suaeque voces in unum quasi coniunctae coalescunt; tunc fit ea quae dicitur consonantia. Cum vero simul pulsus sibi quisque ire cupit....tunc est quae dicitur dissonantia'.

....and if EK and KF are both struck in turn with an additional plectrum, the interval of a diatessaron will sound, whereas if they are both struck at the same time, I come to recognize the consonance of the diatessaron.²³

Nevertheless, the term *consonantia* is used in medieval theory in a melodic sense—that is, in discussions of intervals which are permissible in melody. The usage seems to have had its origins in the *Dialogus de musica*, the treatise previously attributed to Odo of Cluny,²⁴ but shown by Michel Huglo to have been written by an anonymous Italian from the Milan area, now referred to as Pseudo-Odo.²⁵ The treatise is in dialogue form—redolent of *Musica enchiriadis*—and here the author discusses the 'conjunction of sounds':

Pupil: To what am I to direct particular diligence?

Teacher: To the conjunction of sounds which form various consonances, so that, just as they are various and different, you may be able to pronounce each of them opportunely in a dissimilar and different manner.

Pupil: How many differences there are, I pray you to teach me, and show me by examples in common use.

Teacher: There are six, both in descent and ascent. The first conjunction of sounds is when we join two sounds, between which there is one semitone....a consonance closer and more restricted than any other.²⁶

It is the melodic use of the term which prompts Marchetto of Padua's strong criticism of Guido d'Arezzo, who also speaks of the six consonances of the pitches.²⁷ In *Lucidarium* (1318), Marchetto misunderstands Guido's

²³*De inst. mus.* 4,18 (348.24-349). '....atque alterutra vicissim EK et KF plectro adhibito pellantur, diatessaron distantia consonabit, sin vero simul utrasque percussero, diatessaron consonantiam nosco'.

²⁴See GS I pp. 252-302.

²⁵The question of authorship is discussed by Huglo in the article *Odo* in *The New Grove Dictionary* volume 13 p. 504.

²⁶The translation is from Oliver Strunk, *Source Readings in Music History* (New York, 1950) p. 109. For the Latin text, see GS I p. 255: '(D) In quibus maxime diligentia adhibenda est? (M) In coniunctionibus vocum quae consonantias faciunt diversas, ut sicut diversae sunt ac differentes, ita dissimiliter ac differenter unamquamque earum opportune pronuntiare prevaleas. (D) Quot sunt differentiae precor edicere & communibus exemplis ostende. (M) Sex sunt tam in depositione quam in elevatione. Prima vocum coniunctio est cum illae duae voces iunguntur inter quas unum est semitonium....quae consonantia omnibus contractior et strictior est.'

²⁷Jos. Smits van Waesberghe, ed. *Guidonis Aretini Micrologus* (CSM 4, Rome 1955) 4,12 (p. 105) (hereafter *Guido Micrologus*).

consonances to be harmonic intervals in the Boethian tradition, and clearly cannot submit to the view that the tone—even less the semitone—can be classified as a consonance:

Guido's ignorance is then manifest: he asserted that these intervals are species of consonance, whereas they are only members of consonant intervals, as has been pointed out.²⁸

Johannes in his turn defends Guido against Marchetto's attack, taking Boethius as his authority:

For Boethius, whom you have read and not understood..... refers to the diatessaron, the diapente and the tone as consonances.²⁹

Boethius writes:

Nam si vox voce duplo sit acuta vel gravis, diapason consonantia fiet, si vox voce sesquialtera proportione sit vel sesquitertia vel sesquioctava acutior graviorque, diapente vel diatessaron vel tonum consonantiam reddet....³⁰

Boethius explains that the two pitches which relate to the duple ratio (2:1) produce the diapason—the octave; the sesquialter (3:2) relates to the diapente (the fifth), the sesquitertial (4:3) to the diatessaron (the fourth), and the sesquioctave (9:8) to the *tonus* (whole tone). The Latin text can easily mislead, given the adjacency of 'tonus' and 'consonantiam', which words can with grammatical justification be translated as 'the consonance of the tone'. It is strange that 'consonantiam' is a singular form, if Boethius were truly embracing all three intervals as consonances, but we can only accept the oddity of the word order, and surmise that the true meaning is as follows:

²⁸Marchetto *Lucidarium* 9.1.12: 'Patet igitur ignorantia Guidonis, qui has coniunctiones, que, ut predicatur, membra consonantiarum sunt, esse consonantiarum species asserebat'.

²⁹*Ritus Canendi Pars secunda* 1.3.11: 'Nam et Boethius, quem legisti nec intellexisti.... diatessaron diapente et tonum consonantias vocat'.

³⁰*De inst. mus.* 1,16 (201.4-202.2).

.....diapente (consonantiam) vel diatessaron (consonantiam) vel tonum reddet.

In the light of this interpretation of the Latin text, it follows that Johannes must have misunderstood Boethius, whose 'consonances' are harmonic intervals. However, since Johannes overlooks Boethius' definition of such intervals, it is possible that he is following here the definition adopted by Guido for use in connection with melodic intervals.

INTERVALS AND PYTHAGOREAN RATIO

Boethius recounts the legend which states that Pythagoras, while passing a blacksmith's shop, was conscious of the fact that the anvils, when they were struck, were sounding consonances in relation to each other.³¹ He surmized that the different pitches were the result of the application of varying degrees of force by the hammers themselves, but on closer inspection, he discovered that a hammer weighing 12 pounds, together with a hammer of half the weight, produced between them the consonance of the diapason (the octave). Boethius continues:

The hammer of 12 pounds with that of 9 (and the hammer of 8 with that of 6) joined in the consonance of the diatessaron according to the epitrita ratio. The one of 9 pounds with that of 6 (as well as those of 12 and 8) commingled the consonance of the diapente. The one of 9 with that of 8 sounded the tone according to the sesquioctave ratio.³²

³¹*De inst. mus.* 1,10 (196). For the Greek source which deals with Pythagoras' discovery, see Nicomachus' *Manual* 6 in JanS pp. 245-6 (Barker, *op.cit.* pp. 256-258).

³²*De inst. mus.* 1,16 (198.2-8): 'Malleus vero XII ponderum ad malleum VI ponderum secundum epitritam proportionem diatessaron consonantia iungebatur. VIII vero ponderum ad VI et XII et VIII diapente consonantia permiscebant. VIII vero ad VIII in sesquioctava proportione resonabant tonum.' The English translation is by Calvin Bower in *Boethius, Anicius Manlius Severinus: Fundamentals of Music* translated by Calvin M. Bower and ed. Claude V. Palisca (Yale 1989) p. 19 (hereafter *Bower/Boethius*). 'Epitrita' is the Greek word for 'sesquitertia'.

It is this close alliance of musical interval and mathematical ratio which lies at the heart of the Pythagorean view, as Boethius attests:

Thus this was mainly the reason that Pythagoras, having forsaken aural judgement, turned to reason. He did not trust the human ears, which are subject to radical change....³³

Both Boethius' and Johannes' accounts of the mathematical ratios are extensive, and can helpfully be summarized here.

Those ratios which can be allied to the consonances are confined to those which can be expressed by the first four numbers. The multiple ratios relate to the diapason (the octave), the bisdiapason (the double octave) and the terdiapason (the triple octave); expressed in mathematical terms, we have the 2:1, the 3:1 and the 4:1 ratios.

With the superparticular ratios are allied the diapente (the fifth with the ratio of 3:2, called the sesquialter) and the diatessaron (the fourth with the ratio of 4:3, called the sesquitercian), and the whole tone (with the ratio 9:8, called the sesquioctaval, which cannot be allied with a consonance). Since the interval of the fourth is made up of two whole tones plus a semitone, then the semitone can be expressed in Pythagorean terms as the difference between 9:8 x 9:8 and 4:3, ie 256:243; however, this ratio represents only the minor semitone.³⁴

³³*De inst. mus.* 1,10 (196.18-21): 'Haec igitur maxime causa fuit, cur relicto aurium iudicio Pythagoras ad regularum momenta migraverit, qui nullis humanis auribus credens...qui accidentibus permutantur'.

³⁴For the relationships of the mathematical ratios to musical intervals, see *De inst. mus.* I, 4-7, and *Ritus Canendi Pars prima Liber secundus*. For the proportion assigned to the minor semitone, see *De inst. mus.* 1,17 (204) and *Ritus Canendi Pars prima* 2.12.23.

The unequal division of the whole tone

The major semitone (the *apothome*) results from the difference between the minor semitone and the whole tone. The Pythagorean argument runs as follows:

$$256:243 \times 8 = 2048:1944 = \text{minor semitone}$$

$$1944 \div 8 = 243$$

$$243 + 1944 = 2187$$

$$2187:1944 = 9:8 = \text{whole tone}$$

$$2187:2048 = \text{apothome} = \text{major semitone}^{35}$$

The argument that the whole tone cannot be divided equally is supported by the thesis that a superparticular ratio, such as the sesquioctave, cannot equally be divided into two parts:

$$9:8 + 9:8 = 18:16$$

1/17 is a smaller fraction than 1/16

Thus 17 cannot represent the halfway point between 16 and 18

Thus the 9:8 ratio cannot be equally divided.³⁶

There are in *Ritus Canendi* two seemingly contradictory arguments:

1. Part I 2.10.26: here is drawn a diagram which sets out what seems to be Johannes' view that the minor semitone is allied to the 18:17 ratio, and the major semitone in the 17:16 ratio.
2. Part I 2.12.20: here Johannes upbraids Marchetto for misunderstanding Boethius, and for putting forward the view as in 1. above:

³⁵*De inst. mus.* 1,17 (263-264); *Ritus Canendi Pars prima* 2.12.27.

³⁶*De inst. mus.* 1,16 (202,17), *Ritus Canendi Pars prima* 2.9.25-26.

For Marchetto claims that the major semitone consists of the 17:16 ratio, while the minor semitone involves the 18:17 ratio; this statement Boethius categorically denies in the seventeenth chapter of his first book.³⁷

The diagram can easily mislead, but Johannes' criticism of Marchetto must mean that he cannot regard the 18:17 ratio as truly representing the minor semitone, and he rightly claims that Marchetto has misunderstood Boethius. The demonstration of the indivisibility of the 9:8 ratio is meant to be no more than an arithmetical proof in support of the argument.

Commentators have attempted to ally these two accounts, though unnecessarily, since Boethius meant the 18:17:16 argument to be no more than an arithmetical proof, and not a true Pythagorean representation of the two semitones. Mark Lindley claims that Johannes' arithmetic is inconsistent,³⁸ but since the purpose of the two arguments is different, this would not seem to matter. Cecil Adkins takes the first as a commitment on Johannes' part to the view that the semitones do lie in the 18:17:16 ratios, but at the same time he overlooks his criticism of Marchetto and the true Pythagorean ratios which Johannes assigned to the semitones. Adkins does however state that, as far as the monochord is concerned, the difference between the two arguments is negligible.³⁹

Johannes, following Boethius, subjects the whole tone to further analysis: since two minor semitones cannot equal a whole tone, then the *comma* makes up the difference. If the minor semitone is itself subdivided into two *dieses*, then the whole tone is made up of five constituent parts:

³⁷*Ritus Canendi Pars prima* 2.12.19: 'Dicit enim maius semitonium in proportione sesquiseptadecima consistere, et minus in sesquiseptima decima, quod Boetius in primo libro suae musicae capitulo septimodecimo, negat aperte.' For Marchetto's claim, see *Lucidarium* 4.11.4. For Boethius' claim, see *De inst. mus.* 1,18 (204): '....estque verum semitonium minus ducentorum quadraginta trium ad CCLVI comparatio.'

³⁸Mark Lindley, *Pythagorean intonation and the rise of the triad* in Royal Musical Association Research Chronicle 16 (1980) p. 10.

³⁹Cecil Adkins, *The Theory and Practice of the Monochord* (Dissertation University of Iowa, 1963) p. 216.

minor semitone	minor semitone	comma
two dieses	two dieses	comma
W H O L E T O N E ⁴⁰		

The equal division of the whole tone

Hothby's references to his classmate Johannes Legrense occur in a passage which centres around the semitones which are peculiar to Marchetto,⁴¹ who had boldly proposed the division of the whole tone into five equal segments, which he called 'dieses'. These are not to be confused with the dieses of Pythagorean theory, with its alternative meanings.⁴² From the basic unit of the diesis, Marchetto produced three semitones: the 'enharmonic semitone' of two fifths of the tone, the 'diatonic' of three fifths, and the 'chromatic' of four fifths.⁴³ The make-up of the tone could thus be expressed either as an enharmonic plus diatonic semitone, or as a chromatic semitone plus diesis.

The innovation strikes at the heart of that aspect of Pythagorean theory, which proves that the whole tone cannot be divided equally: Prosdocimus da Beldemandis strongly attacks Marchetto's five fold division in his *Tractatus musice speculative* (1425):

The whole tone....is not in any way divisible into equal parts: neither into two halves nor three thirds nor four fourths nor five fifths nor six sixths and so forth.⁴⁴

⁴⁰*Ritus Canendi Pars prima* 3.2.14 following Boethius *De inst. mus.* 3,8 (278). But for observations on the terminology, see *Ritus Canendi Note Pars prima* 3.2.12.

⁴¹See Introduction pp. 9-10.

⁴²See *Ritus Canendi Note Pars prima* 3.2.12

⁴³Marchetto *Lucidarium* 2.6.2; 2.7.13-14.

⁴⁴*Tractatus musice speculative contra Marchettum de Padua* in D Reffaello Baralli and Luigi Torri *Il "Trattato di prosdocimo de Beldomandi" contro Il "Lucidario" di Marchetto da Padova* in *Rivista musicae Italiana*, XX (1913) p. 743: Tonus....nullo modo divisibilis est partes equales....

It must also be the case that the dieses of Marchetto cannot be measured accurately and in Pythagorean terms, with the result that he can deal only with approximations. He identifies his enharmonic semitone with the traditional minor semitone, the Platonic *limma*:

Two of these five intervals joined together make up the "enharmonic" semitone, which is the smaller. Plato called it the *limma*; it contains two dieses.⁴⁵

The larger semitone (the *apotome* of traditional theory) he 'equates' with his diatonic semitone:

Three of these dieses make up the "diatonic" semitone, which is the larger; it is called the major apothome, that is, the larger part of a whole tone divided into two.⁴⁶

Marchetto makes further identifications: the 18:17 ratio he assigns to the *limma* (the minor semitone), and the 17:16 ratio is identified with the major semitone.⁴⁷ These are again, as we have seen, approximations to the traditional Pythagorean ratios, and become the target of Johannes' criticism.⁴⁸ He writes:

For he (ie Marchetto) had read in the *De Musica* of Boethius about the three melodic genera, and thought that the terms used for the tetrachords were those of the three types of semitone. Where, pray, since time began, has anyone heard of diatonic, enharmonic and chromatic semitones, except in the writings of Marchetto? ⁴⁹

⁴⁵Marchetto *Lucidarium* 2.5.25: 'Due autem simul iuncte ex istis quinque componunt semitonium enarmonicum, quod minus est, quod a Platone vocatum est lima, continens duas dyeses'.

⁴⁶*Lucidarium* 2.5.27: 'tres vero ex istis dyesibus faciunt semitonium dyatonicum, quod maius est, quod quidem vocatur apotome maius, id est pars maior toni in duas divisi'. The English translations from *Lucidarium* are by Herlinger.

⁴⁷*Lucidarium* 2.9.9. and 2.9.12.

⁴⁸See above, p. 25

⁴⁹*Ritus Canendi Pars prima* 3.1.6-7: 'Legerat enim in musica Boetii de tribus generibus melorum, et putavit esse vocabula tetrachordorum nomina trium semitoniorum. Ubi precor a saeculo fuit auditum praeter a Marchetto semitonium diatonicum enarmonicum et chromaticum?'

We have seen that Johannes is ready to criticize Marchetto for misunderstanding Boethius;⁵⁰ his comment here is cursory, even derisory, and occurs in a chapter dealing with the Greek tetrachords, not, as one might be led to expect, in connection with Pythagorean division of the tone.⁵¹ He is even ready to overlook Marchetto's approximations, and in contrast to Prosdocimus, his attack seems to be not so much against the concept, but the terminology.

A second reference to Marchetto's semitones follows immediately on Johannes' own five-fold division:

In this then—the fact that Marchetto claimed that his semitones were made up of two dieses—despite his error, he was actually right. His mistake lay, I say, in referring to this as an enharmonic, rather than a diatonic or chromatic semitone. For...the minor semitone is one and the same in every genus, though his statement that it is made up of two dieses is not a foolish one.⁵²

It is clear that Johannes' criticism is far less weighty than that of Prosdocimus, and here again, the emphasis is on terminology. It appears that Johannes would prefer an exchange of terms, so that the diatonic semitone would be identified with the traditional minor semitone. This passage is a curious one, since it suggests that Johannes is prepared to accept Marchetto's approximations. This however would be inconsistent with his strong and lengthy criticism of his

⁵⁰See above p. 21.

⁵¹For the Greek tetrachords, and their function within the Greek Greater Perfect System, see below pp. 26-29.

⁵²*Ritus Canendi Pars prima* 3.2.14-15: 'In hoc ergo, quod Marchettus primum de suis semitoniis duas habere dieses asseruit, errando veraciter non erravit. Erravit inquam illud appellando magis enarmonicum quam diatonicum aut chromaticum, nam, ut dixi superius, unum est et idem in omni genere minus semitonium, quamquam dicendo duas dieses habet non desipuerit.'

For Ramos da Pareia's apparent approval of Johannes' criticism of Marchetto, see above p.10. It is not surprising that John Hothby (*op.cit.* p. 52) disagrees with Ramos. Hothby says that Johannes was not attacking the terminology, but the concepts: 'In pursuit of his aims', he says that 'he had not censured Marchetto for his word usage, but rather for the ideas which were based on falsehoods from the same pen' ('cum ea quae optabat assequutus est non reprehendisse Marchettum vocabulorum sed ipsarum rerum ab eodem sub illis falso reconditarum' (*sic*)). It does seem here that it is Hothby, not Ramos, who has misunderstood Johannes. Ramos was here attacking Hothby's own three semitones.

18:17:16 ratios.⁵³ It may be that he was secretly attracted to Marchetto's coinage of the term 'diatonic'—despite its alliance with the apothome—for to describe the minor semitone as 'diatonic' would relate well with the role of the minor semitone in the diatonic Greater Perfect System of Antiquity.⁵⁴ Far less attractive to Johannes would have been the anti-Pythagorean simplicity of Marchetto's system, its appeal to practising musicians, and its ability to accommodate the chromaticisms which were characteristic of Italian music at the beginning of the Trecento.⁵⁵

THE GREEK PERFECT SYSTEMS

Boethius describes the gradual development of the Greater Perfect System from a series of four pitches to a system which eventually accommodated fifteen.⁵⁶ Its intervallic structure corresponded to the familiar double octave which extends from A to a. The immutable building block of the whole system was the tetrachord—a series of four pitches related to each other by a constant order of tones and minor semitones. This order, in descent, was tone, tone, semitone, so that the tetrachord could be contained within two series of pitches corresponding to A G F E and E D C B.

The complete system is represented in terms of four tetrachords, together with the *proslambanomenos* (the 'added note'). It is seen that two relationships were

⁵³See above p. 22.

⁵⁴See below—THE GREEK PERFECT SYSTEMS

⁵⁵For a full commentary on Marchetto's divisions of the tone, its influence and importance, see Jan W. Herlinger, *Marchetto's Division of the Whole Tone* in JAMS 34 (1981) pp. 193-215.

⁵⁶*Ritus canendi Pars prima* 1.4–1.8. Boethius (*De inst.mus.* 1,19 (205.28-206.15)) says, on the authority of Nicomachus, that there was at the beginning a very simple music played on four strings, and that these had been invented by Mercury. Nicomachus agrees with the attribution to Mercury (Hermes) but says that the original *kithara* (lyre) had seven strings (*Fragment I* in JanS 2 p. 66). Boethius says that the outer strings were an octave apart, and that the middle strings produced a fourth and a fifth between them ('...ut primus quidem nervus et quartus diapason consonantiam resonarent, medii vero ad se invicem atque ad extremos diapente et diatessaron....'). Johannes follows this description (*Ritus Canendi Pars prima* 1.4.12-14), but credits Jubal with their invention (*Ibid. Pars prima* 1.4.9.). He is clearly mistaken in referring to such pitch relationships as a 'tetrachord' (*Ibid. Pars prima* 1.4.11.)

possible between the tetrachords: they were either linked by a note which was common to both of them and were then 'conjunct', or they were separated by a whole tone, and were said to be 'disjunct'. Each note had its own name, made up of two words: the first described the position of the note within the tetrachord, and the second the position of the tetrachord within the System. The discrepancy between the 'highest' and 'lowest' pitches probably refers to the position of the tetrachords on the instrument: the lyre player would have held his instrument in such a way that the high pitched strings were in a low position, and low pitched strings in a high one, similar to the modern guitar.

The diagram overleaf represents the Greater Perfect System as described in *Ritus Canendi*.

	a	Nete hyperboleon	Lowest of the Extra Tetrachord
Tetrachordon Hyperboleon	g	Paranete hyperboleon	Next to the lowest of the Extra Tetrachord
Extra Tetrachord	f	Trite hyperboleon	Third of the Extra Tetrachord
—————	e	Nete diezeugmenon	Lowest of the Tetrachord of Disjunction
Tetrachordon Diezeugmenon	d	Paranete diezeugmenon	Next to the lowest of the Tetrachord of the Disjunction
Tetrachord of the Disjunction	c	Trite diezeugmenon	Third of the Tetrachord of Disjunction
—————	b	Paramese	Next to the Middle
—————	a	Mese	Middle
Tetrachordon Meson	G	Lichanos meson	Index Finger of the Tetrachord of the middle
Tetrachord of the Middle	F	Parhypate meson	Next to the highest of the Tetrachord of the Middle
—————	E	Hypate meson	Highest of the Tetrachord of the Middle
Tetrachordon Hypaton	D	Lichanos hypaton	Index Finger of the Highest Tetrachord
Highest Tetrachord	C	Parhypate hypaton	Next to the highest of the Highest Tetrachord
—————	B	Hypate hypaton	Highest of the Highest Tetrachord
	A	Proslambanomenos	Added Note

THE GREEK GREATER PERFECT SYSTEM

There was also a Lesser Perfect System, which made possible a kind of modulation. The system consisted of eleven notes—the octave from the proslambanomenos to the mese of the Greater System, plus the *Tetrachordon Synemmenon* (the 'hooked' tetrachord) which was added conjunctly to the mese, thus providing a further tone, tone, semitone progression:

d	Nete synemmenon
c	Paranete synemmenon
b flat	Trite synemmenon
a	Mese

The discussion so far has been confined to the diatonic form of the System, in which the tetrachords consist of stepwise progressions. Johannes also discusses two other genera, the chromatic and the harmonic, but it is the diatonic structure which emerges as the one which is relevant for him. Each genus depends upon a distinctive way of filling in the interval of the fourth (the diatessaron), and the tuning of the interval itself is invariable. The tetrachords in these additional genera contain gaps—one in each. The tetrachord is chromatic if it involves the progression semitone, semitone, three semitones: if the tetrachord embraces the progression diesis, diesis, ditone, it is said to be enharmonic.⁵⁷

Since the character of the diatonic tetrachord depends on its internal order of tones and minor semitones, then it is clear that it is possible to alter this order to produce progressions of a different character within the same interval. To each different way of filling in intervals the term *species* was applied, but only to those intervals which formed the consonances—the diatessaron (fourth), the diapente (fifth), and the diapason (octave):

⁵⁷*Ritus Canendi Pars prima* 3.2 and 3.1. For Johannes' use of 'diesis', see above p.23 and *Pars prima* Note 3.2.12.

A species... involves an order of pitches which has a particular structure according to the make up of each genus; this order is set within the limits of any one numerical ratio which produces a consonance.⁵⁸

Various combinations of the three diatessaron species and the four diapente species are able to produce seven species of diapason. Gaudentios, writing in the second century AD, is the only Greek writer to classify the octave species in terms of the other two species, though Cleonides at about the same time and Bacchius Senior (fourth century AD) classify the species but omit the analysis.⁵⁹ Interestingly, Johannes makes mention of the classification of the diatessaron species which is characteristically Greek, and differs from that of the medievalists; Like Gaudentios, he specifies the placement of the species within the System, and projects them thus:

First diatessaron species	from the hypate hypaton to the
semitone, tone, tone	hypate meson (B to E) - the tetrachord
Second species	from the parhypate hypaton to
tone, tone, semitone	the parhypate meson (C to F)
Third species	from the lichanos hypaton to
tone, semitone, tone	the lichanos meson (D to G) ⁶⁰

GREEK TONALITY AND BOETHIAN MODALITY

The tetrachord was the only species of diatessaron to have any relevance in Greek theory, but the octave species assumed an importance which was not enjoyed by the other two—the diapente and the diatessaron. The Greater Perfect

⁵⁸*Ibid. Pars prima* 3.5.11. following Boethius *De inst. mus.* 4,14 (337.22-25): 'Species autem est quaedam positio propriam habens formam secundum unumquodque genus in uniuscuiusque proportionis facientis terminis constituta'.

⁵⁹Gaudentios *Isagoge* 19 in JanS p. 346; for Bacchius Senior *Introductio artis musicae* see JanS pp. 308-9; For Cleonides' *Eisagoge*, see JanS pp. 167-207, and in particular p. 182.

⁶⁰*Ritus Canendi Pars prima* 1.7.9-10: 'Est autem eius prima species ab hypate hypaton in hypate meson secundum Graecos....Secunda vero pergit....' Gaudentios' classification is *Eisagoge* 18 (JanS. 345), and Boethius' second classification of the diatessaron species, though not so specific in that it mentions the pitch names, corresponds with it (*De inst. mus.* 4,14 (345)). It is possible that Johannes' source is a Latin translation of *Eisagoge*, which is now lost.

System embraced seven such octave species, all of which, with the exception of the Dorian octave, cut across the tetrachordal divisions:

b c d e f g a b	Mixolydian
c d e f g a b c	Lydian
d e f g a b c d	Phrygian
e f g a b c d e	Dorian
f g a b c d e f	Hypolydian
g a b c d e f g	Hypophrygian
a b c d e f g a	Hypodorian

The fourth of these arrangements—the Dorian octave—was known as the *central octave*, and preserved intact two disjunct tetrachords:

e f g a b c d e

When the Greater System was placed within a specific range of pitch, or presented as seven species of the double octave, the procedure was known as a *tonos*. Aristoxenus proposed thirteen such *tonoi*,⁶¹ which arose simply out of transpositions of the system. Ptolemy's *tonoi*, on the other hand, involve the seven double octave species, which as the diagram overleaf shows, have the capacity to:

1. bring the octave species within the central octave;
2. present seven different placements of the Dorian octave;
3. produce seven distinct distributions of the System, with the consequent changes of position of the Proslambanomenos (P), the Nete hyperboleon (N), and the Mese (M).

⁶¹No complete account of the *tonoi* of Aristoxenus survives. It was Aristides Quintilianus' claim that, according to Aristoxenus, there were thirteen *tonoi* (R.P. Winnington Ingram, ed. *De Musica*, (Leipzig, 1963) chapter 10) (*Greek Musical Writings* p. 421).

These distributions also produce transpositions of the System. Each *tonos* assumed the name of the particular species which was brought within the range of the central octave.

A	A	A	A ^N	A	A	A
G	G#	G# ^{PN}	G	G	G#	G
<u>F#</u>	<u>F#^{PN}</u>	F#	F	F#	F#	F
E ^{PN}	E	E	E	E	E	E
D	D	D#	D	D	D#	D ^M
C	C#	C#	C	C#	C# ^M	C
B	B	B	B	B ^M	B	B ^b
A	A	A#	A ^M	A	A	A
G	G#	G# ^M	G	G	G#	G
F#	F# ^M	F#	F	F#	F#	F
<u>E^M</u>	E	E	E	E	E	E
D	D	D#	D	D	D#	D ^{PN}
C	C#	C#	C	C#	C# ^{PN}	C
B	B	B	B	B ^{PN}	B	B ^b
A	A	A	A ^P	A	A	A

The question of modality in Greek music is beyond the scope of this Introduction: it is debatable, for instance, whether the octave species had a modal life of their own, or whether they were, within the central octave, mere redistributions of the Dorian octave itself. Boethius, who follows Ptolemy in limiting his 'modes' to seven, realizes that there was a relationship between 'octave species' and 'mode':

And so out of the octave species of consonance there exist what are called modes, which some also call tropes or tones. However, tropes are systems which differ in highness and lowness of pitch in their entire range.⁶²

⁶²*De inst. mus.* 4,15(341.19-22): 'Ex diapason igitur consonantiae speciebus existunt, qui appellantur modi, quos eosdem tropos vel tonos nominant. Sunt autem tropi constitutiones in vocum ordinibus vel gravitate vel acumine differentes'.

Boethius here provides a pointer to the placement of the species within the central octave, since he draws a contrast, by the significant use of the conjunction 'autem', between the 'tropi', which vary in pitch ('gravitate vel acumine differentes'), and the 'modi', which, by implication, do not. In other words, 'modes' and 'tropes' are not synonymous. On the other hand, Boethius refers to a Greek tradition which regards τόνοι and τρόποι (*toni* and *tropi*) as synonymous, and his 'tropi' represent the transpositions of the complete double diapason system, which he calls 'tota constitutio'.⁶³ He follows Ptolemy in limiting his 'modes' to seven, but his transpositions are more in the tradition of Aristoxenus.⁶⁴

If therefore these total systems are made higher in pitch, or rendered totally lower, the seven modes will be produced according to the octave species mentioned above.... Their order is as follows: if the order of notes is arranged in the diatonic genus from the proslambanomenos to the nete hyperboleon, then herein may lie the hypodorian mode. Therefore, if the pitch of the proslambanomenos is raised by a tone, and the hypate hypaton is stretched by the same distance, and all the other pitches likewise, then the entire system will be higher in pitch than it was before the transposition of a tone. Thus, the whole system, having been raised in pitch, will constitute the hypophrygian mode.⁶⁵

⁶³Calvin Bower (*Bower/Boethius* p. 153) has omitted to translate 'autem' on the grounds that, in Boethius, *modus tonus* and *tropus* may be regarded as synonymous, so that any functional difference between *modus* and *tropus* need not be brought out in translation. For the synonymy of τόνοι and τρόποι see Aristides Quintilianus *op.cit.* 1.6.20 (Barker *op.cit.* p. 408 f.48). 'Tota constitutio' is Boethius' translation of the συστημα τελειον of Ptolemy (*op.cit.* 2.4. and Barker *op.cit.* p. 323).

⁶⁴See above p. 31.

⁶⁵*De inst. mus.* 4,15 (342.9-16): 'Has igitur constitutiones si quis faciat acutiores, vel in gravius remittat secundum supradictas diapason consonantiae species, efficiet modos VII... Horum vero sic ordo procedit. Sit in diatonico genere vocum ordo dispositus a proslambanomeno in neten hyperboleon atque his sit hypodorianus modus. Si quis igitur proslambanomenon in acumen intendat tono hypatenque hypaton eodem tono adtenuat ceterasque omnes tono faciat acutiores, acutior totus ordo proveniet quam fuit priusquam toni susciperet intentionem. Erit igitur tota constitutio acutior effecta hypophrygius modus.' Palisca (*op.cit.* p.40) says that Boethius was describing a series of transpositions of the octave system from proslambanomenos to mese, and that further 'modi' could be created by transposing the octave plus fifth and the double octave systems. This interpretation makes it difficult to explain the relevance of the octave species in the argument.

Boethius claims that Ptolemy added an eighth mode, called the hypermixolydian. Ptolemy himself however, while admitting this as a theoretical possibility, says that this mode is superfluous on the grounds that it has the same intervallic structure as the first. Boethius writes:

Here I explain the addition of the eighth mode - the hypermixolydian. Let the following letters represent the consonance of the bisdiapason:

A B C D E F G H I K L M N O P

It follows that the letters A to H accommodate the consonance of a diapason....therefore we have said that the first octave species extends from the letter A to the letter H...There remain the letters H to P, which are added on to complete the scheme. This then is the eighth mode which was added on at the top by Ptolemy.⁶⁶

⁶⁶*De inst. mus.* 4,17 (347.18-348.3): 'Cur autem octavus modus, qui est hypermixolydius, adiectus sit, hinc patet. Sit bisdiapason consonantia haec:

A B C D E F G H I K L M N O P

Diapason igitur consonantiam servat A ad id quod est H... Primam igitur diximus esse speciem diapason eam, quae est AH....Relinquitur igitur extra HP, quae ut totus ordo impleretur, adiecta est. Atque hic est octavus modus quem Ptolomeus superadnexuit.' For Ptolemy's rejection of the hypermixolydian, see Ptolemy *op.cit.* 2.9.63 (Barker *Greek Musical Writings* p. 334)

The 'modi' of Boethius

							a	A
						g	g	B
					f#			
						f	f	C
				e	e	eb	e	D
			d	d	d	d	d	E
		c#			c#			
			c	c		c	c	F
	b	b		b	b		b	G
			bb			bb		
A	a	a	a	a	a	a	a	H
			g#			g#		
B	g	g		g	g		g	I
		f#	f#		f#	f#		
C	f			f			f	K
D	e	e	e	e	e	e	eb	L
			d#					
E	d	d		d	d	d	d	M
		c#	c#			c#		
F	c			c	c		c	N
G	b	b	b		b	b		O
			bb			bb		
H	a	a	a	a	a	a	a	P
			g#			g#		
I	g	g		g	g		g	
		f#	f#		f#	f#		
K	f			f				
L	e	e	e	e	e			
			d#					
M	d	d		d				
		c#	c#					
N	c							
O	b	b						
P	A							

The modern transcription of Boethius' own diagram (previous page) shows the transpositions of the complete system, and is meant to highlight the intervallic structure of the modes within the central octave by placing larger spaces between notes which form the interval of a whole tone. It also shows the existence of the eighth mode—the hypermixolydian. To this representation the present writer has added Boethius' letter series A to P, which should be taken to represent the system in descending form. By adopting such an interpretation, the octave species, including the eighth mode attributed to Ptolemy, fall naturally into place in accordance with Boethius' description—that the eighth mode lies between the letters H and P. This procedure also clarifies Boethius' thesis that the modes spring from octave species which are contained within the same pitch limits.

The three ninth century anonymous treatises, which Gerbert collectively calls *Alia Musica*, contain in the 'Principal Treatise' a passage crucial in that it seeks to integrate the seven octave species with the eight medieval modes:

From the first octave species will arise the first mode, the deepest of them all; it is called the hypodorian, and its upper limit is that note which is called the mese, in the middle of the string. The second octave species produces the second mode, the hypophrygian, the upper limit of which is the paramese.⁶⁷

This passage shows that the author has adopted Boethius' nomenclature—and it is worth emphasising here that each mode assumed the name of the 'tropus' which brought its corresponding octave species within the central octave.

⁶⁷GS I p. 125 *et seq.* Chailley has shown the treatise to be a composite work made up of the Model Treatise, the Principal Treatise, and the 'New Exposition' and see Jacques Chailley, ed. *Alia Musica* (Publications de l'Institut de Musicologie de l'Université de Paris, no. 6 [Paris: Centre de Documentation Universitaire, 1965]) p. 107: 'Erit ergo primus modus omnium gravissimus hypodorius ex prima specie diapason, et terminatur eo qui mese dicitur, medio nervo. Secundum modum hypophrygium secunda species diapason efficit, quae in paramesen finit.' The problem of the eighth mode, which has the same octave species as the first, is solved by the author of the New Exposition, who assigns to it the D final, in contrast to the hypodorian, the final of which is *a*. (*Ibid.* pp. 198f.).

These modes, like those of Boethius, arise out of the octave species, but they are each projected onto an untransposed double octave system. This means that they must have varying pitch limits. There are here two possibilities: either the anonymous author has made a deliberate move away from the modes of Boethius (and has interpreted them correctly), or he has mistaken the 'tropi' for modes.

If the second supposition is valid, it would undoubtedly have led later writers to misinterpret Boethius. Jacques de Liège writes:

From Boethius..... a trope or a mode is a system which differs in height and depth in its total order of pitches.⁶⁸

It is clear that the Boethian relationship of the modes to the octave species and to the transpositional system is obscured. Modal classification now depends, not only on intervallic structure, but on pitch. Jacques takes the eighth mode to extend from the mese to the nete hyperboleon, so that it becomes the highest mode projected onto the untransposed system, and in accordance with his own perception of Boethius' modes.

The diagram overleaf summarizes the evidence of the medieval theorists as regards their perception of the Boethian modes:

⁶⁸Jacques de Liège *Speculum* 6 p. 36: 'Tropus sive modus, secundum Boetium, est constitutio vocum in totis vocum ordinibus differens acumine ac etiam gravitate.'

Nete hyperboleon	A	A	A	A	A	A	A	A
Paranete hyperboleon	G	G	G	G	G	G	G	G
Trite hyperboleon	F	F	F	F	F	F	F	F
Nete diezeugmenon	E	E	E	E	E	E	E	E
Paranete diezeugmenon	D	D	D	D	D	D	D	D
Trite diezeugmenon	C	C	C	C	C	C	C	C
Paramese	B	B	B	B	B	B	B	B
MESE	A	A	A	A	A	A	A	A
Lichanos meson	G	G	G	G	G	G	G	G
Parhypate meson	F	F	F	F	F	F	F	F
Hypate meson	E	E	E	E	E	E	E	E
Lichanos hypaton	D	D	D	D	D	D	D	D
Parhypate hypaton	C	C	C	C	C	C	C	C
Hypate hypaton	B	B	B	B	B	B	B	B
Proslambanomenos	A	A	A	A	A	A	A	A

JOHANNES' OWN PERCEPTION OF GREEK THEORY

One of the most significant chapters in *Ritus Canendi* shows how Johannes regarded the Boethian 'modes'. He was the first to realize that the passage in *De Musica* which deals with the modes involves the transposition of the double octave system only – the 'tota constitutio' of Boethius, and the $\sigma\upsilon\sigma\tau\eta\mu\alpha$ $\tau\epsilon\lambda\epsilon\iota\omicron\nu$ of Ptolemy.

Johannes' diagram shows eight double octave systems, each one higher than its predecessor and labelled A to *a* so as to emphasise the fact that each one had an identical intervallic structure. The legend surrounding the diagram reads:

These are the Greek tropes or modes, which were also called tones, expressed in Greek characters and made clear by the Latin letters. They are put together by artifice rather than founded in Nature; they differ only in pitch, and appear totally alike. In Boethius, however, different symbols distinguish them, and the measurements of their string lengths were, I believe, absolutely different. Our Latin tropes are certainly created by nature totally unlike one another, though arranged in a single system.⁶⁹

⁶⁹*Ritus Canendi Pars prima* 3.10.12-13: 'Hi tropi modique Graeci, quos et vocavere tonos, expressi Graecis litteris ac declarati Latinis, arte magis compositi quam natura conditi, solis

Despite his perspicacity, Johannes still shows himself to be part of that long medieval tradition which categorically regarded *modus*, *tonus* and *tropus* as synonymous,⁷⁰ and Boethius' *modi* as varying in pitch. It is from this notion that the most serious inconsistency arises within the same chapter of *Ritus Canendi*, for Johannes provides two totally incompatible accounts of what he regards as the 'hypermixolydian trope':

1. It appears, in the form of a double octave, as the eighth transposition of the system;
2. It is mentioned in terms of an octave species, which extends, like that of Jacques de Liège, from the mese to the nete hyperboleon:

Ptolemy, a musician of high stature amongst other musicians, constructed an eighth trope, beginning at the mese and extending to the nete hyperboleon, thereby repeating the first diapason species; to this he assigned the term hypermixolydian.⁷¹

This excerpt occurs in the chapter in which Johannes uses *tropus*, *modus* and *tonus* as interchangeable concepts, and here again there is the failure to understand Boethius aright, and to associate the terminology with the appropriate functions. Johannes is here seen to be loyal to the medieval tradition, which makes his insight into the true nature of Boethius' modes inspirational, but incongruous. Nevertheless, his conclusion is based, not on

locis hic differunt totique parent similes. Quos tamen in Boetio notae diversae variant et mensurae dissimiles erant opinor in omnibus, nam tropi nostri Latini sunt a natura geniti certe toti dissimiles quamquam simul colligati'.

⁷⁰ For the synonymous use of the terms, see for example Jacques de Liège, *Speculum* 6, p. 36, and Marchetto *Lucidarium* 11.1.2. Guido (*Micrologus* 10,2 (p. 133)) accepts that *modus* and *tropus* are interchangeable, but says that to use *tonus* in the same context is incorrect. See also *Ritus Canendi Pars prima* 3.9.2. The debate on the synonymity of these terms in Boethius is in itself a reflection of the confusion inherent in medieval thinking.

⁷¹ *Ritus Canendi Pars prima* 3.10.6: 'Octavum vero Ptolomaeus, grandis inter caeteros musicus, ab ipsa chorda mese in nete hyperboleon extruxit, eandem utputa primam diapason replicando, speciem cui nomen hypermixolydium dedit.' Other theorists mention the addition of an eighth mode, and see Guido *Regulae de arte musicae* in GS 2 pp. 160,164, and F.F. Hammond, ed. Walter Odington *Summa de speculatione musica* (CSM Rome 1970) p. 87. Johannes however is closer to Jacques de Liège, in that he projects the eighth mode within specifically named pitch limits (and see above Note 70).

surmise, but on his understanding of Boethius' 'tota constitutio', and that these modes could only be formed from anything other than the complete system, which contains within itself all the smaller structures:

Now this bisdiapason, structure, in whatever mode, contains within itself the other complete systems.⁷²

Boethius details the distance of each of the transpositions to its predecessor in terms of tones and semitones; each one ascends from its own proslambanomenos with either a tonal or semitonal relationship with its neighbour:⁷³

Hypermixolydian	tone
Mixolydian	semitone
Lydian	tone
Phrygian	tone
Dorian	semitone
Hypolydian	tone
Hypophrygian	tone
Hypodorian	

This order is not detailed in *Ritus Canendi*, though Johannes makes a general statement to the effect that the transpositions are related by either tones or semitones in a similar way to the species:

Each one is always higher than the preceding one by a whole tone or a minor semitone, and they precede and follow each other⁷⁴.

⁷²*Ritus Canendi Pars prima* 3.10.11: 'Quae quidem bisdiapason in quolibet modo totas alias in se....habet constitutiones....'

⁷³*De inst. mus.* 4,15 (341-342).

⁷⁴*Ritus Canendi Pars prima* 3.9.7: '....sicque de singulis subsequentibus in hunc modum ad invicem comparatis quae se semper uno tono superant aut minori semitono....'

However, the legend surrounding Johannes' diagram which details the bisdiapason species suggests that, whereas each species ascends from each successive step of the first species, producing an order of tones and semitones which Johannes claims to be natural, the progression upwards of the proslambanomenos in the case of Boethius' modes or tropes does not observe such an order:

It is in this way that the Greek tropes are related one to another, although the proslambanomenos is there repeated in each trope, and its progression is not natural, as it is here.⁷⁵

The failure to distinguish between Boethius' transpositional *tropi* and the resultant *modi* is also present in Gaffurio's *Theorica musicae* (1492). Here however, the incongruity is even more marked: it is interesting that Gaffurio presents a chart which is similar to that of Johannes in that it portrays eight transpositions of the octave (not the double octave) A to *a*, but his explanation clearly confuses these with the octave species, which he calls 'modes':

The philosophers called these seven species of diapason modes....Now the first species of diapason, going from the string proslambanomenos to the mese....they called the hypodorian. When every step of the hypodorian undergoes a raising of a whole tone, the second mode, that is, the hypophrygian, results.⁷⁶

The full title of *Ritus Canendi* contains the superlative adjective 'vetustissimus', which suggests that Johannes' purpose was merely to provide a comparative account of the tonal systems of Antiquity and the Middle Ages. However, the evidence shows that he was anxious, not only to identify links between the old

⁷⁵*Ibid. Pars prima* 3.8.12: '...hocque ritu tropi Graeci sunt invicem catenati, quamquam proslambanomenos replicetur per singulos, nec sit eius processio, sicut ista, naturalis.'

⁷⁶*Theorica musicae* (Milan: Tonnes Petrus de Lomatino, 1492) V.8 fol. 3kv. Palisca (*Humanism in Italian Renaissance Musical Thought*, Yale, 1985, Chapter XI) provides an extensive account of the growing awareness during the Renaissance of the exact nature of Ptolemy's modes, and their transmission to Boethius. I cannot agree with his comment (*Ibid.* p.295) that Boethius called his transpositions 'modi', and see above, Note 65.

and the new, but to grant to the Greek system the ultimate authority. Clearly influenced by the species classifications of Gaudentios and Boethius, Johannes grants to the three diatessaron species an importance which was not relevant to the Greeks:

The philosophers believed that the entire virtue inherent in the tonal structure lay solely in three species of diatessaron—for whatever lies outside that range is a duplication and a reiteration—and they divided up every such order of pitches by this scheme, connecting together two tetrachords by means of which three varieties of structure are produced.⁷⁷

Though here the immutable tetrachord is overlooked as the nucleus of the system, for Johannes, its value lies in the fact that two such tetrachords placed conjunctly can accommodate the three diatessaron species. It is this emphasis on species which foreshadows his own analysis of the octave species in terms of varying combinations of diatessaron and diapente, and the overriding importance, in his eyes, of such species, not only in modal theory, but also in practice and didactic method. Thus, with Johannes strongly influenced by Boethius, the notion of species becomes the unifying force for the entire treatise.

Further, the evidence shows that Johannes is the first to attempt explanations of the Greek systems. He suggests first a reason for the disjunction of the second and third tetrachords—that, were they not separated by the distance of a whole tone, one of the octave species would be destroyed. As it is, the octave species which extends from the parhypate hypaton to the paramese—B to *b*—is preserved, though it embraces the tritone between the parhypate meson and the paramese. He writes:

⁷⁷*Ritus Canendi Pars prima 1.7.7*: 'Contemplantes namque philosophi solis tribus diatessaron differentiis inesse totam harmoniae virtutem—quicquid enim ultra fit replicatur et unum est—'

In the absence of the proslambanomenos, one of the seven octave species is entirely destroyed; and if you retain it, you produce the dissonance of the interval produced, as I have said, by three successive tones; the worst possible one.⁷⁸

Johannes is right to stress the importance of the octave species in Greek theory, but it is doubtful whether the existence or not of the tritone was of any consequence to the Greeks. Johannes suggests that they were indeed 'disturbed by the dissonance produced by the three tones', but his judgement here is made in the light of the medieval experience.⁷⁹ It is within this context that Johannes comes to explain the reason for the addition of the tetrachord synemmenon, which was joined to the mese to produce the Lesser Perfect System made up of three conjunct tetrachords, with the inevitable introduction of B flat. Johannes argues that the insertion of the B flat destroys the tritone which lies between the parhypate meson and the paramese, and instead produces a true diatessaron:

They placed another extra pitch between the mese and the paramese—that is, the trite synemmenon—the third of the conjunct notes.... Clearly, this cuts and divides into two parts the whole tone which lies between the mese and the paramese, but not into equal halves. The pitch lies at a minor semitone's distance from the mese; consequently, the distance to the parhypate meson is not now three successive tones, but rather a true diatessaron is produced.⁸⁰

⁷⁸*Ritus canendi Pars prima* 1.8.7: 'Alioquin una de septem diapason speciebus tota perit, et si servaveris eam, trium tonorum, ut dixi, discordiam pessimam incurris'.

⁷⁹*Ritus Canendi Pars prima* 1.9.7: '....philosophi trium illorum tonorum discordia concitati.....'. The tritone is mentioned for the first time as a prohibited interval in the tenth century *Musica enchiridis*, and see Hans Schmid, ed. *Musica et scholica enchiridis cum aliquibus tractaculis adiunctis* (Bayerische Akademie der Wissenschaften Veröffentlichungen der Musikhistorischen Kommission volume 3, Munich, 1981) p. 50 (hereafter *Mus. et schol. ench*). It is frowned upon as a melodic interval by Hermannus Contractus (1013-54), and see L.Ellinwood, ed. *Musica Hermann Contracti* (New York, 1936) p. 28.

⁸⁰*Ritus Canendi Pars prima* 1.9.7-8: '....rursus et aliam inter mesen et paramesen constituere chordam triten synemmenon, hoc est, tertiam coniunctarum....Quae procul dubio tonum ab ipsa mese in paramesen secat et dividit, sed non aequaliter, dum ad mesen minus reddit semitonium, et ad parhypate meson per consequens non iam tres tonos successivos, immo veram diatessaron generat'.

However, since the inclusion of the B flat destroys one of the octave species, the Greeks were prepared to tolerate the tritone:

...the philosophers preferred to argue with the tritone all the time rather than be deprived of one of the seven diapason species.⁸¹

But if this is the case, then the tetrachord synemmenon has no purpose:

What is more there to say? Take away the tritone, if you can, and this fifth tetrachord has no validity.⁸²

However, in Johannes' anxiety to support the idea of continuity between Antiquity and the Middle Ages, certain curiosities arise. Whilst on the one hand he seeks to impose medieval thinking onto the Greek systems, and is seen to reject the tetrachord synemmenon, it is an irony that this very feature of the Greek system which had itself become a feature of medieval theory is the one which Johannes chooses to overlook. Hucbald had written of its use with particular reference to the F modes, with the involvement of B flat:

While examples of the tetrachord of the synemmenon are often encountered in all the modes, or tones, they can be seen especially in the authentic and plagal tritus so ubiquitously that in these scarcely any melody is found without a mixture of the tetrachords of the synemmenon and the diezeugmenon.⁸³

It is significant that Johannes makes no mention of the distortion of the Greek system which was implied by Hucbald, and followed by Hermanus Contractus and Berno. The following diagram shows that their tonal system is still based on the conjunct tetrachords separated by a note of disjunction; the difference lies

⁸¹*Ritus canendi Pars prima* 1.8.9: 'Qua de causa, philosophi totis diebus altercari maluere cum tritono quam unam de septem diapason auferre de numero'.

⁸²*Ritus canendi Pars prima* 1.9.14: 'Quid amplius? Tolle, si potes, tritonum, et nil valet istud tetrachordum.'

⁸³*De Harmonica Institutione* in GS I p. 114: 'Cuius tetrachordi exempla cum per omnes modos vel tonos se frequentius offerant, tamen praecipue in autentico triti vel plagis eius ita ubique perspicui possunt, ut vix aliquod melum in eis absque horum permixtione tetrachordorum, synemmenon scilicet et diezeugmenon reperiatur'.

in the fact that the note outside the tetrachordal structure is now at the top, and that the intervallic structure of the tetrachord itself is here changed to that of tone, semitone, tone in ascent: ⁸⁴

A	B	C	D	E	F	G		a	b	c	d	e	f	g	a
			grave			finale			superior excellens						

There is no evidence to prove Johannes' familiarity with this tonal scheme, but what can positively be identified in *Ritus Canendi* is that gamut which is peculiar to *Musica enchiriadis*:⁸⁵

G	A	B ^b	C	D	E	F	G		a	b	c	d	e	f [#]	g	a	b	c
graves			finales				superiores			excellentes								

There is clearly no link here with the thinking behind the Greek system, for the gamut is made up of disjunct tetrachords, and rejects the notion of conjunction which Hucbald inherited. There is a departure too from the diatonicism to which Johannes remains loyal. Johannes wrongly relates this gamut to the Greek diatonic system, both in its number of pitches and in its intervallic structure:

Instead of these terms, our early fathers made use of the following fifteen signs in the early church, and divided the whole gamut into deep, final, superior and excellent notes, while preserving the ancient Greek usage entirely in the order of tones and semitones.⁸⁶

Thus, despite the significance of the Greek system in medieval theory, rejection, omission and error are seen to characterise Johannes' perception of its

⁸⁴Hucbald in GS I p. 119; Hermannus Contractus in L.Ellinwood, *op.cit.* p. 27; Berno *Prologus in tonario* in GS 2 p. 63.

⁸⁵See below, Note 86.

⁸⁶*Ritus Canendi Pars secunda* 1 Preface 11: 'Loco quorum utique nostri patres his quindecim usi sunt in ecclesia primitiva notulis, dividendo totum in graves, finales, superiores et excellentes, ac ritum pristinum Graecum in tonis et semitoniis omnino servantes.' For the gamut, and the Daseian notation which Johannes quotes, see *Mus. et schol. ench.* p. 5.

role. It will be seen that, as a result, his approach to modal theory can be regarded as isolationist, as he cannot relate to the notion of modal affinity which is a classic feature of the theory.

CHAPTER THREE

MEDIEVAL MODAL THEORY

Hucbald's ninth century adaptation of the tetrachordal structure of Boethius' double octave system (including the tetrachord synemmenon) means that the finals of each authentic/plagal pair of modes are accommodated within the single 'tetrachord of the finals', D E F G:

A B C D E F G a b c d e f g a^a

Hucbald writes:

Passing over the first three notes, the next four, namely the lichanos hypaton (D), the hypate meson (E), the parhypate meson (F), and the lichanos meson (G) are used in constructing the four modes or tropes. These are nowadays called "tones", and are the protus, deuterus, tritus, and tetrardus. This is done in such a way that each of these four notes reigns over a pair of tropes subject to it, namely a principal one, which is called the "authentic", and a collateral one, which is called the "plagal". Thus the lichanos hypaton (D) rules over the authentic protus and its plagal, that is the first and second modes; the hypate meson (E) over the authentic deuterus and its plagal, that is, the third and fourth; the parhypate meson (F) over the authentic tritus and its plagal, that is, the fifth and sixth; the lichanos meson (G) over the authentic tetrardus and its plagal, that is, the seventh and eighth.¹

¹Hucbald, *De Harmonica Institutione* in GS I p. 119: 'Quatuor a primis tribus, id est lichanos hypaton, hypate meson, parhypate meson, lichanos meson, quatuor modis vel tropis quos nunc tonos dicunt, hoc est protus, deuterus, tritus, tetrardus, perficiendis aptantur; ita ut singulae earum quatuor chordarum geminos sibi regant subiectos, principalem, qui autentus, et lateralem, qui plagius appellatur: lichanos hypaton scilicet autentum protum et plagium eiusdem, id est, primum et secundum; hypate meson autentum deuterum et plagium eius, id est, tertium et quartum; parhypate meson autentum tritum et plagium eius, id est, quintum et sextum; lichanos meson autentum tetrardum et plagium eius, id est, septimum et octavum'.

Hucbald is the first to state that there is a modal affinity between the pitches of the finals tetrachord and those of the one above:

...the notes above each of these four finals respectively are joined with them in such a bond of similarity that one will generally find that melodies can close on these notes a fifth above without offending anyone's judgement or ear. They remain entirely within the same mode or trope, as though according to some principle.²

Despite its characteristic chromaticisms, the central portion of the *Musica enchiriadis* gamut is diatonic, and, like the corresponding segment of Hucbald's system, divides itself into two disjunct tetrachords:

a b c
F A B \flat C D E F G a b c d e f \sharp g a b c

The author says that if a melody of limited range—'Tu sempiternus es filius'—which has D as its final, is transposed to the upper fifth, then that melody retains its modal identity:

....if you make it higher by three spaces, the fourth mode arises. If it is carried one space higher, it will be the first (mode) again in the fifth position.³

Modal affinity was described again in the eleventh century by Guido d'Arezzo:

If it is the kind of melodic segment that, going up after D E F, wants two tones and a semitone—which causes B flat, or going down after D E F, wants

²*Ibid.* '....quinta semper loca his quatuor superiora quadam sibi connexionis unione iunguntur adeo ut pleraque etiam in eis quasi regulariter mela inveniantur desinere, nec rationi ob hoc vel sensui id contraire, et sub eodem modo vel tropo recte decurrere'. The English translations are by Babb in Palisca, ed. *Hucbald Guido and John on Music* pp. 38-39.

³*Mus. et schol. ench.* 3 p. 7: 'Si tribus, modus nascitur quartus. Si adhuc uno altius spacio efferatur, erit quinta denuo regione primus'.

two whole tones, then instead of D E F use *a b c*, which are of the same mode, and regularly have the previously mentioned descents and ascents.⁴

A total acceptance of the theory of affinities however was not a view that was universally held: the author of the fourteenth century *Quatuor Principalia* writes:

It should be noted that the plagal protus, deuterus and tritus modes sometimes place their finals on *a b* or *c*, contrary to established practice. This is because they are transposed to the upper fifth....Because it is a rare occurrence, it is not a rule, but a misuse. These three letters are called collateral.⁵

Marchetto da Padua, also writing in the fourteenth century, points out that sometimes melodies need to end on what he calls their 'co-finals', pitches which lie a fifth above their respective finals. Such melodies he regards as irregular:

But... if it cannot be ended on its final, then it ought to be ended on its co-final—and then the mode is said to be irregular because, on account of some anomaly that lies in it, or may lie in it, it does not proceed according to its proper rule...⁶

This brief summary of the theory, with extracts drawn from early and later writers, provides the context in which to discuss Johannes' distinctive approach to chants which have their 'finals' on *a b* or *c*; such chants, he says, lie outside the eight authentic/plagal structures, but should not be classified as irregular:

⁴Guido *Micrologus* 8,19-21 (pp. 125-126): 'aut si talis est neuma, quae post D.E.F. in elevatione vult duos tonos et semitonium, quod ipsa facit, aut post D.E.F. in depositione vult duos tonos, pro D.E.F. assume *a b c*, quae eiusdem sunt modi et praedictas depositiones et elevationes regulariter habent.'

⁵CS 4 p. 233: 'Notandum quod plagales prothi, deuteri et triti, quia ad quintas voces elevantur, aliquando contra auctoritatem in *a b c* acutis finem ponunt, ut patebit inferius; sed quia raro accidit, non regula, sed abusio est. Istaes tres litterae collaterales vocantur'.

⁶Marchetto *Lucidarium* 11.4.30: 'Si autem...in finali finiri non potest, debet in confinali, et tunc talis tonus irregularis dicitur, eo quod propter accidens quod in eo est, vel esse potest, secundum sibi datam regulam propriam non incedit....'

And so melodies of this type should not be classified by anyone under the above eight tones, and in no way should they be called irregular; rather they should be said to have their finals on *a* *b* or *c*.⁷

There is veiled criticism here of later writers, very probably of Marchetto.

Johannes' familiarity with Guido's *Micrologus*, and his own chapter which deals with 'melodies which have their finals on *a* *b* or *c*', would suggest that he had at least read of, if not assimilated, Guido's affinities at the upper fifth.⁸

However, there can be little doubt that Johannes' reference is to do with the theory of affinities. In connection with those chants which have their 'final' specifically on *a*, he draws a contrast between early and later writers:

....we must look at the three *differentiae* of antiphons in use which have their final on high *a*. Some would wish to regard these as irregular, but nowhere have we found this to be the case in the eyes of the early musicians of Christ's Church, or of men of great eloquence.⁹

Two observations can be made: first, by overlooking the tetrachordal structure of Hucbald's gamut, and misinterpreting that contained in *Musica enchiridis*, Johannes cannot relate to the theory, the foundation of which is that when melodies close on the upper fifth, they can remain in the same mode. As far as Johannes is concerned, such chants lie outside the modal system. Secondly, his examples of chants which have their final on *a* do not relate to transposition to the upper fifth, but to those classified as being in the fourth mode, with their final on *e*, but transposed to the upper fourth so as to close on *a*.

⁷*Ritus Canendi Pars secunda* 1.7.10: 'Non ergo sunt huiusmodi cantus ab aliquo de suprascriptis octo tonis denominandi, nec irregulares quoquomodo reputandi, quin potius in *a* finiti dicendi sunt aut in *b* vel in *c*'.

⁸*Ritus Canendi Pars secunda* 1.7.

⁹*Ibid. Pars secunda* 1.11.2: '...videndae sunt antiphonarum in *a* acuto finientium usitatae tres differentiae, quas quidam irregulares esse voluerunt, quod nusquam apud veteres Ecclesiae Christi musicos et eloquentiae multae viros invenimus'.

Of these he cites 'Benedicta tu', 'Sicut murrha', 'Dominus regit me' and 'Factus sum'.¹⁰ All four antiphons belong to Gavaert's *Theme 29*, the melodic prototype which, in its untransposed form, contains both F natural and F sharp. It is this chromatic alteration which makes the transposition necessary—a problem which Berno of Reichenau had identified in the eleventh century: the problem of notating the F sharps in the untransposed version is eradicated if such chants are transposed to the upper fourth so that an F sharp becomes a B natural, and an F natural a B flat:

So that this matter can be made even clearer, let us take the following antiphons in the fourth tone as examples: 'Factus sum', 'O mors ego', 'Sion renovabit', 'Sion noli timere' and 'Vade iam'. If you wish to begin these antiphons on the third note above the final, that is, the lichanos meson (G), the melody will not be correct, since you will not find the semitone where it should be. But if you begin a fourth above, that is, at the mese *a*, interpose a semitone in the synemmenon tetrachord, and then a tone, and begin these chants on the third note, namely the paranete synemmenon (*c*), then you will see that the melody will proceed without harm to itself until it arrives at the mese, and with the mese as its final, it is compatible with the actual final.¹¹

The Antiphon 'Factus sum' is cited by both Berno and Johannes as a chant which has its transposed final on *a*. Both transposed and untransposed versions appear on the single stave, and identify the chromaticism of which Berno speaks:

(musical example overleaf)

¹⁰The first three antiphons are cited at *Ibid. Pars secunda* 1.7.7., and 'Factus sum' at *Ibid. Pars secunda* 1.11.7.

¹¹*Prologus ad tonarium* in GS 2 p. 75: 'Ut enim hoc clarius elucescat, ex quarto tono ponamus haec sub exemplo. Ant. factus sum. Ant. o mors ego. Ant. Sion renovab. Ant. Sion noli timere. Ant. Vade iam. Si has antiphonas tertio a finali loco, id est, a lichanos meson, incipere volueris, in modulando deficis, dum semitonium, ubi esse debuit, minime reperis. Sin autem quartum locum, id est mese, attendas, ac interposito primum semitono in synemmenon, deinde tono, sicque tertio loco, hoc est, paranete synemmenon, eadem inchoaveris, totam cantilenam absque sui laesione videbis decurrere, donec ad finalis sui comparem, id est, mese eam contingat in fine pervenire'. For Theme 29, see Gavaert, *La melopée antique dans le chant de l'église latine* (Osnabruck, 1895; repr. Otto Zeller, 1967) p. 322.



THE OCTAVE SPECIES USED TO EXPLAIN 'IRREGULAR' CHANTS

That aspect of medieval theory which formally portrays the scalar structure of the modes as conjunctions of the diatessaron and the diapente was developed by Berno of Reichenau.¹² Later writers discussed the topic in a similar way, but Marchetto da Padua is the first to grant the octave species any weight; he would, he says, 'condemn those who would judge a melody merely on the basis of its ascent and descent, with respect to its final, but without any regard for its species.'¹³

This emphasis lies at the heart of Johannes' perception of the modes, and provides the foundation of his argument for establishing finals on *a*, *b* or *c* for those chants which 'lie outside the system'.¹⁴ The fourth diapason species can accommodate two of the eight modes—the first (authentic protus), and the eighth (plagal tetrardus):

Mode 1 D E F G a b c d

4th diapason species

Mode 8 D E F G a b c d

It is clear then that the other six diapason species have the same capacity:

* A B C D E F g a

1st diapason species

Mode 2 A B C D E F g a

¹²See the *Prologus in tonario* in GS 2 p. 67, following an abstract from an earlier writer in GS 1 p. 313.

¹³Marchetto *Lucidarium* 11.3.2: 'Sunt nonnulli qui absque specierum lege cantus diiudicant cuius toni sint solum ascensum et descensum inspecto fine, quorum iudicium pluribus rationibus nullum est'.

¹⁴*Ritus Canendi Pars secunda* 1.7.10.

*	B	C	D	E	F	g	a	b	
									2nd diapason species
Mode 4	B	C	D	<i>E</i>	F	g	a	b	
*	C	D	E	F	g	a	b	c	
									3rd diapason species
Mode 6	C	D	E	<i>F</i>	g	a	b	c	
Mode 3	<i>E</i>	F	G	a	b	c	d	e	
									5th diapason species
*	E	F	G	<i>a</i>	b	c	d	e	
Mode 5	<i>F</i>	G	a	b	c	d	e	f	
									6th diapason species
*	F	G	a	<i>b</i>	c	d	e	f	
Mode 7	<i>G</i>	A	B	C	D	E	F	g	
									7th diapason species
*	G	A	B	<i>C</i>	D	E	F	g	

[Italicised letters identify the finals]

The three plagal structures which are formed from the fifth, sixth and seventh diapason species enable Johannes to establish 'respective finals on *a* **b** or *c*', and to classify chants in this innovative, if not startling, way.¹⁵ Clearly, there is no suggestion here either of affinity or of transposition, concepts which are themselves classic features of modal theory. Johannes is even able to reject the notion that chants which close on *a* should be in the fourth mode, for, he argues, these chants are accommodated within the fifth diapason species, not the second, which is the

¹⁵*Ritus Canendi Pars secunda* 1.7.5: 'Plani cantus itaque quos in *a* finitos acuto vides aut in **b** aut in *c*, nihil aliud agunt nisi quod sicut octavus tonus quartam diapason speciem, sic et isti quintam sextam et septimam per diatessaron et diapente dividunt...' It is worth recalling that, in the plagal modes, the diatessaron is placed below the final; in the authentic forms, this species appears above.

domain of the fourth mode.¹⁶ Ironically, Johannes also rejects the use of B flat in this category, for then 'they become like the fourth tone'—to which tradition has assigned them in any case.¹⁷ Here he argues that when the fifth diapason species replaces a B natural with a B flat, it has an identical intervallic structure to the second species. Such a preoccupation with species results in Johannes' disregard of the chromatic alteration which is the hallmark of these chants.

With reference to the same chants, Burtius questions why anyone should regard them as irregular, and concludes that they can justifiably be classified as being in the fourth mode on account of their characteristic diatessaron species E F G *a* (the transposed species B C D E which is a constituent of the mode):

For while these antiphons....are plagals, yet with respect to the diatessaron which they have, they are reckoned sequentially from the fourth (mode) rather than from any other....¹⁸

But a different opinion exists:

....nevertheless, a few ventured to call these modes "commixed", that is, put together as much out of their proper species of diatessaron and diapente as out of ones belonging to others.¹⁹

This is a possible reference to what appears to be Johannes' sole concession to the notion of affinity, in that he aligns antiphons which close on *a* with psalms intoned

¹⁶*Ritus canendi Pars secunda* 1.7.8: 'Quartus namque tonus....*secundam* per diatessaron ac diapente distinguit *diapason speciem, hi autem cantus quintam*....' (my italics).

¹⁷*Ritus canendi Pars secunda* 1.11.4: 'Nec est ullatenus in his antiphonis per b molle sine tritono cantandum, *ut scilicet quarto tono fiant similes*...' (my italics).

¹⁸*Nicolai Burzio Musices Opusculum* (Bibliotheca Musica Boloniensis, ser. 2 no.4 (facsimile of 1497 Bologna edition, Bologna, 1969) d v: 'Nam cum istae antiphonae....sint plagales: sunt respectu diatessaron quam habent desuper reputantur de quarto potius quam de alio tono....'

¹⁹*Ibid*: d.vi: '....tamen nonnulli ausi eos appellare commixtos, id est tam ex suis propriis diatessaron et diapente speciebus quam ex alienis compactos'.

in the fourth tone.²⁰ However, a little later, he does regard such relationships as 'commixed':

And so....let not this intermingling of all the plainsong melodies confuse you; let an examination of the truth, together with the species of consonance, be your master. For all melodies are mingled, with few, or no exceptions....²¹

Dolores Pesce suggests that Burtius' comment refers to Marchetto's *toni commixti*, but it is more likely that Marchetto himself would have regarded such chants as being in an 'acquired' mode (*acquisitus*):

Such a mode is said to be "acquired", because its species are acquired through variation of the signs of the round and the square b , and, contrary to proper procedure, they are ended on a location other than the proper final or cofinal.²²

ASPECTS OF MODAL THEORY IN LUCIDARIUM

That Marchetto bestowed an authority on the diapason species has already been mentioned, but other aspects of his modal theory were to influence Johannes' thinking. Marchetto himself had proposed four categories of mode, based solely upon considerations of melodic range—perfect, imperfect, pluperfect and mixed. Marchetto regards as perfect that mode which 'fills its measure—to ascend a

²⁰*Ritus Canendi Pars secunda* 1.7.11: '...et quartus tonus ab antiquis in *a* finitis antiphonis psalmodum inchoationes....'

²¹*Ibid Pars secunda* 1.7.12: 'Non te decipiat ergo lector omnium planorum commixtio cantuum, sed te regat inspectio veritatis et species consonantiarum; omnes enim paucis aut nullis exceptis commixti sunt....' See below pp. 57–60 for discussion of Marchetto's 'commixture of species'.

²²Marchetto *Lucidarium* 11.4.48: 'et talis tonus dicitur acquisitus, eo quod acquiruntur eius species per variationem signorum rotundi et quadri, et in alio loco que (*sic*) improprie terminantur'. The reference is to such chants as the third mode Communion 'Beatus servus' which closes on *a*, not *e*. This *a* final does not classify as one of Marchetto's cofinals, which are consistently a fifth above the proper finals. Dolores Pesce's authoritative and intensive study *The Affinities and Medieval Transposition* (Indiana, 1987) has been an invaluable source for this aspect of modal theory, and all translations of passages which deal with this topic are by her. For her comment on *toni commixti*, see *Ibid.* p. 106.

diapason above its final and to descend a whole tone below that final'.²³ This definition applies only to the authentic modes, while for plagal structures, perfection exists when they rise from their final to the upper sixth, and descend from their final to a fourth below.²⁴ Imperfection involves a failure to embrace such an ambitus, and for a mode to be pluperfect, it would need to exceed the range of the diapason—which is perfection.²⁵ The notion of 'mixed' modes is not present in *Ritus Canendi*, but Johannes does relate the imperfect and pluperfect modes to a perfection which has a wider range—the species of diapason plus diatessaron:

These four ancient tropes were able to have one tetrachord—that is, four pitches, beneath the final and a complete diapason above the final; they were then referred to as 'perfect'. If a smaller range was involved, they were 'imperfect', and if more pitches were involved, they were 'more than perfect'.²⁶

Johannes' observations on the first mode Introit 'Rorate caeli' provide us with an insight into the extent not only of his indebtedness to Marchetto, but also of his understanding of him. In accordance with the octave species theory, Johannes says that the chant should be sung with a B natural, and should contain no B flats, 'lest

²³Marchetto *op.cit.* 11.2.22: 'Implere enim modum suum in auctenticis est a suo fine ad dyapason ascendere et non ultra, et ab eodem fine descendere unum tonum...'

²⁴*Ibid.* 11.2.25: 'Implere autem modum suum in plagalibus est a fine suo ad sextam ascendere et ab eodem fine quartam descendere et non ultra'.

²⁵*Ibid.* 11.2.26: 'Tonus vero imperfectus dicitur ille qui non implet modum suum...'. For pluperfect modes see *Ibid.* 11.2.27-28: 'Tonus plusquamperfectus auctenticus dicitur ille qui ultra dyapason a suo fine ascendit, scilicet ad nonam vel ad decimam; plusquamperfectus vero plagalis dicitur ille qui infra quartam a suo fine descendit'.

²⁶*Ritus Canendi Pars secunda* 1.4.4: 'Hi quatuor antiqui tropi tetrachordum unum, hoc est, quatuor sub suo fine vuculas, habere poterant, et unum desuper diapason integrum, tuncque perfecti, si vero minus haberent, imperfecti, et si plus aliquas vuculas, plusquam perfecti.' Harlinger (*Lucidarium* p.11) has identified several writers who have been influenced by the theory. Suffice it here to quote Burtius, who follows his teacher's notion of perfection, and see *Florum Libellus* p. 98: 'Poterant igitur tropi praenominati sub suo fine tetrachordum in quattuor vuculas habere et desuper diapason integrum tuncque *perfecti*. Qui et si tali mensura deficientes et mutilati, *imperfecti*. Si vero aliquantulum plus hos terminos transcenderent*plusquam perfecti* auctoritate Johannis Carthusiensis et ceterorum vocitabantur.' (my italics).

the character of the constituent species be destroyed.²⁷ Though Marchetto does not cite this Introit, a study of its range shows it to be an example of that perfection of which he speaks—a perfection brought about by its ability to accommodate the proper representation of the first species of diapente and of diatessaron. Thus in both writers, the authority of the species is not questioned, though the idea of perfection, based upon the octave, is necessarily absent from Johannes' account.

Of further interest is Johannes' adoption of Marchetto's innovative term 'commixtus'—coined by the latter to describe those occasions when a species of fourth or fifth other than those species which normally constitute the mode of a melody, is introduced into that melody. The basis of the *Lucidarium* theory involves the species of fifth which is common to each authentic/plagal pair, and also the 'common' or 'proper' species of fourth:

<u>D E F G</u> proper fourth	<u>a b c d</u> common fourth	Authentic Protus Mode I
common fourth <u>A B C D</u> E F G a <div style="text-align: center; margin-top: 5px;">  </div>		Plagal Protus Mode 2

Marchetto was thus able to devise, for illustration, commixtures of the common species of fifth in the first mode with species common or proper to the other modes, with the exception of the second and eighth modes—the former shares with the first mode a common final, and the latter the same octave species.²⁸

²⁷*Ritus Canendi Pars secunda* 1.8.12: 'Non igitur cantari debet Rorate caeli desuper'...per b rotundum...*ne mutatis speciebus propriis totus cantus immutatus appareat...*' (my italics). Johannes identifies these systems with what he regards as the four early modes, which were at a later stage divided into authentic and plagal forms. Both Guido (*Micrologus* 12 (p. 147)) and Marchetto (*Lucidarium* 11.2.2.) relate to this tradition. Other writers assign a specifically Greek origin to the four 'older' modes: the author of *Treatise I* in Oliver B. Ellsworth, ed. *The Berkeley Manuscript* (University of Nebraska, 1984) p. 69; John of Garland in *Introductio musicae* (CS I p. 168); the author of *Tractatus musica plana* also mentions the plagal forms as being later developments. (CS 2 p. 345).

²⁸Marchetto *Lucidarium* 11.4.227-228.

Lionel Powers has observed that the practical applications of the notion of commixture are rare; he mentions that Marchetto had identified an initial E in a first mode chant as producing commixture:

A melody in the first mode may be begun on low E, but rarely and in mingled form, like the Responsory 'Annuntiatum est per Gabrielem'.²⁹

Ugolino of Orvieto (c.1430) had also identified a number of chants in the first mode which he regarded as commixed on the grounds that they do not achieve perfection on account of their range:

But in this first authentic mode we identify another diapason not pertinent to it, namely from the first C to the second, as is demonstrated in some Responsories, Introits, and so on....in all of these we find a diapason which we call 'not pertinent' to them. Therefore this trope does not qualify to be called perfect for this reason—that the diapason from C to c is not pertinent to it. The mode is called commixed for the reason given above.³⁰

It is difficult to reconcile Johannes' claim that 'all melodies are mingled' with the dearth of examples which Marchetto and Ugolino feel they are able to cite.³¹ On the other hand, Johannes may have been led to adopt this view, given the nature of the examples themselves. Certainly in the case of 'Rorate caeli', Johannes observes that the low C—with which the chant begins—is the first note of the C to c octave, which is the third species of diapason, and not allied with the first mode. But since

²⁹*Ibid.* 11.4.81-82: 'In E gravi, et hoc commixte et raro, ut Responsorium Annuntiatum est per Gabrielem. Commixte dicimus, quia tale principium principaliter tercio et quarto competit tonis.' And see Lionel Powers *Mode* in *The New Grove Dictionary* Vol. 12 p. 394.

³⁰Albert Seay, ed. *Ugolini Urbevetanis Declaratio Musicae Disciplinae* in CSM 3 (Rome, 1959) I p. 186 (hereafter *Ugolino Declaratio*): 'Sed huic protho autentico primo aliud diapason eidem pertinens sic comprehendimus esse commixtum, scilicet, a C primo ad C secundum, ut patet in responsoriis introitibus et cetera....His in omnibus dictum impertinens diapason penitus invenitur....Non igitur huius ratione impertinentis diapason a C ad C hic tropus perfectus nuncupari, sed illius ratione commixtus.' Seay's reading 'eidem pertinens' should probably read 'ei impertinens.'

³¹See Note 21 above.

this chant, through its range, is able to achieve perfection, commixture cannot be said to prevail, at least in Ugolino's terms. In the same chant, Johannes identifies two occurrences of the third diatessaron species, one in ascent, the other in descent, and 'four or five' instances of the third diapente species, of which it is possible to identify only three:³²

The third diatessaron species—*G a b c*—is that which is proper to the tetrardus (seventh and eighth) modes, but it cannot be said to contribute to true commixture since the first and eighth modes share the same diapason species. If one is to continue to speak in terms of Marchetto's theory, the third diapente species is that which is common in the tritus (fifth and sixth) modes. Johannes particularly refers to the single occurrence of this species in its descending form, which contains a tritone:

You also have in this melody four or five occurrences of the third diapente species—from low *F* to high *c*, and, on the other hand, one instance of a tritone.³³

However, in speaking of the fifth mode, Marchetto says that, in descent, the round *b* should be used to avoid the tritone, a factor which Johannes cannot countenance, since he has already rejected this pitch in 'Rorate caeli'. Again, for there to be true commixture, the inclusion of the round *b* would have to be a necessary feature. Marchetto identifies further instances for the use of the round *b*, based upon his notion of perfection, and on the avoidance of the tritone. He writes:

³²*Ritus Canendi Pars secunda* 1.8.9-10.

³³*Ritus Canendi Pars secunda* 1.8.9: '...habes etiam ibi quater aut quinquens tertiam diapente speciem ab *F* gravi in *c* acutum, et e diverso tritonum quoque semel...'

1. If the first mode is imperfect, that is, when it rises to high b and no further, it should always be sung to round b, and it is then that it is mingled with the sixth mode.³⁴
2. The second mode should always be sung with a round b since it can only rise a sixth above the final.³⁵
3. The third mode should properly be sung with square b .³⁶
4. The fourth mode should normally be sung with square b , but there are instances where the round b should apply.³⁷
5. The fifth mode should be sung with the round b in descent.³⁸ When the fifth mode wants to ascend to its perfection, it does not find the harshness of the tritone if the square b is used.³⁹

(This last rule contrasts with Johannes' insistence on the round b, both in ascent and descent. He is in no position to apply any rule which is based upon perfection, since his own notion of it is based, not on the octave, but the octave plus fourth).

Several other important aspects of Marchetto's theory are also absent from Johannes' discourse:

1. *Intermediation*: the way a species is intermediated (based upon considerations of the number of pitches involved) helps to determine the mode;⁴⁰
2. The designation of species according to function - whether 'initial' ('principalis') or 'terminal' ('terminalis');⁴¹

³⁴Marchetto *Lucidarium* 11.4.11: 'quia ut ascendit ultra primam suam speciem dyapente ad b acutum et non ulterius, et tunc semper per b rotundum debet modulari, et cum sexto dicitur esse commixtus....'

³⁵*Ibid.* 11.4.94: 'Debet namque cantari secundus tonus semper per b rotundum'.

³⁶*Ibid.* 11.4.109: 'Debet namque cantari tercius tonus semper proprie per b quadrum'.

³⁷*Ibid.* 11.4.127: 'ideo dicimus, ad dictam duriciam evitandam, quod tales cantus cantari debeant per b rotundum....'

³⁸*Ibid.* 11.4.147: 'Cantari debet etiam per b rotundum suo scilicet in descensu....'

³⁹*Ibid.* 11.4.146: '...ut cum vellet quintus ad perfectionem ascendere non inveniatur tritoni duricia....' For Johannes' insistence, see *Ritus Canendi Pars secunda* 1.8.23: 'Hic cantus de quinto tono: quotiens vides tritonum, tam ascendens quam descendens, canitur per b rotundum'. For his 'perfection', see Note 26 above.

⁴⁰*Ibid.* 11.4.231-50

⁴¹*Ibid.* 11.4.215-216

3. Terminology which relates to various melodic shapes within the species—'simplex', 'composita', 'aggregata', 'disregata', 'apposita', 'supposita' and 'continua'.⁴²

Herlinger describes as 'original and ingenious' Marchetto's solution to the problem of classifying problematic chants by the application of rules which are comprehensive enough to accommodate every contingency.⁴³ It is impractical and unrealistic to take the view that such rules would have been imposed on the chant so as to change its nature; rather they would have to reflect the true practice both of the composer and the singer. It follows that the more Johannes is seen to reject Marchetto (for example, in the application of the square and round b's in the fourth and fifth modes), the more divorced from reality he is bound to become. Certainly, his preoccupation with the diatonic Greek system, its imposition onto the medieval system, and the ultimate authority of the species, without regard for their function according to placement, would tend to obscure questions of modality rather than clarify them.

⁴²*Ibid.* 11.4.219-226

⁴³*Ibid* p.7.

CHAPTER FOUR

THEORY AND PRACTICE

THE MONOCHORD

Since Antiquity, the single string monochord has provided audible proof of the relationship of musical interval to mathematical ratio, and theory and practice are thus allied.¹

The nature of the instrument which Johannes describes is clear from his text:

This is so, not because this instrument has only one string, but because whatever usually happens on several strings will happen entirely on one string, as long as the keys do not clash by striking each other. This instrument therefore has various ranks of strings, and the strings are tuned in pairs; this is not so that more notes are sounded, but because a double string has a richer sound than a single one, and if all the keys were to strike a single string, it would be impossible for one not to get in the way of the other frequently.²

There is a pointer here to the fact that the instrument portrayed is a type of early clavichord, for it possesses several ranks of strings which are tuned in pairs; these are struck by the tangents of several keys, but at different locations, a fact which determines the individual pitches. The fact that Johannes refers to such an instrument as a 'monochord' is not incompatible with other theoretical accounts which date from the fifteenth and sixteenth centuries.³

¹See Introduction pp. 19–23

²*Ritus Canendi Pars prima* 2.6.4-5: '...non quod solam chordam habeat istud instrumentum, sed quia quicquid in multis solet fieri chordis, si se feriendo non impugnent claviculae, totum in una fiet. Habet igitur istud instrumentum varios chordarum ordines, binas atque binas intendentes chordas, non tamen ut soni sint numero plures, sed quia chorda duplex virilius quam simplex resonat, unum et idem et si solam omnes chordam ferirent claviculae, quod una saepius non impediret alteram foret impossibile'.

³See Edwin Ripin's article *Clavichord* in *The New Grove Dictionary* vol. 4 p. 459. Mark Lindley (Royal Musical Association Research Chronicle 16 (1980) p. 9) takes the view that Johannes' instrument had 'only one string or pair of strings'; if the instrument is indeed single-stringed, the phrases 'binas atque binas...' and 'varios chordarum ordines' become impossible to explain. Conversely, it has been known for commentators to mistake the single stringed instrument for one which can accommodate several strings, an error attributable to the dual meaning of *chorda*, which can denote either *string* or *individual pitch*. Thus Wantzlöben (*Das*

In such early clavichords too, the strings were all of the same length, and were tuned in unison, as Johannes attests:

It is all one and the same, whether the string is tightened or not, on the monochord, for just as the string, when divided into its constituent parts does not vary whether it is tight or slack...⁴

The positions of the major and minor semitones in relation to a black key also connect the monochord of Johannes with the early clavichord:

However, the minor semitone needs to be the first—that is, it should occupy the position towards the left hand side; conversely, the major semitone should be placed to the right.⁵

Tuning

The pitch was determined by the length of that section of the string which was left to vibrate; the most common medieval system of monochord division was based on the tuning of the whole string to the Greek *gamma*, dividing the string into ninths, and the placing of A at the first division, thus producing the sesquioctave ratio between A and gamma, which is that ratio allied with the whole tone. Johannes however, like Ugolino of Orvieto, follows Boethius in discarding the gamma, and beginning at the proslambanomenos A, and establishing B, the hypate hypaton, at the first of the nine divisions:⁶

Monochord als Instrument und als System (Halle, 1911 p. 164) endows Johannes de Muris' instrument with nineteen strings, whereas it is more reasonable to argue that the latter is describing the division of the string into nineteen segments. Wanzlöben's comments are identified by Walter Nef in *The Polychord* (Galpin Society Journal 4 (1951) p. 21.

⁴*Ritus Canendi Pars prima* 2.6.7: 'Monochordum autem sive tetenderit chordam sive laxaverit unum est et idem...'. For Ramos de Pareia's similar observation, see *Musica practica* p. 15: 'Etenim chordae monochordi quae eiusdem sunt grossitiei, longitudinis et extensionis..... eundem necessario sonum emittent...'.

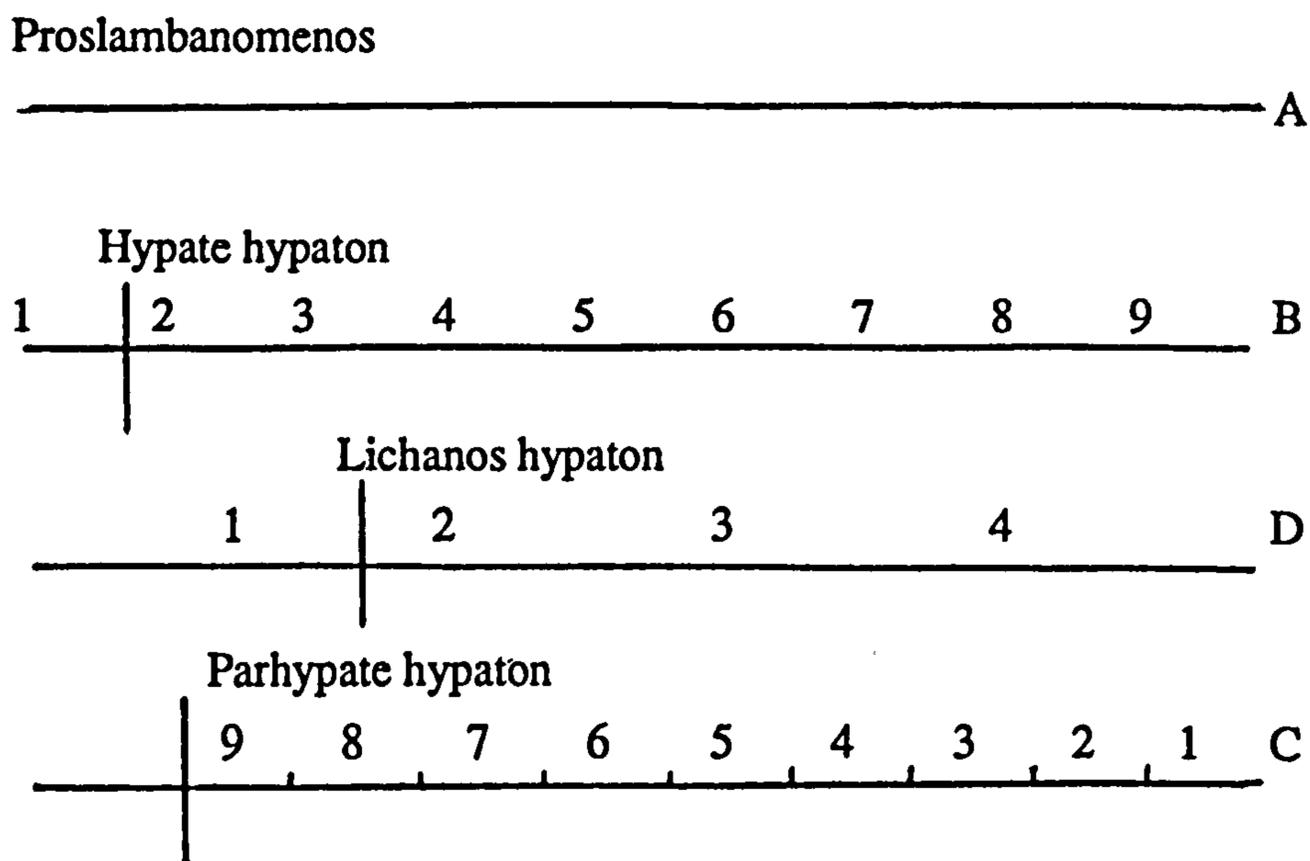
⁵*Ritus Canendi Pars prima* 2.10.11: 'Attamen necesse est minus praecedat, hoc est, versus manum sinistram locum occupet, maius autem versus dexteram de contra mansionem habeat...'. See also Burtius *Florum Libellus* p. 35: 'tonum in duo inaequalia partiri necessarium ostendimus....minus semper praecedit semitonium et non aliter'.

⁶*De inst. mus.* 4,5 (315) and Ugolino *Declaratio*, p. 234.

On the basis of the sesquiterial ratio (4:3), the Lichanos hypaton (D) is established as a diatessaron above the proslambanomenos by dividing the whole string into four segments. The Parhypate hypaton (C) is established as a whole tone below the Lichanos hypaton in the sesquioctave ratio. Thus the minor semitone between B and C establishes itself as the difference between the ditone and the diatessaron, and is expressed in Pythagorean terms thus:

$$4:3 - 2(9:8) = 256:243^7$$

The first four pitches in the diatonic system can be represented thus in diagram form:



Consideration of the moveable semitones (as opposed to the permanent ones at between B and C, and E and F) leads Johannes to discuss the *ficta* notes, which are derived from the placement of B flat as a whole tone below C, and then proceeding as follows:⁸

B flat	8:9 from C
E flat	3:4 from B flat
A flat	3:4 from E flat
D flat	3:2 from A flat
G flat	3:4 from D flat

⁷*Ritus Canendi Pars prima* 2.7.6-29. For the view expressed by Adkins and also by Lindley that Johannes divided the whole tone solely by arithmetic mean, see Introduction p. 22.

⁸*Ibid Pars prima* 2.10.

Such placements of the *ficta* notes support that part of the theory which states that the minor semitone should lie to the left of a black note. Since B flat lies at a tone's distance from C, and since B–C is a minor semitone, then B flat–B is a major semitone. Thus A–B flat is a minor semitone. B–G flat will form a 'wolf' fifth, and G flat and D flat will be less than a Pythagorean whole tone above E and B respectively.⁹

THE SOLMIZATION PROCESS AS AN AID TO SINGING AT SIGHT

The theoretical basis of the process involves the division of the entire pitch compass into a series of overlapping hexachords, all of which have an identical intervallic structure. Thus, the series Γ A B C D E can be transposed to begin on C, and also, by including B flat, to begin on F.

Γ A B C D E
 C D E F g a
 F g a b c d

Each degree of the hexachord was assigned to a syllable, so that each series was represented as *ut re mi fa sol la*. These syllables correspond to the opening syllables of the Hymn 'Ut queant laxis'; whether it was recognised as a characteristic, or whether the hymn was deliberately composed in this way, the initial notes of each of the six phrases relate to the syllabic pitches themselves:¹⁰

⁹And see Lindley *op.cit* p. 10. For a Greek source for the division of the monochord, see *The Euclidian Sectio Canonis* in JanS p. 165, where the *ficta* notes are called 'moveable'. See also *De inst. mus.* 4,13 (335.19-24).

¹⁰*Ritus Canendi Pars secunda* 1.1.24.

When a hexachord was based on G (or, in the case of the very lowest pitch, the Greek gamma), it was referred to as 'hard' ('durum') owing to the presence of the hard or square B ('durum' or 'quadratum'—the modern natural) within this hexachord; the term 'molle' was assigned to the F hexachord because of the 'round' or 'soft' B ('rotundum' or 'molle'); the natural hexachord began on C, and accommodated neither B.

A single hexachord could accommodate only melodies of a limited range, so that the use of such a system would inevitably involve a transition from one hexachord to another. The point at which such a transition took place was known as 'mutation', and the Latin term 'mutatio' refers specifically to the change of syllable whilst retaining the same pitch.¹¹ As the diagram shows, the same pitch could be sung to more than one syllable, and, for example, on G *sol re ut*, six mutations can occur: *sol* to *re*, *re* to *sol*, *sol* to *ut* or *ut* to *sol*, *re* to *ut* or *ut* to *re*. The order in which the syllables were sung, or imagined,¹² depended on whether the melody was to continue upwards or downwards: mutations whose second syllable was *ut re* or *mi* meant that the melody should continue in ascent, and those ending in *fa sol* or *la* meant that the melody should continue in a downward direction, hence the verse:

ut re mi scandunt descendunt fa quoque sol la¹³

Johannes Afflighemensis (c.1100) is the first theorist to refer explicitly to the system, and testifies to its success in practice:

¹¹And see Johannes de Garlandia (?) *De Plana musica*, Paris, Bibliotheque nationale MS Lat.18514, fol.90r : 'Mutatio nihil aliud est quam dimissio unius vocis propter aliam sub eodem signo et sub eodem sono.'

¹²See below p.70.

¹³*Quatuor Principalia* in CS 4 p. 223.

He who wished could learn fully and clearly, melodies either in ascent or descent, with their endless variety.¹⁴

It is not clear how many syllables would have been sung to a single pitch: in the case of *G sol re ut*, it is unlikely that all three would have been sung, and that the syllable which represented the hexachord to which a transition was not being made would have been omitted. Nevertheless, it is evident that, in the case of young singers, there would have been a requirement to sing all the appropriate syllables.¹⁵ At a point of mutation, a more experienced singer would likely have imagined the first and sung the second. A parallel can safely be drawn here with modern sol-fa practice at those points where modulation occurs: in this example, where *la* becomes *re*, the second syllable is sung to the pitch of the first:

se : — | — : se | re : — | f¹ : r¹ | d¹

Johannes' discussion of solmization is extensive, and occupies an entire book of the six which make up the treatise. He, like others, attributes to Guido the invention of the system, though neither the system nor the Hand are described in any of Guido's writings. This attribution is important, since it is Guido whom Johannes thinks he can defend against any accusation of having invented mutation; he feels too that he can accuse the 'moderns' of abusing the essential simplicity of the system through the use of such mutations:

You see, dear reader, that the ancients sang in a different way, and that the moderns have, at the last, made use of *ut re mi fa sol la*, not however with the simplicity with which it was created. And so consult, I beg you, Guido's letter which I have mentioned above, in which he

¹⁴J Smits van Waesberge, ed. Johannes Afflighemensis *De Musica cum Tonario* (CSM I Rome, 1950) p. 50: 'Per has itaque syllabas is, qui de musica scire affectat, cantiones aliquot cantare discat quosque ascensiones et descensiones, multimodasque earum varietates plene ac lucide pernoscant'.

¹⁵*Quatuor Principalia* CS 4 p. 250: 'Intervalla vocum perfecte pronuntientur, ut semitonium pro tono pleno non fiat....' (The intervals of the pitches should be pronounced in their entirety, so that a semitone does not occur where a whole tone should be....).

indicates that he invented the six syllables for our benefit: if there you find so many instances of *fa ut, ut fa, sol ut, ut sol*, or other similar examples....I am prepared to be found false in all respects.¹⁶

Why does Johannes attack so forcefully the idea of mutation? To what extent are his comments based on his own experience of actual practice? His anxiety seems to be two-fold: first, he claims that a 'loss of rhythmic flow' occurs when so many syllables are sung to a single pitch;¹⁷ secondly, the system suppresses the truth by confusing the senses of the pupils by its 'excessive tedium'.¹⁸

But such a view overlooks what common sense tells us would have happened in practice—that the experienced singer would establish the pitch by means of the first syllable (imagined), and then sing the second syllable to the pitch of the first. It is also a view which is more likely to have developed from Johannes' familiarity with written accounts of the system, the writers of which would be obliged to explain the relationship of the syllables to the letter names and the process of mutation. It is inevitable then that the individual pitches would be identified by using the nomenclature, eg *G sol re ut*. A typical illustration of the Guidonian Hand would likewise accommodate the letters, together with all the syllables applicable to each pitch.¹⁹ This would have to be the case for the Hand to have any didactic value, for the singer can approach the mutated pitch

¹⁶*Ritus Canendi Pars secunda 2.2.2-3*: 'Cernis lector vario ritu cecinisse veteres, et ad ultimum modernos *ut re mi fa sol la* non ea quidem puritate qua confectum est usque nunc exercuisse. Quaere quaeso praefatam Guidonis epistolam in qua se nobis illas fabricasse sex syllabas insinuat, et si tot ibi *fa ut, ut fa, sol ut, ut sol*....volo me per omnia fuisse mentitum'.

¹⁷*Ibid. Pars secunda 2.4.2*: '....ad quid nunc penes nos haec perditio temporis?'

¹⁸Johannes here condemns the components of the solmization process—the syllabic ambiguities, the unnecessary mutations, and the different placements of the natural, hard and soft hexachords, and see *Ibid. Pars secunda 2.2.5*: '....tot ambages verborum, tot varia naturarum quadrorum et mollium ordines, totve...superfluae mutationes rudium animos ac ingenia fatigando debilitarent?'

¹⁹An illustration of a typical Hand can be found in *The New Grove Dictionary* vol. 17 p. 458.

with confidence only when he is clear about the first syllable which will then mutate.

It is interesting that Johannes mentions the 'inane writings' of authors whom he does not name, and his comment on these would seem to confirm his over-reliance on the written word at the expense of the practical application of the solmization process:

I do not cease to wonder at the lack of awareness in singers, not only of today but from several ages back, at least as the inane writings of certain people attest.²⁰

So well established was the association between the letter names and the syllables that the four central syllables—*re mi fa sol*—became identified with the four finals of the authentic/plagal modes:

D sol re pro finale
E la mi pro finale
F fa ut pro finale
G sol re ut pro finale²¹

Such associations are conspicuously absent from Johannes' discourse on the ecclesiastical modes, and it is perhaps easy to imagine that he would react against such an alliance, common though it was, given his harsh criticism of what he understood to be the practice of solmization.

Nevertheless, Johannes' attack was by no means a negative one, and as a solution to the problem, he simply states that one syllable only need be sung to

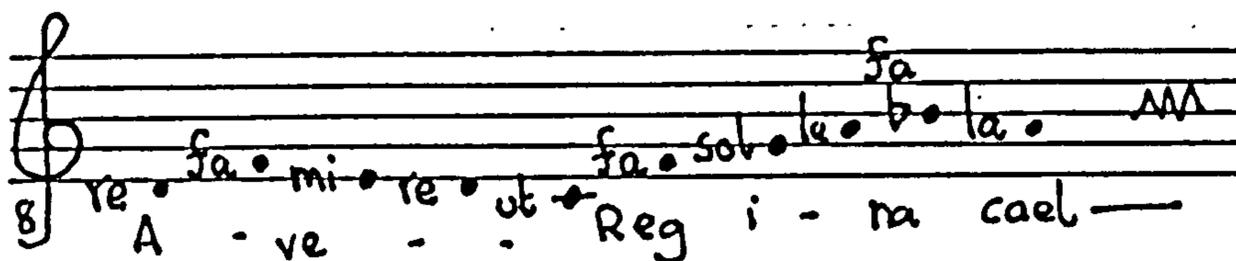
²⁰*Ritus Canendi Pars secunda* 2.1.3: '...mirari non desino tantam cantorum, non nunc tantummodo sed iam a non paucis retroactis temporibus, uti vana quorundam scripta testantur, intellectus inopiam'.

²¹*Tractatus de musica plana cuiusdam Carthusiensis monachi* in CS 2 p. 440.

one note.²² Clearly, the idea of mutation is hereby discredited, and his own diagram demonstrates hexachords which are solmized thus:²³

ut re mi fa sol la
 fa sol la fa sol la
 fa sol la fa fa sol
 sol la mi fa sol la
 G A B C D E F G a b \flat c d e

This musical example from *Ritus Canendi* serves a dual purpose:²⁴



First, it shows that, despite the fact that a transition has taken place from the hexachord *naturale* to *molle*, the pitch on the last syllable of 'Regina' is meant to be sung with one syllable, *la*, whereas the presence of the mutation would mean that two syllables would be involved—*la mi*. But this kind of procedure is not as innovative as it may seem, for the author of *Quatuor Principalia* had previously referred to the fact that, in the case of a semitonal extension of the hexachord, one could mutate normally, or commit an abuse of the system:

If from the *fa* (of *C fa ut*) you wish to ascend to the fourth note above, it is necessary to change the *fa* into *ut*, or to adopt incorrect practice.²⁵

A more pertinent example from the same hymn occurs on the second syllable of 'Maria', at which point the mutation would involve the syllables *re la*.

²²*Ritus Canendi Pars secunda* 2.4.38: '.....scio quod sufficiat una de sex illis syllabis pro qualibet littera....'.

²³*Ibid. Pars secunda* 2.4.33.

²⁴*Ibid. Pars secunda* 2.4.62.

²⁵CS 4 p. 233a: 'sed si a praedicta *fa* ad quartam vocem vellet ascendere, necesse haberet *fa* in *ut* mature (*sic*), aut improprie sumere'. 'Mature', should probably read 'mutare'.

Secondly, the example shows Johannes' acceptance of the *hexachordum molle*, a fact refuted by Reimann, who claimed that Johannes rejected this, and made the rejection a factor in the simplification of solmization. But Johannes assigns to *fa* an importance not enjoyed by the rest of the syllables:

But *fa* seems to enjoy a pre-eminence at any point: from amongst the six syllables, it always marks the limit of the first of the three species of diatessaron; then another *ut* immediately starts taking on the round b.²⁶

It is hard to believe that such a simplification of solmization would have any practical or didactic value, for the absence of the first mutation syllable means that the singer cannot establish those pitches on which mutation takes place in relation to what has gone before. The system, in Johannes' hands, has lost its identity and its independence; it is used merely as a notational system alongside the letter names and square notation:

...and which I may be able to sing, not only by using the letters, but also the syllables and the square notes.²⁷

But what of Johannes' claim to have his own quick and easy method of teaching his fellow-Carthusians?

For I testify before God, his holy angels, and those who see me daily teaching plainsong, that, having rejected totally the six syllables, and all the hard and the soft (hexachords), and the stupidities which the mutations involve, my brother Carthusians learn through me in about a single hour to recognise the fifteen pitches of the ancient philosophers....And they promptly produce the tone and the semitone in all their rightful places; somehow they achieve more in a single month

²⁶*Ritus Canendi Pars secunda* 2.3.13: '*Fa* tamen ubique principatum habere videtur, eo quod primam semper de tribus diatessaron differentiis inter has sex syllabas terminans, mox aliud ut excepto rotundo inchoat....' For Riemann's discussion see Hugo Riemann, *Geschichte der Musiktheorie* (2nd edition, Berlin, 1920) translated into English by Raymond Haggh as *History of Music Theory* (New York, 1974), and see in particular p. 258.

²⁷*Ritus Canendi Pars secunda* 2.4.62: '...et quem non solum per litteras, sed per illas syllabas et notas quadras modulari queam'.

than most people manage to learn in a whole year with the aid of those texts.²⁸

It is worth recalling here Nan Cook Carpenter's observation that Johannes argued 'against the Guidonian system of solmization' and 'advocated a simplification based upon the tetrachord'²⁹ But Johannes' criticism, as we have seen, is not so much against Guido, but against the notion of mutation, which he claims Guido did not invent.³⁰ Again, Johannes seems to divorce himself from practice, since the full use of solmization, which can be applied beyond melodies of a very limited range, cannot be realized without the acceptance of mutation. For 'tetrachord', a term preferably confined within the context of Greek theory as an immutable, should be substituted 'three species of diatessaron', for these, once more, lie at the heart of Johannes' approach to his topic, at the expense of the hexachord.³¹

The process of hexachord transpositions (*coniunctae*) which removes the syllabic hexachord to locations other than G, C or F, with the inevitable ensuing chromaticisms, is not described in *Ritus Canendi*, and the Latin term makes no appearance. Johannes though makes critical reference to the 'different

²⁸*Ibid. Pars secunda* 2.2.12-13: 'Nam testor ego Deum et sanctos angelos, ac eos qui me docere vident cotidie planum cantum, quod abiectis illis sex omnino syllabis, tot quadris tot naturis, totque mutationum illarum frivolis, in una vel circiter hora discunt a me fratres mei Cartusienses quindecim philosophorum discernere voces, in quibus dumtaxat omne planum a principio nostri sancti constituere cantum. Nec mora tonum proferrunt ubique locis debitis ac semitonium, plus in mense quonammodo proficientes quam cum illis iterum philateriis plerique discant per annum integrum'.

²⁹See Nan Cook Carpenter, *Music in the Medieval and Renaissance Universities* (Oklahoma, 1968) p. 138. Cecil Adkins also observes that Johannes is criticizing Guido, and see his article *Johannes Legrense* in *The New Grove Dictionary* vol. 10 p. 615.

³⁰And see Note 16 above.

³¹Johannes is thus bound to overlook another significant feature of medieval theory—the function of the hexachord, which Hermannus Contractus had identified as 'the seat of the tropes' ('sedes troporum') and see L. Ellinwood, ed. *Musica Hermanni Contracti* (Rochester, New York, 1936) p. 57: 'Take any tetrachord you want, for instance the *graves*, and having added a tone on both sides, you have the limits of the modes, which make the seat of the tropes'. For Johannes, the only merit which the hexachord possesses is the ability to accommodate the three diatessaron species (*Ritus Canendi Pars secunda* 2.3.17: 'Nam ab A si coepisset, tres nunquam sub sex litteris sequentibus diatessaron species, nisi cum ingenti confusione vocum exprimere valuisset'). Additionally, Johannes has already overlooked the tetrachordal division of the gamut which produced the tetrachord of the finals, and see above p. 47.

placements of the natural, hard and soft hexachords.³² This attack accords with Johannes' aversion to chromaticisms, but to avoid any discussion of these is not possible since they are a *sine qua non* of the process of perfection of compatible dissonances in counterpoint.

SIMPLE COUNTERPOINT

Johannes' terminology—'contrapunctus simplex'—is enough to identify the style as simple, note-by-note counterpoint above a pre-existent *cantus firmus*, as Prosdocimus describes (1412):

Counterpoint is properly and strictly composed when one single note is placed against another single note in a different melodic line.³³

Johannes further identifies his simple counterpoint with discant, following Jehan des Murs:

Counterpoint is nothing other than point against point, or placing one note against another, which is the basis of discant.³⁴

The rules which govern the style reflect its basic simplicity; one must begin with a perfect consonance—a diapente, a diapason, or a compound of these.³⁵ The diatessaron in this context is dissonant,³⁶ and two perfect consonances in succession are prohibited.³⁷

³²*Ritus Canendi Pars secunda* 2.2.5: '...tot varii naturarum quadrorum et mollium ordines...', and see *Note Ibid* for comments on the translation. For a description of the *coniunctae*, see Anonymous XI in CS 3 p. 426.

³³*Contrapunctus* in CS 3 p. 194: 'Contrapunctus vero proprie sive stricte sumptus, est unius solius notae contra aliquam unicum solam notam in aliquo cantu positio'. For Johannes' terminology see *Ritus Canendi Pars secunda* 3.1.5.

³⁴*Ritus Canendi Pars secunda* 3.3.10: '...non consonas, non dissonas, non discantas, sed unisonum facis'. See also Jehan des Murs *Ars Contrapuncti* in CS 3 p. 60: 'Contrapunctus non est nisi punctum contra punctum ponere, vel notam contra notam ponere vel facere, et est fundamentum discantus'.

³⁵*Ritus Canendi Pars secunda* 3.10.27: 'Nunquam a dissonantiis quamquam compassibilibus inchoare, nunquam in illis finire debes'. For a source, see Prosdocimus CS 3 p. 197: '...quod contrapunctus nunquam finiri vel incipi debet nisi in combinationibus perfectis....'.

³⁶*Ritus Canendi Pars secunda* 3.2.6: '...diatessaron...in hac commixtione vocum sive contrapuncto simplici non recipitur' and see Prosdocimus in CS 3 p. 194: 'quaecum sunt dissonantes...sicuti secunda, quarta....'. It is interesting to note that Johannes criticizes those

Johannes follows Marchetto da Padua in defining the ditone and the diapente plus tone as 'compatible dissonances', which need to resolve respectively onto the diapente and the diapason:³⁸



Since the rule states that such progressions should involve either a tone or a minor semitone in the respective parts, it follows that the smaller intervals of the semiditone and the diapente plus semitone cannot resolve in this way without the addition of a further semitone to enlarge them.³⁹ In writing, such conversions are brought about by the addition of the diesis sign which, in this contrapuntal context, involves the addition of the major semitone (the *apothome*) to the smaller intervals:

In this context, the diesis is a particular division of the whole tone into two parts. Through this, by an extension of this sort, the apothome, the larger part of the whole tone, is added on above to the smaller dissonances.⁴⁰

Albert Seay poses an interesting question regarding the addition of the diesis signs in Johannes' musical example, claiming it to be a possibility that they were added by a later hand. Were they to have been added by Johannes, this is

writers who discard the Greek terminology in favour of the Latin, and see *Ritus Canendi Pars secunda* 3. Preface 9: '...nec tertiam quartam quintam, sicque de caeteris, hic audire volo'.

³⁷*Ritus Canendi Pars secunda* 3.10.30: 'Cave tamen ne duas unquam feceris consequenter perfectas consonantias....' and see Prosdocimus *op.cit.* p. 197: 'nunquam ascendere vel descendere debemus cum eadem combinatione perfecta concordante'.

³⁸*Ritus Canendi Pars secunda* 3.3.1 *et passim*. The musical examples are from *Lucidarium* 5.6.13.

³⁹*Ritus Canendi Pars secunda* 3.2.12: '...ut nunquam ab illis nisi per tonum et minus semitonium....'. Riemann (*op.cit.* p. 260) seems to interpret the tone and minor semitone as both belonging in the same part, and so makes little sense of Johannes' statement here.

⁴⁰*Ritus Canendi Pars secunda* 3.2.19: 'Est autem hic diesis quaedam toni duabus in partibus sectio, per quam huiusmodi prolatione minoribus dissonantiis apothome, quod maior pars est toni, desuper adiungitur ...'. Marchetto, on the other hand, achieves perfection through his use of the diesis as a fifth part of the whole tone, and see *Lucidarium* 5.6.23.

evidence that the solmization syllable remains the same, despite the presence of the sign:⁴¹



The musical example serves to demonstrate the procedures of this contrapuntal style, which involves, of the three compatible dissonances, the perfection of the middle one. Of the music, Johannes writes:

As you see, after the bisdiapason, I progress through three compatible dissonances in succession, and by means of the bisdiapason on low C, I grant them their perfection, first by ascending by a minor semitone in the highest register, and descending in the low register by the distance of a whole tone, and secondly, by making complete the one incomplete dissonance of the three through the use of the diesis, the sign for which I have placed at that point.⁴²

This isolated reference to the addition of the diesis sign above an unchanged syllable nevertheless provides a strong case for assuming that all other diesis signs, both in the musical example and in the diagrams which Johannes has drawn to illustrate the consonances and the compatible dissonances with their perfections, are also Johannes' own additions.

Seay's ultimate concern here is the use of the syllables in performance, and whether in practice any chromaticism would leave the syllable unchanged. It is fair to say that it is impossible to assign a syllable to an isolated chromatic note when no change of final is involved. However, it is possible that Johannes

⁴¹*Ritus Canendi Pars secunda* 3.10.36., and see also Albert Seay, *Additional Remarks and Corrigenda to Johannes Gallicus: Ritus Canendi* (undated).

⁴²*Ritus Canendi Pars secunda* 3.10.45: 'Post bisdiapason ut vides per tres continuas procedo dissonantias compassibiles, quibus in C gravi suam per bisdiapason trado perfectionem, ascendendo videlicet uno in superacutis minori semitono et in gravibus per tonum integrum descendendo, necnon unam de tribus illis dissonantiis non integram per diesin, quam ibi signavimus integrando'.

here reflects the abuse of the system documented by the author of *Quatuor Principalia*—of avoiding mutation, and using the wrong solmization syllables, particularly on sharpened leading notes:

Moreover, when they say *sol fa sol*, or *re ut re*, they sing a semitone instead of a tone, and thus they throw the diatonic order into confusion, and falsify the chant.⁴³

Seay also suggests that the contrapuntal style which Johannes describes is improvisatory and sung 'supra librum'—a term which makes its first appearance in Tinctoris, and is thereafter used only with reference to him.⁴⁴ It is a view which draws the distinction between written counterpoint (*res facta*) and that which is assumed to be improvised (*cantare supra librum*), but it is also a view which has more recently been discredited.⁴⁵

The extensive account of *contrapunctus simplex*, latterly in dialogue form, provides Johannes with a base for an offensive against not merely secular music, but measured music of all kinds:

For there are some amongst you who aim for nothing other than those wanton ditties and 'figurative' song as they call it, and silly diminutions of pitch; they utterly despise the sacred chant instituted by Mother

⁴³CS 4 p. 250: 'Insuper cum *sol fa sol*, aut *re ut re* pronuntiant, semitonium pro tono mittunt, et sic genus diatonicum confundunt, ac planum cantum falsificant'.

⁴⁴Albert Seay, ed. *Ritus Canendi Pars prima* p. iv. For Tinctoris' coinage, see Albert Seay, ed. *Opera theoretica*, in two volumes, CSM (Rome 1975) *Liber de arte contrapuncti* (1477) II.p. xx: 'But that which we make together mentally we call counterpoint in the absolute [sense], and they who do this are vulgarly said to sing upon the book ('At istum quem mentaliter conficimus absolute contrapunctum vocamus, et hunc qui faciunt super librum cantare vulgariter dicuntur'). The English translation is by Margaret Bent in *Resfacta and Cantare supra librum* in JAMS 36 (1983) p. 372.

⁴⁵Margaret Bent (*Ibid.*) argues that, since the evidence shows that the composer conveyed his intentions to the singer either in writing (*scripto*) or orally (*mente*), it is wrong to associate the latter with some kind of unpremeditated improvisation. Thus, in *contrapunctus simplex*, it was incumbent upon the singer to apply his knowledge of counterpoint and *musica ficta* so as to ensure the correct progression from dissonance to consonance, even when, as Johannes suggests, the diesis sign was not present. (*Ritus Canendi Pars secunda* 3.10.13: 'A te quidem didici quod sit tale signum# quo, viso vel non viso, mox tonum in duas partes sursum aut deorsum scindimus....'). This having been said, *cantare supra librum* seems applicable in the context of *Ritus Canendi*, since it involves the addition of a vocal line above a pre-existent tenor.

Church in her prudence; throughout their entire lives they never cease to rave about the longs, the shorts, and other figures of this kind which do not serve any worthy purpose.⁴⁶

Johannes himself provides musical examples to show the contrast of styles: the melody upon which he bases his simple counterpoint is a pre-existent chant melody;⁴⁷ on the other hand, the relatively elaborate three-part setting composed by himself for his own hymn he inserts in the treatise not because he approves of the style, but because he is anxious to show others that he can handle the technique:

Let me say this, not to show any interest in the wanton nature of contemporary melody, which my soul, through love of Christ, utterly denounces, but that men should not say of me: 'He was ignorant of our melodic patterns and wanton rhythms....'⁴⁸

The complete picture then is that of a devout priest and choir-monk who is imbued with violent reactions against the modern measured styles.⁴⁹ The picture is set against a Renaissance background: we see a man fired with an enthusiasm to approach Boethius with critical eyes, a fact which has resulted in his inspirational grasp of at least the basis of the Greek *tonoi* as portrayed in Boethius. We see also one who is desperate to impose upon medieval modal theory the authority of the Greek diatonic system. This he does by imposing

⁴⁶*Ritus Canendi Pars secunda* 3. Preface 5: 'Sunt namque de vobis nonnulli qui nil aliud quam lascivas illas cantilenas, de cantu sicut aiunt figurato, nilve praeter vanam vocis fractionem appetunt, spretoque penitus cantu divino quem sobria mater instituit ecclesia toto vitae suae cursu quidem circa longas breves aut caeteras huiusmodi nullius industriae laudabilis figuras delirare non cessant'. For a definition of 'cantus simplex figuratus' by Tinctoris, see *Terminorum musicae diffinitorium* (translated and annotated by Carl Parrish, (London, 1963)) pp. 16-17: 'Simple figurative melody is that which is composed in a simple way by using notes of a particular value ('Cantus simplex figuratus est qui figuris notarum certi valoris simpliciter efficitur'). Synonymous with this is *cantus fractus*—when a note is broken up into smaller note values. For Johannes' reference to shawm players, with whom he was doubtless familiar in the form of the famous *piffari* at Mantua, see Note *Pars secunda* 3. Preface 8.

⁴⁷*Ritus Canendi Pars secunda* 3.10.36.

⁴⁸*Ritus Canendi Pars secunda* 1.12.11: 'Haec autem dicta sint, non ut mihi cura sit de nostri temporis in cantibus lascivia, quam prorsus amore Christi detestatur anima mea, sed ne....de me dicant "nostras figuras et lascivas mensuras nescivit".'

⁴⁹Thus Johannes' reaction is not only against secular music, as Cecil Adkins suggests, and see *Johannes Legrense* in *The New Grove Dictionary* vol. 10 p. 615.

medieval thinking on the system itself—not least by regarding the immutable tetrachord merely as one of the three diatessaron species.

This preoccupation with species lies at the heart of Johannes' approach to modal theory, but there are two ironies: first, he does not realize that the *modi* which Boethius described were themselves octave species; secondly, he allies himself closely though covertly with Marchetto da Padua through his emphasis on species as a prerequisite of modal classification, whilst on the other hand making Marchetto a target for severe and outspoken criticism for his anti-Pythagorean views.

We have seen too that such a preoccupation with the species results not only in Johannes' isolation from significant areas of modal theory, but from actual performance and teaching practice. The pressing question must be whether, on occasions when he rejects the accommodation of B flat in the chant, he is seeking to impose on his fellow-Carthusians a reform of the chant which is contrary to the established practice of the Order.⁵⁰ It is possible that a general reaction against his chant theories and his teaching methods at the Mantuan Charterhouse undermined Johannes' self-confidence, and prompted his move to Pavia, there to seek the approval of the university teachers for his treatise in general, and for his theories and teaching methods in particular.⁵¹

How were Johannes' theoretical views received by later theorists? There is no evidence to show that any other writer overlooked the notion of transposition, and adopted his solution to the problem posed by those chants which 'close' on

⁵⁰Certainly, in his article *Le Chant des Chartreux*, Fr. Benoit-M. Lambert (*Revue belge de musicologie* 24 pp. 29-30) produces evidence to show that, at the end of the 11th century, it was common in the first and fourth modes for B flats to be sung which were not notated. As part of what seems to be a well-established tradition, he also observes that there was, during the fourteenth and fifteenth centuries, a tendency to 'sweeten' the chant with the excessive use of B flat (*Ibid.* p. 30), and Johannes himself cautions against such excess (*Ritus Canendi Pars secunda* 1.8.19: 'Dulce quidem est b rotundum ob quandam minoris semitonii molliciem, sed dulcius est mel quod nimie sumptum facit dolere ventrem').

⁵¹The reference is to John Hothby's comment upon Johannes' particular concern, and see Introduction p. 9 footnote 23.

a *b* or *c* –that they should lie outside the system.⁵² Even Burtius, Johannes' pupil, who frequently cites his teacher, in this crucial respect relates more closely to Marchetto: those chants which close on *a* he assigns to the fourth mode on the grounds that the diatessaron species EFG*a* is characteristic of mode IV. In Marchettan terms, this species, with its equivalent BCDE, would be 'proper' to the deuterus modes.⁵³ This difference of approach to modality by his own pupil must surely highlight Johannes' isolation from the mainstream of modal theory.

We have observed that the notion of species is crucial to Johannes' argument on modality. It is a notion which provides the unifying force between theory and practice in *Ritus Canendi* because of its importance for Johannes in the teaching of the chant: the hexachordal syllables are discarded in favour of the diatessaron. We see how Johannes' radical views on the complexities of mutation were regarded with approval by Ramos de Pareia, who, like his predecessor, was encouraged to abandon the hexachordal structure; for Ramos, the octave became the basis for the formulation of new solmization syllables, so that one mutation only was necessary.⁵⁴

It is tempting to regard Johannes merely as one who approaches his subject 'as a true conservative',⁵⁵ in the light of his reaction to measured music, religious as well as secular. However, it is easy to imagine that a monk as devout as he would adopt such views.⁵⁶ Perhaps such a label is justified if we are to regard Johannes as part of the medieval theoretical tradition, and take into account his aversion to chromaticism and the Marchettan division of the tone. But this kind of reaction is not that of a medieval conservative, but stems from Johannes'

⁵²See Introduction pp. 52-55.

⁵³*Ibid.* p.55.

⁵⁴For Ramos' syllables *Psal-li-tur per voc-es Ist-as* see Ramos *Musica practica* p. 30, and Albert Seay's article *Ramos de Pareia* in *The New Grove Dictionary* volume 15 p. 576.

⁵⁵See Albert Seay ed. *Ritus Canendi* volume 1 p.iv.

⁵⁶And as one loyal to the Christian tradition, Johannes credits Jubal, not Pythagoras, with the discovery of musical intervals, and his devotion to Brother Guido is unequivocal.

embrace of the diatonic system of Antiquity as a major factor in his thinking:

Johannes is thus a true Renaissance humanist, and becomes Vittorino's spiritual successor in a very real sense.

ADDITIONAL SOURCES AND OBSERVATIONS

LITURGICAL SOURCES -
ABBREVIATIONS USED IN THE NOTES

1. PRINTED

- AM* *Antiphonale monasticum pro diurnis horis....*(Paris, Tournai, Rome; Desclée No. 818; c.1934)
- AN* *Antiphonarium Nocturnum (Pars Aestivalis)* (Chartreuse de Notre Dame des Prés, Montreuil-sur-Mer, 1876)
- AR* *Antiphonale sacrosanctae Romanae ecclesiae....*(Paris, Tournai, Rome, Desclée No.820; 1949)
- LR* *Liber responsorialis pro festis I.classis....*(Solèsmes, 1895)
- OHS* *Officium hebdomadae sanctae et octavae Paschae....*(Rome, Tournai, Paris, New York; Desclée No. 914: 1962)
- PM* *Processionale monasticum ad usum congregationis Gallicae....*
(Solèsmes, 1893)
- ST* Bruno Stäblein, ed., *Hymnen (1): Die mittelalterlichen Hymnenmelodien des Abendlandes*

2. MANUSCRIPT

- GB* Le Codex VI. 34 de la Bibliothèque Capitulare de Bénévent (XIe-XIIe siècle): *Graduel de Bénévent avec prosaire et tropaire* (Paléographie musicale, XV; Tournai, 1937)
- GrS* Walter Howard Frere, ed., *Graduale Sarisburiense; a Reproduction in Facsimile of a Manuscript of the Thirteenth Century*
- LA* *Antiphonaire monastique; XIIe siècle: Codex 601 de la Capitulare de Lucques* (Paléographie musicale, XI; Tournai, 1922)
- SYG* Le Codex 903 de la Bibliothèque National de Paris (XIe siècle; *Graduel de Saint-Yrieix* (Paléographie musicale, XIII; Tournai, 1925)

WA Antiphonaire monastique; XIIIe siècle: Codex F.160 de la Bibliothèque de la cathédrale de Worcester (Paléographie musicale XII; Tournai, 1922)

PARS PRIMA

- Preface 2 A similar observation on the universality of musical language occurs in G. Massera, ed. *Giorgio Anselmi Parmensis De Musica* (Florence 1961) p. 193: 'Artium mandata constare debent, et non arbitraria et varia, sed communia et nota. Et si cantilenarum modos et diversitates ad infinitum variari contingat, per hoc tamen non differt harmonia cantabilis ab artibus ceteris, et earum sunt finita mandata et communia et paucis limitata cum ad infinitum partialia et singularia procedant'.
- Preface 7: For similar observations on Johannes' view of such teaching methods, see *Ritus Canendi Pars secunda* 2.2.6.
- Preface 16 One example, from among many, of the derivation of the word 'music' from 'water' occurs in Marchetto *Lucidarium* 1.6.2-3: 'Musica dicitur a moys, quod est aqua, eo quod iuxta aquas inventa fuerit, ut Remigius refert'. The source for Marchetto's reference to Remigius is Martianus Capella 286.17 *Libri Noni Praefatio*. For studies of this derivation, see the article *Musica dicitur a Moys, Quod Est Aqua* by Noel Swerdlow in *JAMS* 20 (1967) 3-9. Sowa's Anonymous (H.Sowa, ed. *Ein anonymerglossierter Mensuraltraktat 1279* (Kassel, 1930) suggests alternatively that the word derives from *moys* ('water') and *sicox* ('wind') because it was from the wind and the water in hollowed-out rocks by the sea that the sound of the sirens is thought to have arisen; hence presumably Johannes' allusion to stones and subterranean caverns.
- 1.1.7. Judith Cohen (*Jubal in the Middle Ages—Dissertation*, University of Tel-Aviv, 1975) provides evidence that Josephus'

PARS PRIMA

ascription of the construction of the two pillars to Jubal occurs only in 'contaminated' Latin translations of *Jewish Antiquities*; Josephus attributed this to Seth and his descendants. Peter Comestor, in *Historia Scholastica* (PL 198 p. 1079) follows closely the contaminated version. Later writers followed Comestor's version—Vincent de Beauvais in the eighteenth book of *Speculum Doctrinale* (ed. G. Goller, *Vinzenz von Beauvais uns sein Musiktraktat in Speculum doctrinale* (Regensburg, 1959, p. 105), and Jacques de Liège *Speculum* 6 pp. 25-26. Burtius (*Florum Libellus* pp. 75-76) discusses Johannes' comments on the pillars at some length, but cannot agree with his teacher, since he cannot find in Josephus any support for the latter's views—only the ascription of the pillars to Seth and his descendants.

- 1.2.12. These analogies are discussed by Margarete Apel in *Terminologie in den mitteralterlichen Musiktraktaten Ein Beitrag zur musikalischen Elementahrelhre des Mittelalters* (Bottrop: Postberg, 1935) p. 24, and see Marchetto *Lucidarium* 9.1.2.f.(a).
- 1.3.6. See also Nicomachus *Manual* v (JanS p. 42) translated Barker *Greek Musical Writings*, p. 253. For the Greek source, see Nicomachus xii in JanS p. 261: 'ἐπίπτωσις φωνῆς ἐπί μιᾶν τάσιν και ἅπλῆν' (Barker *op.cit.* p 266). Though there are many instances where 'vox' can rightly be translated as 'pitch', in this instance, the original Greek confirms that Boethius has

PARS PRIMA

translated φωνη ('voice') as 'vox'. But see *Anicius Manlius Severinus Boethius, Fundamentals of Music*, translated with Introduction and Notes by Calvin M. Bower (Yale, 1989), p. 16 (hereafter *Bower/Boethius*). The Greek also confirms that the phrase 'aptus melo' merely explains 'emmeles'. Clearly therefore, Warren Babb's translation of the same sentence in Hucbald's *De Harmonica Institutione* (Palisca, ed. *Hucbald Guido and John on Music*, Yale 1978 p. 21) is suspect: 'sound is the particular melodious (ἐμμελής) category (*casus*) of tone that is suitable for song, maintaining a steady pitch [*una intensione*]..... .' The definition ultimately derives from *Aristoxenus Elementa Harmonica* 15.15-16 (Barker, *op.cit.* p. 136).

- 1.3.8. See also Nicomachus *Manual* xii (JanS p. 261):
 Διάστημα δ'ἔστί δυδὶν φθόγγων μεταξύτης (Barker *op.cit.* p. 266, *Aristoxenos op.cit.* 15. 24-32 and Barker *Ibid* p. 136).
- 1.3.14. The treatise *Summa musicae* is of unknown authorship and has been misattributed to Jehan des Murs (see Lawrence Gushee: *Jehan des Murs* in *The New Grove Dictionary* vol. 9, p. 589).
- 1.4.3. Fritz Reckow has identified the term *Character* as:
 1) synonymous with the alphabetical *littera*, or
 2) referring to neumatic or daseian notational signs (see article *Character* in *Handwörterbuch de Musikalischen Terminologie*).
 Since *litterae* are mentioned in the same sentence, and later in this chapter, and not synonymously with *characteres*, it is the second interpretation which is likely here. For an identical use, see *Guido Micrologus* 5,21 (p. 112).

PARS PRIMA

- 1.4.4. It can be regarded only as a possibility that 'The Sparrow' to whom Johannes refers here can be identified with Pietrobono del Chittarino, the celebrated singer and lutenist, a visitor to, or in service in many Italian courts throughout an abnormally long career beginning in the mid 1450s. Johannes' use of the word 'tumultuarias' suggests a strong improvisatory element; the *Ritus* text clearly points to the use of a stringed instrument, and the nickname is meant to characterize an accomplished singer. See Lewis Lockwood, *Music in Renaissance Ferrara 1400-1505* (Harvard, 1984) pp. 95-108.
- 1.4.10 See *Fragments* 1 (JanS p. 266) where, in contrast to Boethius, Nicomachus states that the original *kithara* had seven strings.
- 1.5.4. And see Nicomachus *Manual* ii (JanS) and Barker *Greek Musical Writings*, p. 248. But the fundamental source of these definitions is Aristoxenus *Elementa Harmonica* 3.55ff. and 8.13ff. (Barker, *op. cit* p. 133).
- 1.6.1. Hucbald points out (*De Harmonica Institutione* in GS I p. 117a) that Boethius touches briefly on the meanings of the individual notes, but that Martianus Capella 'expounds it more intelligibly' (*De Nuptiis* in Meibom *Auctores* 2, pp. 179-180).
- 1.6.14. *Neate* is a Doric variant of 'nete'.
- 1.7.3. For the Greek source for the diatonic, enharmonic and chromatic genera, see Nicomachus *Manual* xii in JanS p. 260-265 (Barker, *Greek Musical Writings* pp. 268-9).

PARS PRIMA

- 1.10.8. In order to avoid what would amount to mere transliterations of the numerical terminology, e.g. epitrital, sesquioctaval, etc. I have translated these by using the corresponding arithmetical ratios, in the hope that this will make for easier reading.
- 1.11.10. 'Omnia in mensura et numero et pondere disposuisti'; *Wisdom* II.21. Thus Pythagorean theory gains theological and biblical support, and any attempt to undermine it would have met with strong opposition. See also Cassiodorus: 'Sic arithmetica disciplina magna laude dotata est, quando et rerum opifex Deus dispositiones suas sub numeri, ponderis et mensurae quantitate constituit.' (R A B Mynors, ed. *Institutiones*, Liber II Praef. 3, Oxford, 1937, pp 89-90). English translation from *Cassiodorus Senator, An Introduction to Divine and Human Readings*, trans. Leslie Webber Jones (New York, 1946), pp. 142-143. In the later treatise, the 12th century *Didascalion* of Hugh of St Victor (C H Buttimer, ed. *Hugonis de Sancto Victore Didascalion de studio legendi*, Washington, 1939, p.30,32f.), the basic musical elements are regarded as being weight, number and measure.
- 2.3.8. Hellinger has identified further sources for the notion of 'quantity', and see *Lucidarium* 12.1.3-7.
- 2.4.6. I have refrained from inserting here the prefix 'super' to the words 'sesquialter' and 'sesquitercius' in accordance with Boethius—who writes 'duplex supersesquialter' and 'duplex supersesquitercius' (*De inst. mus.* 1,4 (192.4,6)). Marchetto (*op.cit.*7.1.21-22) adheres strictly to Boethius' terminology,

PARS PRIMA

though, as Hellinger points out, in the MS *Milan, Biblioteca Ambrosiana, D5 inferiore* the prefix has in all cases been crossed out in pencil, as if some doubt existed—as it clearly does in Johannes' mind—on the necessity for the prefix itself (see footnotes *e f g h* on pp. 263-4 of *Lucidarium*).

- 2.5.14 Ptolemy takes the opposite view, in regarding the diapason plus diatessaron as a consonance (Ptolemy *Harmonics* 1.6. and Barber *Greek Musical Writings* p. 287). Marchetto also cannot regard the interval as a consonance (*Lucidarium* 6.5.2-25). On the problem of the eleventh as a consonance, see Barbara Münxelhaus, *Pythagoras Musicus Orpheus*, vol. 19 (Nonn-Bad Godesberg: Verlag für Systematische Musikwissenschaft, 1976), pp. 88-94 (an article identified by Hellinger at *Lucidarium* footnote a).
- 2.7.6. For the definition of *phthongos*, see also Hucbald, *De Harmonica Institutione* in GS 1 p.107 and Guido *Micrologus* 15,3 (p. 162).
- 2.7.11. For a Greek source for the qualitative view, see Aristoxenus *Harmonics* I.10-13 (Barker *Greek Musical Writings* , p 133). The quantitative view is expressed by Ptolemy in *Harmonics* 3 (Barker *op.cit.*,pp. 279-282).
- 2.7.12. And see Ptolemy, *Harmonics* 3.(Barker, *op.cit.*pp.79-282).
- 2.8.5. See Ptolemy *Harmonics* 1.7.15-16 where he refers to the interval of the diapason as 'ὁμοφωνή'. Barker (*Greek Musical Writings*, p. 289) thus translates the term as 'homophones'. In

PARS PRIMA

- f.63, he suggests that the term designating the quality of the octave might be Ptolemy's 'own coinage': at Aristides Quintilius *De Musica* 10.5-6, it implies 'unison', whereas Boethius, following Ptolemy, states that this interval creates the impression of a single sound ('univocus'). Hucbald, whether deliberately or through a misunderstanding of Boethius, uses the term 'aequisonae' for unisons, whereas 'consonae' are simply consonances (*De harmonica institutione* in GS 1 p. 104).
- 2.9.2. Nicomachus subscribes to the Pythagorean doctrine that the whole tone cannot be divided into semitones of equal size (Nicomachus *Manual* xii (JanS p. 264) and Barker *Greek Musical Writings* p. 268), but does not offer the proof provided by Ptolemy (*Harmonics* 1.10) based upon the arithmetical fractions, (Barker *op. cit.* p. 298).
- 2.9.5. For discussion on 'diesis', and the division of the whole tone into five parts, see Introduction p. 23. For the use of 'diesis' in connection with the perfection of consonances, see Note *Pars secunda* 3.2.25 and Introduction p. 76.
- 2.11.4. For details of Guido's monastic life, see his *Epistola de ignoto cantu* in GS 2 pp.43-50, and *Guido of Pomposa* in *New Catholic Encyclopaedia* (New York, 1967) vol. 6, pp. 842-43.
- 3.1.1. For a Greek source for the enharmonic tetrachord see Nicomachus *Manual* xii (JanS p. 262) (Barker *Greek Musical Writings* p. 267).

PARS PRIMA

- 3.5.10. The use of the term 'species' which overlooks the internal order of tones and semitones seems to be peculiar to Johannes, though his definition here is inconsistent with its use in the previous chapters. It also contradicts Boethius' definition in the next sentence, and poses a problem as regards the interpretation of the term 'constitutio', which is Boethius' translation of the Greek 'systema teleion' (*De inst. mus* 4,15 (341.22-25), ie the complete bisdiapason system.
- 3.5.11. Palisca's translation of the definition (*Humanism in Italian Renaissance Musical Thought*, (Yale, 1985) p. 39) needs revision: '.....a certain consonance-producing arrangement that has a particular form according to one of the genera, and whose boundary notes are framed by a particular proportion'. The author has taken 'consonantiam facientis' to agree with 'quaedam positio', whereas 'facientis' should agree with 'uniuscuiusque proportionis'. In *Ibid.* footnote 61 'faciendis' should read 'facientis'.
- 3.7.4. In his discussion of Gaffurio, Palisca (*Humanism in Italian Renaissance Musical Thought* p. 295, f.17) mentions an edition of Boethius' *De Musica* which was published in 1492 by Johannes Gregorius; in the reprint which appeared in 1499, chapter 15 in book IV appears as chapter 14, which corresponds to Johannes' reference here, and there must exist a related manuscript tradition.
- 3.10.6. Ptolemy *Harmonics* II.9.63 (Barker *Greek Musical Writings* p. 334).

PARS PRIMA/PARS SECUNDA

- 3.10.7. Palisca (*Humanism in Italian Renaissance Musical Thought* p. 281) has incorrectly translated 'innotescat' as 'been unknown'.
- 3.10.11. Palisca's translation of this (*op.cit.* p. 281) needs revision: 'This double octave in whatsoever mode you please has altogether different constitutions, both of octave and octave plus fourth'. '...totas alias..... constitutiones' can only mean that Johannes simply states that the bisdiapason system embraces all the lesser systems 'within itself' ('in se....' are the words which Palisca overlooks).
- 3.12.13. The isolated reference to 'the twelve letters' ('duodecim litteris') means that one can only conjecture on its significance: the letters G to d form the smallest series which is able to accommodate the three hexachords, thus:

G A B C D E F G a b c d

PARS SECUNDA

Preface 6 But the rhymes in Gerbert appear as follows:

Solis litteris notare optimum probavimus
Quibus ad discendum cantum nihil est facilius
Si assidue utantur saltem tribus mensibus'.

See also Jacques de Liège *Speculum*, p. 211. I acknowledge here the kind interest taken by Professor Dolores Pesce of Washington University in the unusual reading present in *Ritus Canendi*: she points out that only the early manuscript *Monte*

PARS SECUNDA

Cassino, Biblioteca Abbaziale 318 bears even the slightest resemblance to Johannes' version . Ramos de Pareia adopts the following version of the rhymes, and see *Musica*, p. 13:

'Solis notare litteris optimum probavimus
Quibus ad addiscendum (*sic*) nihil est facilius
Si frequentatae fuerint saltem tribus mensibus.'

- 1.1.3. For a comparative and diagrammatic study of the gamuts, see Claude Palisca, ed. *Hucbald, Guido and John on Music*, p. 99.
- 1.1.7. For the use of 'prolatio' in the sense of 'range', see *Ritus canendi Pars prima* 1.4.18: 'In prolatione tamen differunt uti tonus a quo nascuntur minus semitonium.....'
- 1.2.3. Though Johannes' comment relates to Guido's 'contemporaries' ('moderni sui temporis'), the evidence shows that Guido's moderns are earlier medieval theorists, who added the gamma pitch to the Greater Perfect System of the ancients: the author of *Musica enchiriadis* added this lowest pitch (Schmid, ed. p. 5).
- 1.3. 5. Warren Babb (*Hucbald, Guido and John on Music* p. 61) translates 'vocum consonantiae' as 'melodic intervals'.
- 1.4.9. 'Simile est regnum':WA 430.
- 1.4.14. 'Adiutor'/'Quoniam non in finem': GR 74; SYG 58; GB 56; GS 24. 'Beatus servus': GR (45); SYG 28; GB 29; GrS 223. Marchetto's discussion of this chant is detailed, as it provides an example of 'tonus acquisitus' (and see Introduction p.55).
- 1.4.16. 'Prope est Dominus'/'Laudem Domini':GR 21; SYG 8; GB 7; GrS 6.

PARS SECUNDA

- 1.4.19. 'Qui sedes'/Qui regis': *GR* 7; *SYG* 6; *GB* 5; *GrS* 4.
- 1.5.6. Marchetto (*Lucidarium*.11.4.2.) describes the first tone in terms of species.
- 1.5.8. Marchetto (*op.cit.*11.4.74.) and Berno (*Tonarius* in *GS* 2 p. 84) assign the Introit 'Statuit ei Dominus' to Mode I. Hucbald however discusses the chant with reference to the synemmenon tetrachord, thus necessitating the use of B flat. (*De harmonica institutione* in *GS* 1 p. 113). Sources of this chant:*GR* 4 43; *SYG* 37; *GB* 41;*GrS* 220.
- 1.5.11. 'Venite adoremus':*GR* 371; *SYG* 252; *GrS* 170; *GB* 258.
- 1.5.17. 'Nemo te condemnavit mulier': *AR* 396; **AM* 371;**WA* 100.
- 1.5.20. 'Usque quo exaltabitur'/Qui tribulant': *LA* 167; *WA* 114; *BH* 426.
- 1.5.28 'Sicut novit me pater': *AR* 471; *AM* 485; *WA* 142; *LA* 235.
- 1.5.31. 'Alias oves habeo': *AR* 472; **AM* 486.
- 1.5.37. 'Videntes stellam magi': *AR* 331; **AM* 298; *WA* 55; **LA* 74.
- 1.5.40. 'Beatam me dicent': *PM* 258; *LR* 257; *LA* 444; *WA* 356.
- 1.6. 4. 'Quam pulchra es et quam': *WA* 361; 'Quam pulchra es Gertrudis': *AM* 1128; 'Quam pulchra es Maria': *PM* 272. 'De Sion exhibit lex': *AR* 221; *AM* 192; **WA* 9, 61; *LA* 7; *CS* 2, 16. 'Dominus defensor vitae meae':*WA* 61. 'Domine probasti me': *AR* 179; **AM* 149, 150; *WA* 68; *LA* 99. 'Fidelia omnia mandate': *AM* 125; *WA* 63; **LA* 87. 'In conspectu angelorum': *AM* 146, 147; **WA* 67, 384; **LA* 96. 'Benedictus Dominus in aeternum': *WA* 69; *LA* 100. 'Sit nomen Domini....in saecula': *AR* 47; *OHS* 159; *AM*1127; *LA* 87. 'Benediximus vobis in nomine...': *WA* 64; *LA* 90.

PARS SECUNDA

- 1.6.11. 'Sint lumbi vestri praecinti': *LR* 201.
 'Fulcite me floribus': *AR* 675, 844; *AM* 1048.
- 1.6.13. 'Iuravit Dominus et non paenitebit': *AR* (10).
- 1.7.7. 'Benedicta tu in mulieribus': *AR* 221; *AM* 193; *LR* 246, 375; *WA* 9, 268; **LA* 7, 444; *CS* 2 p. 26. 'Sicut myrrha electa': *LR* 246; **WA* 268; *LA* 347, 383; 'Dominus regit me': *WA* 60; **LA* 80. 'Media nocte clamor factus': *LR* 224; **WA* 434; *LA* 546.
 'A summo caelo': 'In sole posuit tabernaculum': *GR* 14; *GrS* 8; **SYG* 10; *GB* 8. 'Si bona suscepimus': *LR* 422; *LA* 282; **WA* 171. 'Vide quia tribulor': *WA* 107.
- 1.7.10. 'Domine in misericordia tua': not found.
 'Ab occultis': *GR* 142; *SYG* 103; *GB* 91; *GrS* 65.
 'Confortamini manus fatigate': *LA* 4. 'Conclusit vias meas': *LA* 176; **WA* 115; *AS* 204.
- 1.8.7. 'Rorate caeli desuper': *GR* 21 (81); *SYG* 8; *GB* 6 *GrS* 5.
- 1.8.21. 'Vespere autem': *AR* 442; *GR* 239; **AM* 450; *WA* 127; **LA* 207, 234.
- 1.8.24. 'Ecce iam plenitudo': *WA* 23.
- 1.9.19. 'Ecce nunc tempus acceptabile': *LR* 403; *LA* 127; **WA* 85.
- 1.9.20. 'Mirabilis Deus': *AN* 269.
- 1.10.49. 'Nos qui vivimus': *AM* 132, 133. For Gaffurius' evidence, and the untransposed version of this antiphon which is assigned to the seventh tone, see Dolores Pesce *The Affinities and Medieval Transposition* p.108.
- 1.10.55. 'Gloria Laus et honor': 1. *ST* 484; 2. *GR* 176; *OHS* 99; **WA* 210; 3. *ST* 485; *GB* 107v.

PARS SECUNDA

1.11.12-16. Here, the modern transcription of Johannes' setting is by Albert Seay, and see his own edition of *Rirus Canendi (Pars Secunda* p. 43) where the version according to H.6525 appears. Seay has also transcribed the A.22315 version (*Ibid.*p. 44), with its more elaborate *Contratenor*. For his rejection of Coussemaker's transcription (CS 4 p.370) and his further observations on the settings see *Ibid.*p. 45.

2.1.20. At the same time, Guido describes his notation thus: 'Quos ordines ut melius possis discernere, spissae ducuntur lineae, et quidam ordines vocum in ipsis fiunt lineis, quidam vero inter lineas, in medio intervallo et spatio linearum'. (For the significance of 'ordines', see Note 2.2.5. below.) Guido testifies to his audience with Pope John XIX (1024-1033): 'The Pope accordingly was greatly pleased by my arrival, conversing much with me and inquiring of many matters. After repeatedly looking through our Antiphoner as if it were some prodigy, and reflecting on the rules prefixed to it, he did not dismiss the subject or leave the place where he sat until he had satisfied his desire by himself learning to sing a verse without hearing it beforehand, thus quickly finding true in his own case what he could hardly believe of others'. (*Epistola de ignoto cantu*, with English translation by O.Strunk in *Source Readings in Music History* p.122). See also GS 2 p. 43: 'Multum itaque Pontifex meo gratulatus est adventu, multa colloquens et diversa perquirens nostrumque velut quoddam prodigium saepe revolvens antiphonarium, praefixasque ruminans regulas, non prius destitit, aut de loco in quo sedebat, abscessit, donec unum

PARS SECUNDA

versiculum inauditum sui voti compos ediscerat, ut quod vix credebat in aliis, tam subito in se recognosceret'.

2.2.5. Riemann, in his translation of this sentence, has overlooked the fact that 'Eis qui Dei sunt' must refer to the title of a specific chant. This having been said, the chant cannot be traced. And see *Geschichte der Musiktheorie* (Berlin, 1920) translated into English by Raymond Hagg as *History of Music Theory* (New York, 1974), and see pp. 257-258.

2.4.62 'Ave regina coelorum' – not found

3.2.17. Riemann (*History of Music Theory* p. 260) believes this sentence to be incorrect, on the grounds that Johannes is here describing a progression of a tone and a semitone in a single part. But in this context, his observation cannot apply—Johannes merely states that when one voice progresses by a semitone, the other progresses by a tone, and see Introduction p. 76.

BIBLIOGRAPHY

THEORETICAL SOURCES

Collections - edited texts

Coussemaker, Edmond de, ed. *Scriptorum de musica medii aevi novam seriem* in four volumes (Paris: Durand, 1865-1865).

Gerbert, Martin, ed. *Scriptores ecclesiastici de musica* in three volumes (San Blasianis, 1784).

Jan, Carl von, ed. *Musici scriptores graeci* (Leipzig, 1895).

Meibom, Marcus, ed. *Antiquae musicae auctores septem* (facsimile of Amsterdam edition, 1695) in two volumes.

Migne, J.P., ed. *Patrologia cursus completus, Series Latina* 221 volumes (Paris 1844-1855).

Collections - with translated texts

Barker, Andrew, ed. *Greek Musical Writings Volume 2* (Cambridge, 1989).

Palisca, Claude V., ed. *Hucbald, Guido and John on Music* (three medieval treatises translated into English by Warren Babb, Yale, 1978).

Strunk, Oliver, ed. *Source Readings in Music History* (New York, 1950).

Individual Treatises

Anonymous: *Alia musica* ed. Jacques Chailley in *Publications de L'Institut de Musicologie de l'Université de Paris*, no.6 (Paris, Centre de Documentation Universitaire, 1965).

_____ : *The Berkeley Manuscript*, ed. Oliver B. Ellsworth (University of Nebraska, 1984).

_____ : *Dialogus* in Gerbert *Scriptores* volume 1 pp. 251-264. Partial translation in Oliver Strunk, ed. *Source Readings* pp. 103-106.

_____ : H. Schmid, ed. *Musica et scholica enchiridis una cum aliquibus tractaculis adiunctis* Bayerische Akademie der Wissenschaften Veröffentlichungen der Musikhistorischen Kommission, Band 3 (Munich, 1981).

_____ : *Quatuor Principalia* in Coussemaker *Scriptores* volume 4 pp. 200-298.

_____ : Sowa, H. ed. *Ein anonymerglossiertex Mensuraltrakt 1279* (Kassel, 1930).

_____ : *Summa musicae* in Gerbert *Scriptores* volume 3 pp. 190-248.

_____ : *Tractatus de musica plana cuiusdam Carthusiensis monachi* in Coussemaker *Scriptores* volume 2, pp. 434-83.

Anselmi, Giorgio: *De Musica*, ed. G. Massera *Historiae Musicae Cultores* 14. Florence: Leo S. Olschi, 1961.

Aristides Quintilianus: *De Musica*, ed. R.P. Winnington-Ingram, Leipzig, 1963.

Aristoxenus: *Elementa Harmonica*, ed. R. da Rios, Rome, 1954.

Bacchius Senior: *Introductio artis musicae* in Meibom *Auctores* volume 1.

Berno of Reichenau: *Prologus ad tonarium* in Gerbert *Scriptores* volume 2 pp. 62-91.

Biblia Vulgata - *Biblia Sacra iuxta Vulgatam Clementinam Nova Editio* (Biblioteca de Auctores Cristianos, Matriti, 1982).

Boethius, Anicus Manlius Severinus: *Fundamentals of Music*. Translated with Introduction and Notes by Calvin M. Bower. Ed. Claude V. Palisca (Yale 1989).

Boethius: *De Institutione Arithmetica libri duo. De Institutione musica libri quinque. Accedit geometrica*, ed. Friedlein (Leipzig, 1867).

Burtius, Nicolaus: *Florum Libellus*, ed. G. Massera, *Historiae Musicae Cultores* 28. Florence, Leo.S. Olschki, 1975.

_____ : *Musices opusculum* (Bologna, 1487; facsimile edition, Bologna, 1969).

Calcidius: *Timaeus a Calcidio translatus commentarioque instructus* ed. J.H. Waszink (Corpus Platonicum medi aevii) London and Leiden, 1962.

Cassiodorus: *Institutiones humanarum litterarum*, (trans. H.D. Goode and G.C. Drake, Colorado Springs, 1980).

_____ : *Cassiodori Senatoris Institutiones*, R.A.B. Mynors, ed. (Oxford, 1937).

_____ : *An Introduction to Divine and Human Readings* –translation by Leslie Webber Jones (New York, 1946).

Cleonides: *Introduction to Harmonics* in *Jan Scriptorum* pp. 167-207.

Comestor, Peter: *Historia Scholastica* in *Patrologia Latina* volume 198.

Gaffurius, Franchinus: *Theorica musice* (Milan, Ioannes Petrus de Lomatio, 1492).

Gaudentios: *Eisagoge* in *Jan Scriptorum* pp. 327-356

Guido d'Arezzo: *Aliae regulae* in *Gerbert Scriptorum* 2 p. 34.

_____ : *Micrologus*, ed. J. Smits van Waesberghe (Corpus Scriptorum de Musica 4, Rome, 1955).

_____ : *Epistola de ignoto cantu* in Gerbert *Scriptores* volume 2, pp. 43-50

_____ : *Regulae rhythmicae*, ed. Gerbert in *Scriptores* volume 2, p. 25.

Hermannus Contractus, *Musica* ed. L. Ellinwood as *Musica Hermanni Contracti* (Rochester, New York, 1936).

Hothby, John: *Johannis Octobi tres tractaculi contra Bartholomeum Ramum*, (ed. A. Seay, *Corpus Scriptorum de Musica* 10. American Institute of Musicology, Rome, 1964).

Hucbald: *De harmonica institutione* in Gerbert *Scriptores* volume 1 pp. 10-121, translated into English by Warren Babb as Hucbald, *Melodic Instruction* in Claude V. Palisca, ed. *Hucbald, Guido and John on Music* pp. 13-44.

Hugh of St Victor: *Didascalion* in C.H. Buttimer ed. *Hugonis de Sancto Victore Didascalion de studio legendi* (Washington 1939).

Jacques de Liège: *Jacobus Leodiensis Speculum musicae*, ed. R. Bragard (*Corpus Scriptorum de Musica* 3, Rome, 1955-73).

Jehan des Murs: *Musica speculativa* in Gerbert *Scriptores* volume 3 pp. 249-83.

Jerome of Moravia: *Tractatus de Musica* in Coussemaker *Scriptores* volume 1 pp. 1-74.

Johannes Aegidius Zamorensis: *Ars Musica* in Gerbert *Scriptores* volume 2.

Johannes Afflighemensis: *De musica cum tonario* ed. J. Smits van Waesberge (*Corpus Scriptorum de Musica* 1, Rome 1950).

Johannes Ciconia: *Nova Musica* ed. S. Clercx in *Johannes Ciconia* volume 1 (Brussels, 1960).

Johannes de Garlandia: *Introductio musicae* in Coussemaeker *Scriptores* volume 1 pp.157-75.

_____ : *De plana musica* (Paris Bibliothèque nationale MS. Lat.18514).

Johannes Gallicus: *Ritus canendi vetustissimus et novus* in Coussemaeker *Scriptores* volume 4 pp. 298-396.

_____ : *Ritus canendi vetustissimus et novus*, ed. Albert Seay (Colorado Springs, 1980) in two volumes.

Johannes Tinctoris: *Johannis Tinctoris Opera Theoretica* (Corpus Scriptorum De Musica, 22, Rome, 1975).

_____ : 1) *Terminorum musicae diffinitorium*, ed. and trans. Carl Parrish (London, 1963).

2) : Ms. Brussels Biblioteque Royale 11.4147.

_____ : *De inventione et usu musice*. Text, with English trans. by A. Baines in *The Galpin Society Journal* 3 (1950).

Josephus: *Jewish Antiquities* in manuscript:

1) Copenhagen, Royal Library, GL Kgl. Saml 156;

2) _____ : GL Kgl. Saml 157.

_____ : *Jewish Antiquities* Books i-iv: trans. H.ST.J.Thackeray (Loeb Classical Library, Harvard, 1930)

Macrobius: *Commentarius in Somnium Scipionis*, trans. as *Commentary on the Dream of Scipio* by W. H. Stahl (New York 1952).

Marchetto da Padua: *The Lucidarium of Marchetto of Padua*, A Critical Edition, Translation and Commentary, ed. Jan W. Herlinger, (Chicago, 1985).

Martianus Capella: *De nuptiis Philologiae et Mercurii* in Meibom *Auctores* volume 2.

Nicomachus: *Manual* in *Jan Scriptores* pp. 237-265..

_____ : *Peri musikes*—a lost treatise.

Odington, Walter: *Summa de speculatione musica* ed. F.F. Hammond (Corpus Scriptorum de Musica, 14, Rome, 1970).

Prosdocimo da Beldamandis: *Tractatus musice speculative contra Marchettum de Padua* in D. Reffaello Baralli and Luigi Torri 'Il Trattato di Prosdocimo de Beldomandi contro Il "Lucidario" di Marchetto da Padova', in *Rivista Musicæ Italiana* XX (1913).

_____ : *Contrapunctus* ed. Jan W. Hellinger, Lincoln and London, 1984.

_____ : *Expositiones tractatus practice cantus mensurabilis magistri Johannis de Muris* ed. F.A. Gallo (Bologna, 1966).

_____ : Hellinger, ed. *Parvus tractaculus de modo monachordum dividendi*. Lincoln and London, 1987.

Ptolemy: *Harmonics*, ed. I. During, Goteborg, 1930.

Quintilian: *Institutio oratoria*, with an English translation by H.E. Butler (Loeb Classical Library, Harvard, 1958).

Ramos de Pareia: *Musica practica* ed. Johannes Wolf (Publikationen der Internationalen Musikgesellschaft 2. Leipzig, 1901).

Rhabanus Maurus: *Commentario in Genesim* book 2 in *Patrologia Latina* volume 107.

Sigebert de Gembloux: *De viris illustribus* in *Patrologia Latina* volume 160.

Spataro, Giovanni: Ioseph Vecchi, ed. Bologna 1967, *Bartolomei Ramis Honesta Defensio in Nicolai Burtii Parmensis opusculum* (Bologna, 1491) in *Iohannis Spatari Opera Omnia* I.

Theogerus of Metz: *Musica* in Gerbert *Scriptores* volume 2 pp.182-196.

Ugolino of Orvieto: *Declaratio musicae disciplinae*, ed. Albert Seay as *Ugolini Urbevetanis Declaratio Musicae Disciplinae* (Corpus Scriptorum de Musica 3, Rome, 1959).

Vincent de Beauvais: *Speculum doctrinale*, ed. G. Goller as *Vinzenz von Beauvais—uns sein Musiktraktat in Speculum doctrinale* (Regensburg, 1959).

_____ : *Speculum quadruplex sive Speculum maius*, in 4 volumes, reprint of Douai 1624 edition.

LITURGICAL SOURCES

These appear on p. 85 at the start of the *Additional Sources and Observations*, and see John R. Bryden and David G. Hughes: *An Index of Gregorian Chant*, in 2 volumes (Harvard, 1969).

BOOKS, ARTICLES AND DISSERTATIONS

Adkins, Cecil: *Johannes Legrense* in *The New Grove Dictionary* volume 10, pp. 614-615.

_____ : *The Theory and Practice of the Monochord* (Dissertation, University of Iowa, 1963).

Anonymous Carthusian Monk: *Maisons de l'Order des Chartreux—Vues et Notices*, volume 3 (Parkminster, 1916).

Barbera, Andra: *Octave Species* in *Journal of Musicology* 3 (1984) pp. 229-41.

Bent, Margaret: *Resfacta and Cantare supra librum* in *Journal of the American Musicological Society* 36 (1983) pp. 371-91.

Bond, John J: *A Handy-Book of Rules and Tables for Verifying Dates with the Christian Era*, etc. (London, 1869, facsimile reprint by Llanerch Publishers 1991).

_____ : Bower, Calvin: *Boethius and Nicomachus: an Essay concerning the Sources of De Institutione Musica in Vivarium* 16 (1978).

The Modes of Boethius in *Journal of Musicology* 3 (1984) pp. 252-63.

Burney, Charles: *A General History of Music from the Earliest Ages to the Present Period, to which is prefixed, a Dissertation on the Music of the Ancients* volume 1 (London, 1776), ed. Frank Mercer (London, 1935).

Carpenter, Nan Cook: *Music in the Medieval and Renaissance Universities* (Oklahoma, 1968).

Cohen, Judith: *Jubal in the Middle Ages* (Dissertation, University of Tel-Aviv, 1975).

Frobenius, Wolf: *Prolatio* in *Handwörterbuch der Musikalischen Terminologie*, *Archiv Für Musik-Wissenschaft* (Wiesbaden, 1972).

Gallico, Claudio: *Mantua* in *The New Grove Dictionary* volume 11 pp.633-635.

Gavaert: *La melopée antique dans le chant de l'église latine* (Osnabruck, 1895).

Hale, J.R., ed: *A Concise Encyclopaedia of the Italian Renaissance* (London, 1981).

Hay, Denys, and Law, John: *Italy in the Age of the Renaissance* (London, 1989).

Herlinger, Jan W: *Marchetto's Division of the Whole Tone*, in the *Journal of the American Musicological Society* 34 (1981) pp. 193-215.

Hughes-Hughes, Augustus: *Catalogue of Manuscript Music in the British Museum* (London, British Museum) 3 volumes 1909.

Huglo, Michel: *Odo* in *The New Grove Dictionary* volume 13 pp. 503-4.

Hüschen, Heinrich: *Johannes Gallicus* in *Die Musik in Geschichte und Gegenwart* volume 4 pp. 1296-97.

Kunz, Lucas: *Die Tonartenlehre des Boethius* in *Kirchenmusikalisches Jahrbuch* 31 (1936) pp. 5-24.

Lambert, Benois-M: *Le Chant des Chartreux* in *Revue belge de musicologie* volume 24 pp. 17-41.

Lindley, Mark: *Pythagorean intonation and the rise of the triad* in *Royal Musical Association Research Chronicle* 16 (1980), pp. 4-61.

Lockwood, Lewis: *Music in Renaissance Ferrara 1400-1505* (Harvard, 1984).

Munxelhaus, Barbara: *Pythagoras Musicus* in *Orpheus* volume 19 (Nonn-Bad Godesberg: Verlag für Systematische Musikwissenschaft, 1976).

Nef, Walter: *The Polychord* in *Galpin Society Journal* 4 (1951) pp. 20-24.

Palisca, Claude V.: *Humanism in Italian Renaissance Musical Thought* (Yale, 1985).

Pesce, Dolores: *The Affinities and Medieval Transposition* (Indiana, 1987).

Powers, Lionel: *Mode* in *The New Grove Dictionary*, volume 12 pp. 376-450.

Reaney, Gilbert: *The Musical Theory of John Hothby* in *Revue belge de musicologie* 12 (1988).

Reckow, Fritz: *Character* in *Handwörterbuch der Musikalischen Terminologie, Archiv Für Musik-Wissenschaft* (Wiesbaden, 1970).

Riemann, Hugo: *Geschichte der Musiktheorie* (2nd edition, Berlin, 1920).

_____ : translated into English by Raymond Hagg as *History of Music Theory* (New York, 1974).

Ripin Edwin M: *Clavichord* in *The New Grove Dictionary* volume 4 pp. 458-468.

Seay, Albert: *Ramos de Pareia* in *The New Grove Dictionary* volume 15 pp. 576-77.

Simon, Kate: *A Renaissance Tapestry* (New York, 1988).

Swerdlow, Noel: *Musica Dicitur A Moys, Quod Est Aqua* JAMS 8 (1967).

Woodward, W. H: *Vittorino da Feltre and Other Humanist Educators* (Cambridge, 1897).

_____ : *Contributions to the History of Education During the Age of the Renaissance* (Cambridge, 1906).