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REDEMPTION AND RETROSPECTION IN JACQUES DE LIÈGE'S CONCEPT OF CADENTIA

Jacques de Liège was the first theorist to use the word cadentia in relation to harmonic theory, preceding later such uses, as far as survivals attest, by a century and a half. The concept he developed under this term (set out in Speculum musicae, IV. 1) has been connected in recent times to ideas in fourteenth- and fifteenth-century discant theory now related to the notion of directed progression. While there are linguistic similarities in Jacques's exposition to that of this (mostly later) theory, there are also important discrepancies in the concept's content; and there is an ideological anomaly in viewing Jacques as the exponent of an important idea of Ars nova harmonic theory. This article proposes a different reading of the concept, one congruent with Jacques's conservative intellectual stance. It identifies two contrasting, though complementary, aspects within it, and examines the role of an expression of approximation (ea, quae prope sunt, sunt quasi idem) whose ultimate significance remains uncertain. What emerges clearly, however, is that Jacques regarded cadentia as a process whereby imperfect concords were redeemed for perfection, so that their presence in polyphonic music might be tolerable in an aesthetics of retrospection. His account of polyphony draws upon an established idea in mensural theory dating back at least to John of Garland; and it contrasts significantly with the contemporaneous but more modern account of Marchetto of Padua's Lucidarium.

Among the many interesting features of Jacques de Liège's *Speculum musicae* (1320s) is its definition of the term *cadentia* in reference to harmonic progression.¹ Frederick Hammond's article on the author for the *New Grove*

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The following abbreviations have been used:

CSM	Corpus Scriptorum de Musica
<i>New Grove</i>	<i>The New Grove Dictionary of Music and Musicians</i> , ed. S. Sadie (London, 1980)
<i>New Grove II</i>	<i>The New Grove Dictionary of Music and Musicians</i> , 2nd edn, ed. S. Sadie and J. Tyrrell (London and New York, 2001)
SM	<i>Speculum musicae</i>
TML	Thesaurus Musicarum Latinarum

¹ The term 'harmonic progression' is used here to refer to any progression between chords of two or more notes each. The expression 'directed harmonic progression' (or 'directed progression' for short) is used to refer to any such progression which appears to proceed according to an aesthetic effect of inevitability, meaning in part that the second chord is directly implied by the first.

Dictionary of Music and Musicians signalled the interest of this concept,² referring to it, perhaps misleadingly, as ‘cadence’. Since then several authors have cited it as a medieval witness to the notion of directed musical motion (the ‘directed progression’), by which an imperfect interval (a third or sixth) implies resolution to a perfect interval (a unison, fifth or octave) following.³ Such an interpretation appears to follow from Jacques’s account of imperfect concord⁴ ‘striving’ towards adjacent perfect concord, which seems very much like a description of harmonic progression directed from one chord to another;⁵ and the linguistic similarities between Jacques’s exposition of the concept and later writings seem to attest a continuing tradition of musical thought of which he was a part.⁶ Yet the absence of the word *cadentia* in this sense from these other writings is odd if Jacques was indeed part of the same tradition as they; and his well-known opposition to the stylistic and theoretical developments of the *Ars nova* makes him unlikely as a conduit for one of its striking new ideas.

This article challenges the connection that has been made between Jacques’s *cadentia* and the theory of the ‘directed progression’ as this was adumbrated in fourteenth- and fifteenth-century music theory. It argues instead that *cadentia* served a purpose in Jacques’s treatise entirely congruent with his intellectual stance overall. Rather than seeking to explain or describe the seemingly inexorable passage of one chord to another, he presented a solution to the metaphysical problem of imperfection as it concerned the harmonic dimension of polyphonic music. The concept thus related to the polemic of his treatise’s famous seventh book. *Cadentia* comes near the end of Jacques’s lengthy discussion of concord that

² F. Hammond, ‘Jacques de Liège’, in *New Grove*, ix, pp. 453–5. The reference to ‘cadence’ remains in the revised version of the article in the dictionary’s more recent edition: F. Hammond and O. B. Ellsworth, ‘Jacobus of Liège’, in *New Grove II*, xii, pp. 734–6.

³ S. Fuller, ‘Tendencies and Resolutions: The Directed Progression in *Ars Nova* Music’, *Journal of Music Theory*, 36 (1992), pp. 229–58, at 230; J. Bain, ‘Fourteenth-Century French Secular Polyphony and the Problem of Tonal Structure’ (Ph.D. diss., New York University, 2001), pp. 73–4; D. Cohen, ‘“The Imperfect Seeks its Perfection”: Harmonic Progression, Directed Motion, and Aristotelian Physics’, *Music Theory Spectrum*, 23 (2001), pp. 139–69, at 161 and 164. Margaret Bent has sought to distance Jacques’s term *cadentia* from the phrase ‘directed progression’: M. Bent, *Counterpoint, Composition and Musica Ficta* (New York and London, 2002), pp. 13–15.

⁴ Jacques’s distinction between consonance (*consonantia*) and concord (*concordia*), discussed below, is maintained throughout this article when discussing his theory.

⁵ See in particular the third paragraph of the chapter. The chapter is given with a translation in App. 1 for reference during this discussion. Letters have been added in the translation of paragraph 4 to aid the discussion of App. 2. The text and all other citations from the treatise are taken from Jacques de Liège, *Speculum musicae*, ed. R. Bragard, 7 vols. (CSM 3; Rome, 1955–73). Citations of this work give first the book and chapter numbers of the text then the volume and page numbers of the edition. Translations of this and all other cited texts are by the present author except where otherwise stated.

⁶ See e.g. passages cited in Sarah Fuller, ‘On Sonority in Fourteenth-Century Polyphony: Some Preliminary Reflections’, *Journal of Music Theory*, 30 (1986), pp. 35–70, at 44.

forms the latter part of the fourth book of *Speculum musicae*. Concord was a concept with an aesthetic grounding; and so *cadentia* too related to an aesthetic conception of polyphony, one that had developed in the thirteenth century and was distinctly different from that of the new musical order emergent at the beginning of the fourteenth.

THAT JACQUES'S NOTION OF *CADENTIA* IS NOT A THEORY
OF DIRECTED MUSICAL MOTION

There is much in Jacques's chapter that resembles the concept of the directed progression, so it is necessary first of all to establish the respects in which *cadentia* runs short of this. David Cohen has identified the theory of directed progression as emerging in the fourteenth century from the assimilation of the Aristotelian account of natural motion, via scholastic transmission, into music theoretical discussions of harmonic intervals and their use in polyphony. He proposes five general elements to the idea:⁷

1. a basic distinction between perfect and imperfect intervals;
2. a principle stating that imperfect intervals 'tend towards' or 'seek' perfect ones;
3. a principle stating that (2) holds because the imperfect intervals are imperfect;
4. a principle stating that (2) holds by nature;
5. a principle (usually implicit) stating that an imperfect interval tends towards a specific perfect interval (its own perfection).⁸

The first of these was widely recognised in the thirteenth century; and the fifth, as a general proposition about the tendency of imperfect things to perfect ones, was extensively cited in thirteenth-century writings outside the sphere of music theory, being taken up there only in the fourteenth century.⁹ Cohen illustrates the coalescence of these with the other three as a coordinated idea through an examination of Marchetto of Padua's *Lucidarium*, arguably the earliest treatise to expound it. Aspects of the theory in this work are complicated (as will be discussed below), and a neater example to set in direct comparison with Jacques's chapter can be found in Ugolino of Orvieto's *Declaratio musicae disciplinae* (c. 1430), which is also cited by Cohen. The sixth chapter of the second book follows similar

⁷ Cohen, "The Imperfect Seeks its Perfection", 146.

⁸ It would follow logically from this that imperfect consonances ought to be named as imperfect forms of the perfect consonance to which they pertain: thus a major sixth would be an imperfect octave. No doubt the weight of tradition would have lain heavily against any move to reform theoretical terminology in this way, had such been at any stage contemplated.

⁹ Cohen, "The Imperfect Seeks its Perfection", 146–8.

content and plan to Jacques's, beginning with a general statement and then illustrating that with specific cases. Ugolino's general statement is as follows:

By nature, that which is imperfect and incomplete, tending to that from which it is deficient, is compelled to move so that it has perfect form; and as the aforementioned imperfect consonances, or dissonances, are imperfect in the comparison of consonances and do not have their perfection, each longs ardently to go towards it, so that it may be resolved to belong to perfect consonance. Certainly these things have been observed by expert theorists through experience, because if the placement of notes is at a third, sixth or tenth, there is no repose, but rather whichever it may be it is moved compulsively so that it should be joined to its perfection. And hence it is that any mensurally regulated cantus closes with a perfect consonance, although from time to time before the final end one has to close on an imperfect consonance, or dissonance, at which, because the well-ordered ear of the listener is not quieted, the last consonance is adjudged to be the end.¹⁰

This passage clearly presents all five of Cohen's elements for the concept of directed progression. It goes even a step further by specifically identifying this process as a movement and by recognising that subordinate cadences on imperfect chords are less satisfying to the listener than final cadences on perfect chords, thereby aligning a natural movement from imperfection to perfection with the effect of progression in the music, one in which the end may be sensed before it arrives.

Following this passage, Ugolino exemplifies the progression of imperfect intervals to perfect ones, discussing the minor third passing to unison, the major third to perfect fifth, the major sixth to octave, the tenth to octave or twelfth (depending on whether it is major or minor), the thirteenth to double octave and the seventeenth to double octave or nineteenth (depending again whether it is major or minor). He mentions but rejects progressions of the sixth to fifth and of the thirteenth to twelfth. Each progression that he accepts is, then, unitary, one imperfect interval leading to one perfect interval, with the sole exception of the minor third, which, seemingly as an afterthought and without discussion, he adds in progression by similar motion to the fifth. Ugolino's is, thus, very nearly a doctrine of directed

¹⁰ 'Natura, quod imperfectum est et incompletum, ut perfectam habeat formam ad id tendens quo deficit moveri compellitur, cumque consonantiae imperfectae seu dissonantiae praedictae consonantium comparatione imperfectae sint, et ipsarum perfectionem non habeant unaquaeque ut inesse consonantis perfectionis constituatur, eam natura gliscit adire. Expertis theoricae peritis haec indubie nota sunt, quia si vel in tertia, sexta vel decima sit vocum positio non fit quies, sed quaelibet ut suae copuletur perfectioni ad eam coacta movetur. Et hinc est quod cantus quilibet mensura ordinatus in perfecta consonantia finem habet, quamvis ante finem ultimum quidam in imperfectis consonantiis seu dissonantiis interdum habeat terminari in quo quia audientis bene disposita auris non quiescit, ultimus consonans finis addicitur.' Ugolino of Orvieto, *Declaratio musicae disciplinae*, ed. A. Seay, 3 vols. (CSM 7; Rome, 1955–61), ii, p. 12.

progression. In any case, it is as close as any single theorist came to formulating the idea and may be regarded as a classic statement of it.

Jacques's definition is less straightforward:

Cadentia, as far as it concerns the present matter, seems to refer to a certain order or a natural inclination of a more imperfect concord to a more perfect one. For it seems that an imperfect thing naturally inclines to a more perfect one, as if towards better being, and what is feeble wishes to be sustained by a thing that is stronger and stable. Therefore *cadentia* is said to be in consonances, when an imperfect concord strives to reach a more perfect concord next to it so that it falls into it and is joined to it below and above, namely by descending or ascending [progression]. (Appendix 1, paragraphs 2 and 3)

The first, second and fourth of Cohen's conceptual elements are present; but the third is not, as imperfect things are said to incline to perfect things not because they are imperfect but because they are weak and unstable.¹¹ Nor is there any statement that the imperfect thing seeks its proper perfection, even though this adage was known to Jacques and cited by him later in the treatise;¹² and while Cohen allows that this principle may be implicit, it is far from clear that it is in this case, given the examples of *cadentia* offered in the chapter's fourth paragraph.

Jacques illustrates *cadentia* with a substantial list of concords seeking greater perfection that is much longer and more inclusive than that given by Ugolino. It includes intervals that other fourteenth-century theorists excluded from polyphonic composition (the tone, perfect fourth, minor seventh and the octave compounds of the first two of these). There is a question to be answered of how exactly these descriptions are to be understood, and this is considered in Appendix 2; but even the most restricted interpretation does not illustrate the notion of directed motion, as the progressions of the fourth, fifth and octave to unison, of the ninth to fifth, of the fifth, eleventh and twelfth to octave and of the twelfth to double octave can be realised in several different ways even on an assumption of contrary motion; and alternative continuations are specified for progressions from the fourth, fifth, sixth, seventh, ninth, major tenth, eleventh and twelfth. The examples give the impression that Jacques was attempting to identify all the progressions from more imperfect to more perfect concords that could be foreseen within the contrapuntal style of music at the time, given the constraints upon the melodic progression of the individual voices. He was illustrating the possibilities rather than specifying what should in

¹¹ The instability of imperfection is raised again towards the end of the treatise as part of the criticism of the new style. *SM VII*. xlviij; vol. vii, pp. 93–5.

¹² 'For a thing naturally desires its perfection, it tends naturally from the imperfect to the perfect; for all things desire what is good, and flee what is bad and imperfect.' ('Appetit enim res naturaliter suam perfectionem, tendit naturaliter de imperfecto ad perfectum; omnia enim bonum appetunt, malum et imperfectionem fugiunt.') *SM VII*. xxxviii; vol. vii, p. 77.

any instance be the case, as suits the harmonically diverse style of the *Ars antiqua motet*. It is clear from what he says in the seventh book of the treatise that he thought that the lines of good discant should have independent movement and melodic beauty.¹³ Harmonic diversity is liable to arise from music that emphasises such features.

What is significantly absent from Jacques's chapter but which is more than once present in Ugolino's is the concept of movement. The falling implicit in *cadentia* itself is a sort of movement, of course, though one of a particular sort.¹⁴ Unlike Ugolino, Jacques does not speak of nature compelling the imperfect thing to move to the perfect one but rather of its being sustained by the perfect thing.¹⁵ The idea is quite different. It might

¹³ 'Since therefore a discant by its nature should concord with the tenor or tenors, it will be so much more perfect when it uses more perfect concords. However as long as it has been properly composed, because not always, not too often is a good, better or even best concord used, but by turns now one, now another, according to a way suitable for its melody. And the discant should not always ascend when the tenor ascends or descend when it descends, but rather ascend when it descends and descend when it ascends; it is allowed now and then in appropriate places, where the beauty of the melody permits, that the discant may descend with the tenor or ascend with the same. For much attention should be paid so that the beauty of its melody is served ... [NB. Similar motion is specifically allowed here.]

But I say this in general that, just as form gives being, and good and perfect form gives good and perfect being to appropriate matter, so a good arrangement of voices concurring with each other makes good, effective discant, so that he is an expert and discerning discantor or composer of discants who knows the natures of consonances and in what way they should be ordered in discants, which ones are more appropriate at the beginning, which in the middle, and which at the end, and in what way they should be varied alternating between lower and upper voice parts. He should consider this and many other things sought for good discant and observe the end, that there is melody and entertainment for the ears coming forth and arising from discant.'

(*Cum igitur discantus de natura sua concordare debeat cum tenore vel tenoribus, tanto perfectior erit quanto perfectioribus utitur concordis. Dum tamen fuerit convenienter compositus, quia non semper, non nimis saepe utendum est una concordia bona, meliore vel etiam optima sed alternatim nunc una, nunc altera secundum modum ipsius cantus aptum. Nec debet semper discantus ascendere cum tenor ascendit vel descendere cum descendit, sed potius ascendere cum descendit et descendere cum ascendit, licet inter in locis aptis, ubi permittit pulchritudo cantus, possit discantus cum tenore descendere vel cum eodem ascendere. Multum enim est attendendum ut ipsius cantus servetur pulchritudo. ... Sed hoc in generali dico quod, sicut forma dat esse, et bona et perfecta forma supra debitam materiam bonum et perfectum esse, sic bona ordinatio vocum concordiam inter se habentium bonum facit discantum efficientem, ut est peritus et discretus discantator vel discantium compositor qui novit consonantiarum naturas et qualiter in discantibus debeant ordinari, quae aptiores sint in principio, quae in medio, quae in fine, qualiter alternatim sub et supra variari debeant. Haec et alia multa ad bonum discantum requisita consideret et observet finalem, ut est ex discantu proveniens et consurgens melodia auriumque recreatio.*) *SM VII. v; vol. vii, pp. 12–13.*

¹⁴ The language for describing 'falling' in Latin texts of the period was predictably straightforward, as in Roger Bacon: 'it is said that by falling a thing is moved to a place and rests in the place ...' ('dicitur quod per cadentiam movetur res ad locum et quiescit in loco ...'). *Opera hactenus inedita Roger Baconi*, fasc. 13, *Questiones supra libros octo physicorum Aristotelis*, ed. F. M. Delorme and R. Stelle (London, 1935), p. 409. Jacques's chapter offers nothing that corresponds to or is dependent upon an idea of this sort.

¹⁵ The absence of such a formulation in the chapter itself is the more telling given that a suitable expression of the idea can be found in the chapter on motion in the first book: 'Therefore

be conceived by analogy with a book on a shelf leaning against and thus being propped up by a bookend. There is no movement between the two as they are in a stable equilibrium (the bookend sustains the book in a vertical position); yet the book is 'falling' towards the bookend in the sense that if the bookend were moved away, the book would fall. The falling in the book is potential, not actual. So while Ugolino views polyphonic music as being naturally propelled by the progression of imperfect to perfect concords, for Jacques polyphonic music passes through unstable and stable states, the stable ones sustaining the unstable ones. He does not suggest that the passage of the music is motivated by these states.

Although *cadentia* in its raw sense indicates a kind of movement, and the verb *cado* had been used since at least the eleventh century to refer to descent in a musical line,¹⁶ Jacques makes no connection between its falling and effects of musical movement, as is apparent from the awkward juxtaposition at the end of the third paragraph, where he states that *cadentia* occurs when an imperfect concord 'falls into [a perfect concord] ... by descending or ascending [progression]'. In the examples of the fourth paragraph of the chapter, there are some that use just descending motion, but others that use just ascending motion, and a majority that use both at the same time. In terms of actual musical motion, *cadentia* meant at least as much ascending as descending motion, and with the double-leading-note 'cadence' common in three-voice counterpoint at the time, twice as much.

This difference between the direction of the interval progressions and the descending motion inherent in a notion of falling is not a trivial one. The size and direction of melodic progressions is the subject of a detailed examination in the sixty-ninth chapter of the sixth book, where the concept of musical movement is explicitly introduced through what Jacques presents as a quotation from Guido (though it is, in fact, closer to a statement in the Anonymous *Expositio de motu*): 'Music is the motion of notes and consists in quantity, because [the motion is] in the number of notes joined together.'¹⁷ As presented, the idea of motion is one of changing quantity, specified by the sizes of intervals between consecutive notes in a

motion is a certain imperfect state of the mobile thing itself according to which the mobile thing is in potential and tends towards a more perfect state, whether in regard to natural or artificial things.' ('Est igitur motus actus quidam ipsius mobilis imperfectus secundum quem mobilem est in potentia et tendit ad actum perfectiorem sive in naturalibus, sive in artificialibus.') *SM I*. xxiii; vol. i, p. 73.

¹⁶ *Lexicon musicum Latinum mediæ ævi*, ed. M. Bernhard, fasc. 3 (*authenticus-canto*) (Munich, 1997), p. 281. The later applications of the word referring to closure (mentioned in n. 25 below) seem like specific limitations of this more general use.

¹⁷ 'Musica ... est motus vocum consistitque in quantitate, quia in numero vocum simul iunctarum.' *SM VI*. lxxviii; vol. vi, p. 191. Compare J. Smits van Waesberghe, 'De commentator anonymus in Micrologum Guidonis Aretini en zijn verhouding tot de Luiksche muziekschool', in *Muziekgeschiedenis de Middeleeuwen* (Tilburg, 1936–46), i, p. 154.

melody, as assessed by the numbers of notes included within its intervals. It corresponds to the first of the three types of motion that Jacques identifies in the chapter on motion, which forms part of an extended discussion of the nature of sound in the first book of the treatise: quantitative, qualitative and local.¹⁸ Quantitative motion consists in a change of size, whether an increase (*motus augmenti*) or decrease (*motus detrimenti*). So the musical motion is described in terms of the increase or decrease of melodic interval in the melodic line. Implicitly the music is understood as a substance that is getting bigger or smaller through time.¹⁹

In fact this view is not strictly maintained, as the ensuing discussion of ascending and descending intervals suggests a covert change to an idea of local motion. Such inconsistency may be indicative of uneasiness on Jacques's part with the metaphor of musical movement, if not as a description of musical effect, as an intellectual conception. His adoption of the 'Guidonian' definition is rhetorical rather than assertive:

Surely the progression from one note to another is a sort of movement? Surely ascent and descent are sorts of movement? And these relate to unequal [i.e. distinct in pitch] notes, since one ascends from *re* to *mi*, or by the reverse descends; and similarly between all conjunctions of unequal notes there is ascent or descent; and since there could be motion which neither ascends nor descends, as that which is in the same space, the progression that is between equal notes is not entirely free from motion.²⁰

Jacques does not defend or explain the idea, but merely invites the reader to accept it. Yet the rhetorical mode admits a degree of uncertainty. He was rightly troubled by the problem of unison movement, which does not fit in with the quantitative view.²¹ The concept of melodic motion itself

¹⁸ *SM* I. xxiv; vol. i, pp. 74–5.

¹⁹ Such is congruent with the general theory of motion in the Middle Ages; see J. A. Weisheipl, 'The Interpretation of Aristotle's Physics and the Science of Motion', in N. Kretzmann, A. Kenny and J. Pinborg (eds.), *The Cambridge History of Later Medieval Philosophy* (Cambridge, 1982), pp. 521–36.

²⁰ 'Nonne processus ab una voce ad aliam motus quidam est? Nonne ascensus et descensus quidam motus sunt? Et hi ad inaequales pertinent voces, cum quis ascendit de *re* in *mi*, vel e converso descendit; et consimiliter in omnium inaequalium vocum coniunctionibus ascensus est vel descensus; et cum possit esse motus qui nec ascensus, nec descensus est, ut ille qui est in spatio aequali, non est omnino expers motus processus qui inter voces est aequales.' *SM* VI. lxxviii; vol. vi, p. 191.

²¹ He makes two further allusions to the problem of the unison without resolving it. The first is near the end of the chapter: 'And so in singing carefully, one produces often and more often the varied melodies of notes simple and mixed according to arsis and thesis that have been touched on, but he should not neglect to sing appropriately in their places restruct or same-sounding notes and for the first time in the joints of the [Guidonian] hand in which boys are initially trained.' ('Diligenter igitur cantando, saepe et saepius proferat quis tactas varias vocum simplicium et mixtarum secundum arsim et thesim modulationes, nec ignoret voces repercussas seu unisonantes suis in locis convenienter decantare et primitus in manus iuncturis in quibus pueri primo instruuntur.') *SM* VI. lxxviii; vol. vi, pp. 198–9. The other occurs in the next chapter: 'And song can thus be described more generally: "Song is the appropriate

poses problems: what substance is getting bigger or smaller or changing through this motion – or, in the case of local motion, moving from place to place? How could an idea of pitched motion be reconciled with the temporal motion embodied in mensural concepts? The metaphor of musical movement remains difficult to extrapolate in its specifics,²² and so we need not be surprised to discover that the problem had not been resolved in the fourteenth century. We can sense in what Jacques says that while he acknowledges the aesthetic experience of musical movement he recognises intellectual difficulties with the concept.

Jacques's chapter on *cadentia* does not present all the aspects essential to the idea of the 'directed progression' as these are contained in the classic articulation by Ugolino of Orvieto. Nor do the interval successions with which he illustrates his concept support the view that he had in mind a kind of harmonic motion in which the second term was specifically implied in the first. Indeed, the idea of musical motion is not overtly mentioned in the chapter, and his comments on it later in the treatise suggest that it was one he was happier to use than to expound. In any case, there is a clear difficulty in reconciling the descending motion implicit in the concept of *cadentia* with the types of musical motion that he allies to it. Even where the concept of falling is applied to harmonic progression elsewhere in *Speculum musicae*, it appears that the 'descending' invoked applies to some other quality associated with a progression that does not instantiate it in any unambiguous way. Given that Jacques chose and formulated the term *cadentia* for harmonic progression, there must have been a specific purpose to his choice. What this was will emerge from an exposition of what Jacques intended by *cadentia*, his motivation for the idea, and the context in aesthetic thought to which it related.

performance of distinct notes; singing is joining together distinct notes appropriately." And, according to this, the unison, which requires distinct, though equal, notes, not inflected by arsis and thesis, is not excluded from song, when someone sings *re re re re* in crying aloud. Surely birds, certain fish and crickets sing? They seem to sound the unison for the most part. And a tenor, which is made purely from repercussions, that is with equal notes sounding the same, is called a song. So the unison should not be excluded from song, just as it is not segregated from the number of the consonances, as was seen above in the second book.' ('Potest autem cantus generalius sic describi: "Cantus est apta vocum distinctarum prolatio; cantare est voces distinctas apte coniungere." Et, secundum hoc, unisonus qui voces requirit distinctas, aequales tamen, non per arsim et thesim inflexas, a cantu non excluditur, cum quis vociferando dicit *re re re re*. Nonne aves, pisces quidam et cicada cantant? Et tamen unisonare saltem maiore ex parte videntur. Et tenor, qui ex puris confectus est repercussis idest vocibus aequalibus et unisonantibus, cantus quidam dicitur. Non igitur unisonus excludatur a cantu, sicut nec a numero consonantiarum, sicut supra libro secundo visum est, secluditur.') *SM VI*. lxx; vol. vi, p. 200.

²² Modern philosophy explains it through a concept of 'double intentionality', a distinction between the sounds that are literally heard (which do not move) and what is heard in them (a musical movement). R. Scruton, *The Aesthetics of Music* (Oxford, 1997), pp. 1–96; id., 'Musical Movement: A Reply to Budd', *British Journal of Aesthetics*, 44 (2004), pp. 184–7.

CADENTIA IN MUSIC THEORY

The word *cadentia* itself is an essential element of Jacques's theory, and a historical assessment of its use in music theory provides a necessary context for an exposition of that theory. In referring to *cadentia* in Jacques's treatise as 'cadence', Frederick Hammond was, of course, correctly marking both the Latin word as the origin of the modern term and Jacques's use of it as the earliest surviving in connection with harmonic progression. There is nothing, however, in Jacques's exposition of the concept that restricts the phenomenon to formal or stylistic instances that we should now think of as cadential. His reference in the sixth paragraph of the chapter to endings of *organa* and discant is exemplary of particular incidences of *cadentia* (in his understanding), but he says nothing to indicate that they represent the typical or exclusive case. Moreover, it is important to note the isolation of Jacques's usage of the word. The next surviving text to use it in a similar connection is the *Liber musices* of Florentius de Faxolis, dated well over a century and a half later, in the years 1485–92.²³ The final chapter of the second book (18, mislabelled 17 by the scribe, entitled *De neuima et cadentia*) introduces the term *cadentia* in relation to polyphony, though the author cites only the *superius* voice in his examples.²⁴ *Cadentia* is owned there as a term borrowed from the vernacular and presented as the mensural synonym for *neuima*, which is discussed in relation to non-mensural music.²⁵ A quarter of a century or so after Faxolis, Aaron presented an extensive discussion of *cadentia* in the second half of the third part of his *De institutione harmonica* (1516), and there is no doubt here that the term applies to harmonic formulae in polyphony that we would now recognise as

²³ A. Seay, 'The "Liber Musices" of Florentius de Faxolis', in *Musik und Geschichte: Leo Schrade zum sechzigsten Geburtstag* (Cologne, 1963), pp. 71–95, at 88–90. E. E. Lowinsky, 'Ascanio Sforza's Life: A Key to Josquin's Biography and an Aid to the Chronology of his Works', in E. E. Lowinsky and B. J. Blackburn (eds.), *Josquin des Prez* (London, 1976), pp. 31–75, at 48. The date has now been refined to 1485–92 in *Florentius de Faxolis, Book on Music*, ed. B. J. Blackburn and L. Holford-Strevens (The I Tatti Renaissance Library, 43; Cambridge, Mass. and London, 2010), p. x.

²⁴ *Florentius de Faxolis, Book on Music*, ed. Blackburn and Holford-Strevens, pp. 156–9 and 285–6, nn. 104–5. *Cadentia* has already been fleetingly mentioned in the treatise when dealing with counterpoint (Book II, ch. 14), *ibid.*, 144.

²⁵ The linguistic register of the word *cadentia* and its musicological uses are illuminatingly discussed by L. Holford-Strevens, 'Humanism and the Language of Music Treatises', *Renaissance Studies*, 15 (2001), pp. 415–49, at 430. Faxolis's use of the term should be set against a more or less contemporaneous one in Jean Le Murerat's *De moderatione et concordia grammaticae et musicae* (1490), ed. in Don Harran, *In Defence of Music: The Case for Music as Argued by a Singer and Scholar of the Late Fifteenth Century* (Lincoln, Nebr. and London, 1989), p. 98. The word appears just once there in a discussion of the relationship between words and music in chant, seeming to mean melodic cadence. Instances of the verb *cado* to mean 'finish' (i.e. make a cadence in the modern sense) can be found in Lambertus's *Tractatus de musica* of the 1270s and Engelbert of Admont's *De musica* of the early fourteenth (Lexicon musicum Latinum mediæ aevi, ed. Bernhard, fasc. 3, pp. 281–2). Presumably Le Murerat was drawing on parlance of this kind.

cadential.²⁶ The two-voice schemata that he discusses are the sixteenth-century ancestors of the modern cadence. The term *cadentia* is not defined, which suggests that Aaron assumed his reader was to be already familiar with it, presumably from vernacular use, as Faxolis testified earlier.

Stephano Vanneo's *Recanetum de musica aurea* from a couple of decades later also presents an extensive discussion of *cadentia*, somewhat indebted to Aaron's. It does, though, present a definition (the earliest extant) of *cadentia*, one that is clearly an ancestor of the modern concept of cadence:

And so a *cadentia* is a small segment of some part of a *cantus* at the end of which either a general pause or a perfection is obtained. Either *cadentia* is general [i.e., simultaneous in all voices], or a perfection is attained. Or a *cadentia* is a certain ending of a part of the song itself, just as in the context of oration there is a medial punctuation and a final punctuation. And learned musical experts strive to ensure that the end of *cadentiae* occurs where either the part of the oration or its clause finishes.²⁷

There is a point of contact with Jacques de Liège in that the attainment of perfection (*perfectio reperitur*) may be a characteristic of *cadentiae*. This formulation is not indebted to Jacques, however, and there is no reason to think that Vanneo was acquainted with his theory.

Jacques's use of the word *cadentia* was both original and not directly related to the later tradition that we have inherited; so in assessing it, no preconceptions born of later usage should be brought to bear. The comparative novelty of the word itself at the time Jacques took it up must be borne in mind. Originally a neuter plural form of the participle (*cadens*) of *cado* (I fall), the Latin word *cadentia* was only adopted as a substantive in the late Middle Ages. It has been found employed in three different ways by writers of the thirteenth century: in the simple sense of falling in physical movement, as a technical term in regard of accident and inflection in grammar, and as a technical term in regard of rhythm in poetry.²⁸ If the modern word 'cadence' has lost its connection with the

²⁶ P. Aaron, *Libri tres de institutione harmonica* (Bologna, 1516; repr. New York, 1978), sigs. Giiii^v–Hiiii^r.

²⁷ 'Cadentia igitur est, cuiuslibet partis cantus particula, in fine cuius, vel quies generalis, vel perfectio reperitur. Vel Cadentia est generalis, vel perfectio reperitur. Vel Cadentia est quaedam ipsius Cantilenaе partis terminatio, perinde atque in orationis contextu Media distinctio, atque Distinctio finalis. Studentque periti Musici, ut Cadentiarum Meta fiat, ubi et orationis pars, seu membrum terminat.' S. Vanneo, *Recanetum de musica aurea* (Rome, 1533; repr. Bologna, 1969), fols. 85^v–86^r. Vanneo's definition of *cadentia* is dependent on that given by Tinctoris for *clausula*: 'Clausula est cuiuslibet partis cantus particula in fine cuius vel quies generalis vel perfectio reperitur.' Johannes Tinctoris, *Diffinitorium musicae: Un dizionario di musica per Beatrice d'Aragona*, ed. and trans. Cecilia Panti (Florence, 2004), p. 10.

²⁸ Quotations from Roger Bacon for the first two senses and from Johannes de Garlandia for the third are given by *Dictionary of Medieval Latin from British Sources*, ed. R. E. Latham, fasc. II C (London, 1981). A quotation using the term in the first sense from Paulus Sanctinus Ducensis in a source of 1330 or 1340 is given in C. de Fresne, D. P. Carpenter and G. A. L. Henschel, *Glossarium mediae et infimae Latinitatis*, 10 vols. (Niort, 1883), ii, p. 14.

‘falling’ that is its root meaning, that is unlikely to have been the case in the thirteenth and fourteenth centuries, when it was new.

In fact, Jacques’s use of *cadentia* was not the earliest to occur in music theory, as he himself appears to recognise in saying ‘as far as it concerns the present matter’, implying that it applied to others too. The *Tractatus de discantu* by Coussemaker’s Anonymus II, dated sometime at the end of the thirteenth century or beginning of the fourteenth, refers to ‘bona cadentia dictaminum’ as the fourth of four requirements for good *discantus*.²⁹ The meaning here is ‘good “falling” of the words of the text [in the music setting them]’ (i.e., ‘good word setting’), and the text goes on to specify the alignment of long syllables with long notes and of short syllables with short notes. The expression recurs derivatively in the *Tractatus de musica mensurata et musica falsa seu ficta secundum complures scriptores*³⁰ and towards the end of the fifteenth century in Franchino Gaffurius’s *Extractus parvus musicae* and Guillaume Guerson’s *Uitillissime musicales regule*.³¹ These instances attest a continuous tradition of using the term; and as it is nowhere defined or expounded, nor in any of these cases does it merit more than a single mention, its sense must have been obvious in the context, and may have reflected the way in which musicians talked about fitting words to music.³²

When Jacques appropriated the word, *cadentia* was a neologism with a variety of current applications, including another in the domain of music theory. He was the first to define the word in a music theoretical context, but his definition appears to have found no adherents, at least as far as surviving sources attest. In any case, *cadentia* was for Jacques a general concept, not, as it was for late fifteenth- and sixteenth-century writers, a specific musical object.³³ *Cadentia* in his understanding was

²⁹ *Anonymus II, Tractatus de discantu*, ed. A. Seay (Colorado Springs, Colo., 1978), p. 32.

³⁰ TML: ANOUPS2. See C. A. Moberg, ‘Om flerstämmig musik i Sverige under medeltiden’, *Svensk Tidskrift för Musikforskning*, 10 (1928), pp. 67–82, at 72.

³¹ Franchinus Gaffurius, *Extractus parvus musicae*, ed. F. A. Gallo (*Antiquae Musicae Italicae Scriptores*, 4; Bologna, 1969), p. 130. Guillaume Guerson, *Uitillissime musicales Regule cunctis summopere necessarie plani cantus simplicis contrapuncti rerum factarum tonorum et artis accentuandi tam exemplariter quam practice per magistrum Guillermi Guersoni de Villalonga nouititer conpilete* (Paris, c. 1495), sig. bvi^r. The requirement of good word setting is moved to third place in the list by Gaffurius, who eliminates the third given by the other authors (which is hard to distinguish from the second).

³² Such usage seems to be echoed by Jacques de Liège in the sixth book of *Speculum musicae*, where he discusses changes that a psalm tone may undergo to accommodate the words: ‘Again it occurs whenever a monosyllabic word or another which is accented by its nature falls at the end of a mediation, and in such a case not all the notes of the mediation are observed, as appears here: [he gives a music example.]’ (‘Item accidit quandoque ut in fine mediationis cadat dictio monosyllaba vel alia quae de natura sua acuitur, et in tali casu non omnes mediationis voces observantur, ut hic patet: Deus, iudicium tuum regi da etc.’) *SM VI*. lxxxvi; vol. vi, pp. 249–50.

³³ From the surviving sources, Faxolis is the first writer to have used *cadentia* to refer unambiguously to a distinct musical object (a ‘cadentia’). Jacques always uses the word in the singular, referring (as the discussion below will argue) to an abstract idea. For him, ‘cadentia is said to be in consonances’, not to comprise them.

manifestly associated with particular kinds of harmonic progression; but his adoption of the term poses the question of what was thought to be 'falling' in them.

AN EXPOSITION OF *CADENTIA*

The two aspects

Jacques's definition of *cadentia* contains an equivocation: '*Cadentia* . . . seems to refer to a certain order or a natural inclination of a more imperfect concord to a more perfect one.' On the face of it, the alternatives here are two quite different aspects of the concept: the first, 'a certain order', places concords in sequential relation to each other, whereas the second, 'a natural inclination', indicates a condition inhering within the concord itself. Before these two aspects of the idea can be addressed, the underlying concept of concord must be considered.

The chapter on *cadentia* is the penultimate in a series of twenty-one devoted to the topic of concord and its converse, discord. Unlike many previous writers, Jacques distinguishes concord from consonance.³⁴ For him a consonance is simply any combination of two notes taken together at the same time, following the word's literal sense of 'sounding together'.³⁵ It may be distinguished quantitatively, according to the size of the interval between its combined notes, and qualitatively, depending on whether it is concordant or discordant. Jacques defines concord as a mixture of distinct sounds that gives sensory pleasure, and discord as a mixture of distinct sounds that is harsh or displeasing to the senses.³⁶ The pleasing combination of sounds in concord creates a blend which he regards as a third element.³⁷ The archetype of this blend is represented by the unison, in

³⁴ In fact, John of Garland made this same distinction; but although Jacques quotes from and refers to Franco of Cologne and Lambertus (whom he calls Aristotle), he makes no direct allusion to that author. Yet if the quotation in the 87th chapter of the second book (*SM* II, lxxxvii; vol. iia, p. 204) derives directly from Jerome of Moravia's *Tractatus de musica*, Jacques was presumably acquainted also with John of Garland's work, which is included in that treatise.

³⁵ He includes the unison in this category. *SM* II, x; vol. iia, pp. 29–34.

³⁶ 'Concord is generally taken as a mixture of distinct sounds produced at the same time that is pleasing to the senses . . . For discord is a mixture of distinct sounds produced at the same time that is harsh and displeasing to the senses.' ('Concordia generaliter sumpta . . . est sonorum distinctorum simul tempore productorum placens apud sensum permixtio . . . Est enim discordia sonorum distinctorum simul tempore productorum apud sensum dura displicensque permixtio.') *SM* IV, xxxi; vol. iv, p. 92. See also R. Crocker, 'Discant, Counterpoint and Harmony', *Journal of the American Musicological Society*, 15 (1962), pp. 1–21; S. Fuller, "'Delectabatur in hoc auris": Some Fourteenth-Century Perspectives on Aural Perception', *Musical Quarterly*, 82 (1998), pp. 466–81, at 469–73.

³⁷ 'Again, since the mixture is the union of other miscible elements, it more properly occurs between concordant notes than between discordant ones. For miscible entities do not remain in their own forms under combination but are changed; and a third [entity] arises from them

which distinct voices are indissociably united as one. Concord in general is the harmonious blend that arises between two (or more) distinct sounds standing at certain pitched intervals from one another.

As the unison represents an extreme of concord, the absolute blend of distinct sounds, other concordant consonances manifest such blend to a greater or lesser extent. Jacques ranks these hierarchically according to a scheme similar to those of John of Garland's *De mensurabili musica* and Lambertus's *Tractatus de musica*.³⁸ Both concords and discords are organised into perfect, middle and imperfect categories. Jacques further divides the perfect concords into subdivisions of 'good' or 'perfect' (*bona; perfecta*), 'better' or 'more perfect' (*melior; perfectiora*) and 'best' or 'most perfect' (*optima; perfectissima*). A complete order of concords emerges from this (Table 1) and it forms the background to the theory of *cadentia*.

The first aspect of *cadentia*, as an order of concords, relates directly to this order. In this aspect, *cadentia* comprises the relationship in which a more imperfect concord stands to a more perfect concord adjacent to it in a musical progression. The progressions that Jacques gives in the fourth paragraph of the chapter fall between the divisions of the order of concords set out in Table 1. In each case the progression is from the middle or imperfect categories to the perfect one, or within the perfect category from good to better, or from good or better to best. Aesthetically, each comprises a passage from less blended to more blended concord. In this sense, *cadentia* refers to harmonic progressions. Any 'falling' conveyed by the term is conceptual: the passage from less to more blended sonority may as well be climbing as falling.

It is unclear why Jacques does not include progressions from imperfect to middle concord (such as a tone to third, and tenth or eleventh to ninth),

which is called the mixture, as appears to be so with material elements. And in its way this occurs between concurring distinct sounds coming to the ear at the same time.' (Ideo cum mixtio sit miscibilium alteratorum unio, magis proprie locum habet in vocibus concordantibus quam in discordantibus. Miscibilia enim in mixto non manent sub propriis formis sed alteruntur et fit unum tertium ex illis quod mixtum dicitur, ut patet in materialibus elementis. Suo autem modo sic fit in concordantibus simul venientibus ad auditum distinctis sonis.) *SM* IV. xxxi; vol. iv, p. 92.

³⁸ The scheme has admirable clarity in Garland's *De mensurabili musica*: Johannes de Garlandia, *De mensurabili musica, kritische Edition mit Kommentar und Interpretation der Notationslehre*, ed. E. Reimer (Beihefte zum Archiv für Musikwissenschaft, 10–11; Wiesbaden, 1972), i, pp. 67–72. Lambertus's formulation is difficult to construe because of corruptions in the text. The octave, fifth and fourth, together with their octave compounds, constitute respectively the perfect, middle and imperfect concords. The sixths are imperfect discords, the thirds are middle and the tone, semitone and tritone are perfect. No mention is made of the sevenths. *Scriptores de musica mediæ ævi*, ed. E. de Coussemaker, 4 vols. (Paris, 1864–76), i, p. 260; see also S. Fuller, 'Organum – discantus – contrapunctus in the Middle Ages', in T. Christensen (ed.), *The Cambridge History of Western Music Theory* (Cambridge, 2002), pp. 477–502, at 485–7.

Jacques de Liège's Concept of *Cadentia*

Table 1 *Jacques de Liège's order of concords (SM IV. xxxiii–xxxvii)*

	Perfect	Middle	Imperfect
in use	<i>Best/most perfect</i> unison <i>Better/more perfect</i> octave double octave (very rare) <i>Good/perfect</i> fifth twelfth fourth	minor third major third major ninth	tone major sixth minor seventh minor tenth major tenth eleventh
not in use	nineteenth triple octave major twenty-third	major sixteenth major seventeenth eighteenth minor twenty-first	major thirteenth minor fourteenth minor seventeenth major twentieth

NB. Fourth, fifth, octave and their compounds are all perfect intervals in the modern sense.

since the basis of *cadentia* is the 'inclination of a more imperfect concord to a more perfect one', which is to say progression between comparative not absolute qualities of concord. Indeed the function of the category of middle concord is unclear, as Jacques is unable to distinguish it in general terms from imperfect concord.³⁹

Middle concord is when notes sounded together are perceived to differ much in the hearing; however, they are pleasing to it. . . . Imperfect concord is said to occur when notes, sounded together, are perceived to differ much in the hearing, otherwise however they concord.⁴⁰

Cadentia as order, then, concerns progressions between sonorities that are perceived to be the one less and the other more concordant (which means less or more blended). In order to account for this phenomenon, Jacques has erected an unnecessarily complicated conceptual edifice of hierarchically differentiated categories. It is within the terms of this

³⁹ Jacques's scheme is more cumbersome than Garland's, in part because it does not reduce octave compounds of simple consonances to the same categories as the simple consonances themselves. Even allowing for a subtle sensibility at work here, it is unclear why, for example, the thirds should be middle and the tenths imperfect when the tone is imperfect but the ninth middle. In Garland's scheme, thirds and tenths are all imperfect. The tone and ninth are both discords; but provision is made for situations in which they may be regarded as middle, as is discussed below.

⁴⁰ 'Concordia media est cum voces simul prolatae, differe multum ab auditu dinoscuntur; placent tamen sibi . . . Imperfecta concordia tunc fieri dicitur cum voces, simul prolatae, multum ab auditu differe noscuntur, aliquid tamen concordant . . .'. *SM IV. xxxvi and xxxvii*; vol. iv, pp. 99 and 100.

framework that progressions are reckoned to be falling – not within the sound of the music, where in this regard only a contrast of sonorities can be discerned.

The second aspect of *cadentia* suggests that the more imperfect concord is in a state of ‘falling’ whether or not it abuts a perfect concord. This state is part of what it means for the concord to be imperfect. As was discussed above, Jacques’s clarification of the condition of imperfect things (in the chapter’s third paragraph) characterises them as weak and needing to be propped up by stronger (perfect) things. *Cadentia* in its second aspect ties in with this view of imperfection. Imperfect concords have a predisposition to ‘fall’ within themselves irrespective of their context. So *cadentia* in this sense is an abstract quality of particular concords. It has a perceptible correlate in the distinctness of a concord’s constituent notes; and *cadentia* as a property of an individual concord stands in parallel to the deficiency of its degree of blend by comparison with the complete blend of the unison. As regards *cadentia* as natural inclination, any ‘falling’ that might be discerned in the incomplete blend of a certain consonance is purely conceptual: the falling of imperfection into perfection. This may serve as a metaphor for instability perceived in concords owing to a lack of blend between their notes.

The two senses of *cadentia* are synthesised in the final sentence of the opening section, where the imperfect concord is said to strive, conveying the inclination in the imperfect concord itself, to attain the more perfect concord near to it, conveying the order from imperfect to perfect. It is here that Jacques’s language comes closest to that of the directed progression: for the suggestion is very strongly that an imperfect concord is falling towards and trying to reach the perfect concord following it; and both motion and direction are expressed in this idea.⁴¹ It follows from the discussion above, however, that these relate to the conception of the concords as imperfect and perfect and not to their aesthetic effects. There

⁴¹ Mention must be made also of a passage with strikingly similar language from the second book of the treatise: ‘Again, if one of two [singers] holding the extreme notes of a fifth descends and the other ascends through some [note] following, so that they are at a third, they fall into a unison, towards which they tend. They always perform a minor third, not a major one: imagine if one sings *la sol* in descending, the other *re mi* in ascending, so that they sound together and concord perfectly in *fa*, because the imperfect concord tends to the perfect; or if someone sings *sol fa*, and the other *ut re*, so that they fall into *mi* at the unison; these, in the first case and in the second, use the minor third which is between *re* and *fa* and between *mi* and *sol*.’ (‘Item si duorum diapente voces tenentur extremas per aliquam secundam unus descendat et alius ascendat, ut in tertia, in unisonum, ad quem tendunt, cadunt. Semper semiditono funguntur, non ditono, puta si quis descendendo dicat *la sol*, alius ascendendo *re mi*, ut in *fa* unisonent et perfecte concordent, quia imperfecta concordia tendit ad perfectam, vel si quis dicat *sol fa*, et alter *ut re*, ut in *mi* cadant in unisonum, illi, hic et ibi, semiditono utuntur qui est inter *re* et *fa* et inter *mi* et *sol*.’) *SM* II. lxxx; vol. iia, p. 191. Here the minor third is described as tending to the unison; and the singers themselves (metonymically for the music) are described as falling

is no musical effect (or experience) of falling or striving in them; that is part of the conceptualisation of the concords as being more or less perfect. When the tone is said to 'seek' the unison, this seeking is not within the music itself but within the domain of imperfection, to which the tone is said to belong.⁴² No grounds are given for maintaining a specifically musical effect of directed motion in it.

from a third into a unison. Moreover, it is the minor rather than the major third that is 'always' performed in singing by contrary stepwise motion from fifth to unison, suggesting that the progression is specific and directed.

While it is clear that *cado* is used here in a way directly connected with a harmonic progression, it is no more obvious than in the chapter on *cadentia* what is thought to be 'falling' in writing thus; and *cadentia* itself is at least associated with harmonic progression. The occurrences of *tendo* seem less ambiguous; but habits of thinking about directed musical motion that are now current did not exist in Jacques's day, so the significance of the locution must not be assumed. The word is used elsewhere in the treatise in connection with melodic progression to a modal final, or simply to some other specified note, without conveying any sense that the musical effect is one of fulfilling a continuation implicit in a given start. The following from the thirty-ninth chapter of the sixth book ('Concerning the final notes of the modes'; *De modorum vocibus finalibus*) is typical: 'And so it should be said that scales have final notes in the defined keys of the monochord. Otherwise, there would be a great confusion in modes or songs if they were not conclud'd by fixed ends, but could wander to indefinite final notes. And so in the same way as an end is ordained by nature for all consistent things, so in songs and scales there are defined and final notes and keys of the monochord to which all other notes of the melody itself are ordered and tend.' ('Dicendum igitur quod toni voces habent finales in determinatis monochordi clavibus. Alias, in modis vel cantibus esset magna confusio si ad certos fines determinati non essent, sed vagari possent in indeterminatis vocibus finalibus. Sicut igitur omnium natura constantium terminus positus est, sic in cantibus et tonis sunt determinatae voces et claves monochordi finales ad quas ceterae omnes ipsius cantus ordinantur atque tendunt voces.') *SM VI. xxxviii*; vol. vi, p. 95. See also vol. vi, pp. 87, 300, 302 and 328.

It seems that *tendo* indicates here an ordered melodic progression to the modal final; but there is no indication that the motion as such is predictable (i.e. directed) from any given note of the melody: such would be contrary to the nature of chant melody, and contrary to Guido d'Arezzo's account of melodic retrospection (cited below). If the sense of *tendo* here is carried over to the passage above, then, it is not so much that a particular imperfect concord necessarily implies the following perfect one, but that in practice some perfect concord always follows an imperfect one – a categorial order rather than directed motion. It may not be a very large step from here to assert that the minor third implies a particular unison following by contrary motion, but this is not one that Jacques actually takes.

In any case, the passage can be understood without reference to the concept of the directed progression. It is part of a discussion affirming the greater concordance of the minor third than the major one. To begin with, this is affirmed on the grounds that the minor third includes a tone and a minor semitone rather than two tones ('there is no complete melody from pure tones'; 'ex puris tonis nulla est integra melodia'). The progression of the minor third to a unison following a fifth is discussed, and this contributes to the argument by showing that it is the minor rather than the major third that leads to the unison. The language here is descriptive not regulative. The passage argues that the minor third is more concordant than the major one because it is used in progressing to the unison. The unison confers concord on the minor third on account of their adjacency. As will become apparent in the discussion below, the use of *cado* in this way is congruent with Jacques's concept of *cadentia* and need not be aligned with any implication of 'directedness' in the progression.

⁴² There seems to be no reason why Jacques should not have suggested that the tone might progress to the fifth, as it often does in *Ars antiqua motets* and as is exemplified by John of Garland (discussed below).

Yet there is a tension in the concept. For if *cadentia* is a matter arising in the comparison of concords, what has it to do with falling in the domain of perfection? Indeed, this reveals a tension between the senses and the intellect endemic to Jacques's definition of concord, and for that matter to the entire Pythagorean-Platonic harmonic tradition. The matter is addressed explicitly in the first book of the treatise⁴³ and surfaces again near the beginning of the section on concord in the fourth book:

Although sensation may judge some sounds to concord, others not, and, as regards concurring, it may say that some concord more, others less, and similarly in discording, sensation is not, however, the cause of concord in concurring [sounds], nor of discord in discording ones, but this stems naturally from the proportion of the miscible notes or in the proportion from the principal parts of such consonances, or by some essential or accidental causes, which even if sensation does not know them, the intellect can perceive.⁴⁴

The cases of the twelfth and the tone reveal how problematic Jacques's position is. Both of these consonances manifest high levels of perfection in the judgement of the intellect, as is demonstrated by the order of consonances that Jacques draws up 'under the way of perfection' in Book 2.⁴⁵ His order (which proceeds from left to right according to decreasing perfection) is based on the numerical properties of the ratios representing the consonances:

Unison	Octave	Twelfth	Double octave	Fifth	Fourth	Tone
1:1	2:1	3:1	4:1	3:2	4:3	9:8

Greater perfection inheres in multiple proportions (decreasing as the magnitude of the ratio increases), then in superparticular proportions (decreasing as the magnitude of the ratio decreases). Both the twelfth and tone are demoted in the order of concords, however, because both sound less perfect than their ratios seem to the intellect. The twelfth is subordinated to the double octave as a merely good, rather than a better,

⁴³ *SM I*. xxviii; vol. i, pp. 86–90.

⁴⁴ 'Quamvis autem sensus iudicet aliquos sonos concordare, aliquos non, et, quantum ad concordantes, aliquos magis, aliquos minus concordare dicat, et similiter in discordantibus, non est tamen sensus causa concordiae in concordantibus, nec discordiae in discordantibus, sed provenit hoc naturali ex proportione miscibilium vocum vel in proportione ex partibus principalibus talium consonantiarum, seu causis aliis essentialibus vel accidentalibus, quas etsi non noscat sensus, percipere potest eas intellectus.' *SM IV*. xxxi; vol. iv, p. 93.

⁴⁵ Jacques distinguishes two orders of consonances: that according to the way of perfection, which concerns form, and that according to the way of imperfection, which concerns material (and progresses by ascending order of the size of the pitch interval). He states the principle of the way of perfection thus: 'According to the way of perfection, those [consonances] are former of which the mixtures and proportions are more perfect, so that those whose sounds concord more, are united more and endured by the hearing.' ('Secundum viam perfectionis, illae sunt priores quarum mixtiones et proportiones sunt perfectiores, ut sunt illae quarum soni magis concordant, magis uniuntur et se compatiuntur apud auditum.') *SM II*. viiii; vol. iia, p. 27. The matter is taken up again closer to the chapter on *cadentia* in *SM IV*. xxiii–xxvi; vol. iv, pp. 61–5.

perfect concord; and the tone is relegated to the imperfect concords, beneath the thirds and ninth (and other concords not in use). If the ratios are the cause of perfection, then why do not the senses reckon these concords more perfect, or at least learn to subordinate impression to knowledge? If the tone is perceived as less concordant than the third, why is that perception not the cause of the imperfection that is thought to arise in that judgement?⁴⁶

The concept of perfection and the sensory perception of concord are two independent systems that have a (perhaps illusory) common origin in the unison. For the one, this is absolute simplicity of proportion; for the other this is complete blend. *Cadentia*, then, seems to address two dimensions: a conceptual order according to which less perfect ratios fall (or are in the state of falling) towards the absolute perfection of unity; an aesthetic effect of passage from less blended to more blended concord. Inasmuch as it is grounded in the aesthetic concept of concord it is associated with perceptible qualities of progression in polyphonic music, from less to more blended sonority. The metaphor latent in the concept of *cadentia* does not refer directly to such qualities, however, for nothing is falling in them. Rather, the falling is of an abstract sort.⁴⁷

'Ea, quae prope sunt, sunt quasi idem'

Paragraph 5 of the chapter on *cadentia* represents an important development of the argument. It states that an imperfect concord before a perfect one is perfected. Evidently there is some conceptual sleight of hand involved in saying that an imperfect concord is perfected by an adjacent perfect concord, as an imperfect concord is by definition not perfect; and this sleight of hand is apparent in the formula 'things that are close are more or less the same' (*ea, quae prope sunt, sunt quasi idem* – hereafter this is referred to as the 'formula').⁴⁸ The primary difficulty of the formula is what is meant by 'close'.⁴⁹ Fortunately, some commentary on this notion can be gleaned from occurrences of the formula four times elsewhere in the treatise.

⁴⁶ See the discussion in K. Falconer, 'Consonance, Mode, and Theories of *Musica Ficta*' in U. Günther, L. Finscher and J. Dean (eds.), *Modality in the Music of the Fourteenth and Fifteenth Centuries/Modalität in der Musik des 14. und 15. Jahrhunderts* (Musicological Studies and Documents, 49; Neuhausen-Stuttgart, 1996), pp. 11–29, at 15–18.

⁴⁷ The falling intended is that conveyed in a passage discussed below from the seventh book: 'no imperfection falls back or could fall truly into that highest Trinity' ('in summa illa Trinitate nulla prorsus cadat vel cadere possit imperfectio'). *SM* VII. xxx; vol. vi, p. 61.

⁴⁸ The sleight of hand is noteworthy because of the precision with which concepts of perfection and imperfection are handled in Book VII and the rigour with which they are distinguished.

⁴⁹ It may be tempting to understand 'close' here as a requirement for voice-leading proximity, an idea central to Marchetto of Padua's theory (discussed below). The examples of *cadentia* (discussed in App. 2) suggest that this cannot be so. For Jacques, the principles of good melodic

Whole tone (f:i)			
Major semitone (f:h)		Minor semitone (h:i)	
Comma (f:g)	Minor semitone (g:h)		
66429 (f)	65536 (g)	62208 (h)	59048 (i)
True values			
531441	524288	497664	472392
Compare true values ÷ 8			
66430.125	65536	62208	59049

Figure 1 Divisions of the tone given by Jacques (*SM II. xlviij*) compared with the correct values

Two of these come close together in the forty-ninth chapter of the second book, in connection with numerical reasoning. The chapter investigates which are the smallest numbers that may legitimately be taken to represent the proportion of the comma ('Qui sint minimi numeri proportionis commatis'), and the 'formula' occurs first to justify numerical approximation and then to reject it.

First Jacques examines the claim that the comma is the amount by which the whole tone exceeds two minor semitones, representing the two minor semitones through the proportions between the numbers 65536 (g), 62208 (h) and 59048 (i). Thus 'g:h' and 'h:i' both represent the proportion 256:243. In fact this claim is not quite true, as while 'g:h' is exact ($256:243 \times 256:256$), 'h:i' is one out (it should be $256:243 \times 243:243 = 62208:59049$; he gives 62208:59048). Jacques's numeral 'i' is one unit too small.⁵⁰ He justifies the approximation with an exact statement of the 'formula': 'But things, which are near, are more or less the same and those terms [i.e., g and i] are the smallest numbers of the proportion of the minor tone, as will appear below.'⁵¹ In other words, 'i', a unit off from the true number of the proportion, is near enough to the true value to be taken as identical with it. Figure 1 shows the proportions Jacques uses in comparison

writing within the individual voices of the polyphony ensured the continuity between one consonance and another (see n. 13 above).

⁵⁰ In fact, at this point in his reasoning, Jacques suggests that in the proportion 'g:i' of two minor semitones, it is 'g' that lacks a unit. The reason for this is that he sets the numbers within the frame of a whole tone represented by the proportion 66429:59048 ($9:8 \times 7381:7381$). As 'i' is already given, it is 'g' that he is inclined to see as deficient to complete the proportion. Later on he acknowledges that 'i' is the number lacking in respect of the proportion of two minor semitones (*SM II. xlviij*; vol. iia, p. 121). The apotome, or major semitone, is also inaccurately realised in this numerical series: 'fh' (66429:62208) as compared with 531441:497664 \simeq 66430:62208, its accurate calculation. Jacques claims that 'fh' represents the apotome as it includes a minor semitone and the comma, without acknowledging that this will be only an approximation, as the value of the comma itself is not exact.

⁵¹ 'Ea autem, quae sunt prope, sunt quasi idem et illi termini sunt minimi numeri proportionis toni minoris, ut patebit infra.' *SM II. xlviij*; vol. iia, p. 119.

with their true values. Only the minor semitone 'g:h' and the whole tone 'f:i' are accurate; all the other intervals are approximated.

In fact, Jacques seems to be advancing here an argument propounded by others as a foil for his own view, as he goes on to reject it. Towards the end of the chapter the 'formula' returns but now modified to register the difference between true identity and the approximation previously accepted. His rejection of approximation has the fortunate effect of leading him to qualify 'close' (*prope*): 'And these things, which are close, are not the same, but more or less the same. It does not follow: "This is close to the house, therefore it is in the house or at the house." For this word "close" is seen to convey a certain exceptional or exclusive force.'⁵² The use of a spatial metaphor to clarify the meaning of *prope* suggests that Jacques viewed numbers not as discrete quantities but as members of an ordinal series. What makes 59049 and 59048 close is not the similarity of their quantities, but their proximity in the series of natural numbers. A quantitative element cannot be denied to the idea, as 1 and 2 are close by the same reckoning, but he would surely not have regarded them as being 'more or less the same' in this context. Although he distances himself from such approximation, the fact that he discusses it at all indicates that it was a tool of reasoning sometimes used at the time; and approximation is at the heart of the next two chapters, which consider representations of the comma by the superparticular ratios on either side of it (75:74 too small and 74:73 too large).

This use of the 'formula' gives us a way of understanding *cadentia* as the assimilation of imperfect concords to perfect concords close to them in the order of concords. This explanation is not entirely satisfactory, however; for while it may account for the relationship of middle concords to perfect ones, which are adjacent in the order, it is unconvincing for imperfect concords, which also progress to perfect concords, but which are not so close in the order: they ought to progress to middle concords.

The other two instances of the 'formula' (of which the second is a reformulation of the first) use it in a rather different way. The first of them is found in the first book of the treatise, where the twenty-sixth chapter discusses the differences of sounds ('sonorum differentiae'):

⁵² 'Nec ea, quae sunt prope, sunt idem, sed quasi. Non sequitur: "Iste est prope villam, ergo est in villa, vel ad villam." Haec enim dictio "prope" quamdam vim exceptivam vel exclusivam importare videtur.' *SM* II. xlviiii; vol. iia, p. 121. The use of *prope* for approximation in this passage may be compared with the following from Aquinas: 'But islands that are close to land are more-or-less parts of the land' ('Set insule que sunt prope terram sunt quasi partes terre'). Kevin White, 'Three Previously Unpublished Chapters from St. Thomas Aquinas's Commentary on Aristotle's *Meteora*: *Sententia super meteora* 2.13–15', *Mediaeval Studies*, 54 (1992), pp. 49–93, at 93). Perhaps the idiom was common in speech.

And it should not be thought that a single sound is generated from a single impulse of a stretched string in the air, but several, as many that is as when a vibrating string in oscillating strikes the air sufficiently to cause sound. But because things that are close are seen more or less not to differ at all, these neighbouring sounds are adjacent and similar. Not discriminating between them, sense judges the sound there to be joined together as one, just as the colour red or green placed on some part of the surface of a hoop, when the hoop is spun rapidly, is seen to affect circularly the whole surface of this hoop, and the same appears in any of the colours of the rainbow.⁵³

Jacques here conceives the sound of a vibrating string as comprising many individual vibrations. These many short constituent sounds (the vibrations), because they are temporally very close together and very similar to one another in pitch and tone colour, are assimilated to one another by the senses so that a single sound is perceived. ‘Close’ means here temporal adjacency at a certain threshold of perception.

The comparison with the spinning hoop,⁵⁴ with which Jacques attempts to clarify the conception of closeness, offers another way of understanding *cadentia*. Although colour is located on just one part of the hoop, as this coloured section spins with the hoop at velocities in excess of a certain minimum, the eye ceases to distinguish the movement of the coloured portion with the spinning of the hoop or the flashing of the colour as it returns repeatedly to the same point in the revolution; it sees instead a continuous line of colour, as if the whole hoop were coloured. Instead of perceiving so many revolutions, one sees a complete circle of colour. In a similar way, in discant, comprising a mixture of perfect and imperfect

⁵³ ‘Nec putandum est ex uno tactu chordae in aere expansae sonum unum generari, sed plures, tot scilicet quot vicibus chorda tremula percutit aerem sufficienter ad causandum sonum. Sed, quia ea quae prope sunt, quasi nihil differre videntur, illi autem soni vicini propinqui sunt et similes. Non discernens inter illos, sensus iudicat ibi sonum esse unum continuatum, velut color rubeus vel viridis in aliqua parte sumitatis trochi positus, cum trochus velociter rotatur, videtur circulariter totam illius trochi sumitatem afficere, et idem patet in aliquibus iridis coloribus.’ *SM* I. xxvi; vol. i, p. 80. This passage is echoed in the second chapter of the second book, where the mechanics of sound are recapitulated as a prelude to the discussion of consonances: ‘For the string of a psalter struck once makes several sounds before it ceases, just as trembling itself it strikes the air many times. These [sounds] do not, however, make consonance, because their distinct note is uncertain, unstable and confused and not well sensed. For sense judges the sound there to be one and continuous, on account of the equality and proximity [of the sounds]. For one [sound], as if suddenly and imperceptibly, snatches the other in regard to weight [i.e. prominence or intensity?] or speed, because things that are near seem more or less not to differ at all.’ (‘Percussa enim semel psalterii chorda plures, antequam quiescat, facit sonos, sicut pluries ipsa tremula aerem verberat. Illi tamen consonantiam non faciunt quia incerta est, instabilis et confusa et non bene sensui nota illorum distinctio. Iudicat enim ibi sonum esse sensus unum et continuum propter aequalitatem et vicinitatem. Unus enim, quasi subito et imperceptibiliter, in gravitate vel in velocitate rapit alium, quia, quae prope [recte: prope] sunt, quasi nihil differre videntur.’) *SM* II. ii; vol. iia, p. 10.

⁵⁴ Here, as so often in *Speculum musicae*, Jacques is indebted to Boethius, whose account of a spinning top (*turbo*) he borrows and adapts. *De institutione musica*, ed. G. Friedlein (Leipzig, 1867), I. iii (p. 190).

concorde, when it is performed at speed, the whole is rendered perfect because the perfect concords add, so to speak, a sheen of perfection to the whole, as does the splash of colour to the rotating hoop.

There is an air of plausibility to this as an understanding of how discant might sound perfect despite the imperfections in its harmony. However, this way of understanding *cadentia* is also not entirely satisfactory, for there is no reason in it why the imperfect concords could not be discords, just as it does not matter what colour the hoop is before the paint is added to it.

So Jacques uses the 'formula' in the first two books to argue for approximation on the grounds of two types of closeness: ordinal proximity in the case of approximated numbers and temporal proximity in the case of the vibrations of a string. Although neither of these applies in an entirely satisfactory way to *cadentia*, both seem to shed some light on it. In the first sense, imperfect concords are ordinally closer to perfect concords than are discords. So the use of imperfect concords can be understood on the grounds that they are close enough to perfect ones to be more or less the same as them. In the second sense, the perfection of discant with imperfect concords can be understood on the basis of the temporal proximity of the perfect concords to each other when the music is performed at an appropriate tempo, assuming (as is likely) that Jacques had in mind here the *Ars antiqua* style, grounded in an alternation of contrasting sonorities.⁵⁵ Jacques offers no help in deciding between these two senses, and the meaning at this crucial point in the chapter is frustratingly unclear. Of course, the two do not conflict with one another, and both may be taken as conditions for the effect of *cadentia*. A key point emerges, though, that through the agency of *cadentia*, however exactly this may work, imperfect concord is perfected.

CADENTIA AND THE REDEMPTION OF IMPERFECTION

That the perfection of imperfect concord is the purpose of the concept is borne out by a further occurrence of the term in the seventh book, the term's only recurrence in *Speculum musicae*. In the eighth chapter Jacques considers the relationship between the consonances of the fourth and the fifth. Arguing that the fourth concords better above the fifth than below it, he proposes that it does so because the high note of the fourth is joined to

⁵⁵ *Ars nova* music, by contrast, permitted strings of imperfect consonances in succession before arriving at perfect consonances. The characterisation of *Ars antiqua* polyphony as being based on the succession of contrasting sonorities has been illuminatingly discussed in C. Dahlhaus, *Untersuchungen über die Entstehung der harmonischen Tonalität* (Saabrücker Studien zur Musikwissenschaft, 1968), trans. R. O. Gjerdingen, *Studies on the Origin of Harmonic Tonality* (Princeton, 1990), pp. 71–83.

the high note of the octave arising from the combination of the consonances and because the low note of the fourth is joined to the high note of the fifth. His reasoning stems from a belief that concord derives more from the higher than from the lower of two notes comprising a consonance.⁵⁶ He argues further that the combination of fourth on top of a fifth on top of an octave also concords well and caps these arguments with the statement: ‘Since an imperfect concord before a perfect one is perfected on account of the *cadentia* into it [i.e. the perfect concord], it seems rational that some concord, for instance a fourth, is enriched from a more perfect one if it comes into contact with that.’⁵⁷ By this he means that the fourth is enhanced from its contact with the octave that results from combining the fourth with the fifth in the same way that imperfect concords are perfected in sequence with perfect ones. The reasoning of the statement does not help his case, since both the fourth and the fifth belong to the same kind of perfect concord in his scheme; accordingly either ought to be enriched by contact with the octave, and thus this constitutes no ground for preferring the placement of fourth above fifth over that of fifth above fourth. The remark is valuable, however, in showing that Jacques regarded *cadentia* as the agency of perfection, the property of an interval by which it might be bestowed with greater perfection through contact with more perfect intervals.⁵⁸

⁵⁶ ‘Concord is given more by the high notes than by the low; and experience teaches, and sense too, that it is so. It contributes to the confirmation of this that the high voice seems more perfect than the low, because the low is closer to silence than the high, just as low and slow movement is calmer than fast. And similarly when a man proceeds in ascending from low notes to high, the spirit seems to emit more in a high [note] than in a low one, to make more and stronger movements.’ (‘Concordia autem amplius datur acutis vocibus quam gravibus et, quod ita sit, experientia docet et sensus. Ad cuius confirmationem facit quod vox acuta perfectior videtur quam gravis, quia gravis magis appropinquat silentio quam acuta, sicut motus gravis et lentus quieti quam velox. Et cum idem homo procedit ascendendo a gravibus vocibus ad acutas, in acutis plures emittere videtur spiritus quam in gravibus, plures et fortiores facere motus’.) *SM* VII. viii; vol. vii, pp. 20–1.

⁵⁷ ‘Quodsi concordia imperfecta ante perfectam perficiatur propter cadentiam in ipsam, rationale videtur ut concordia aliqua, puta diatessaron, augeatur ex perfectiore si communicet cum illa.’ *SM* VII. viii; vol. vii, pp. 21–2. Presumably *ipsam* refers to *perfectam* [*concordiam*] here.

⁵⁸ Mention should be made here of the statement heading the third chapter of the *Compendium de musica*: ‘The reason for the goodness of consonance is perfected *cadentia* in the genre of inequality.’ (‘Ratio bonitatis consonantiae est perfecta cadentia in genere inaequalitatis.’) Jacques de Liège, *Tractatus de consonantiis musicalibus, Tractatus de intonatione tonorum, Compendium de musica*, ed. J. Smits van Waesberghe, E. Vetter and E. Visser (*Divitiae musicae artis, A/IX*; Buren, 1988), pp. 88–122, at 93. The work has been attributed to Jacques de Liège (*ibid.*, pp. 8–9), and if this identification is correct, then the statement is of evident relevance to an assessment of his concept of *cadentia*. The doctrine of the *Compendium* differs from that of the *Speculum musicae* in various respects (the distinction between consonance and concord is not maintained in the same way, and the unison is not included among the consonances, to cite just two important differences), so the understanding of *cadentia* may differ also.

The term *cadentia* is not commented on or explained in what is a highly compressed text, but several occurrences of the verb *cado* in the second and third chapters may relate to it. The verb

Underlying Jacques's view of *cadentia*, then, is what might be termed a 'redemptive effect'. Imperfect consonances are made perfect and therefore good through it. Comments on the unison and octave bear this out:

This consonance [the unison], because of the ultimate unity that the notes bring to it, makes other bad ones around it better, for as much as they fall into it. . . .

Also on account of its goodness, [the octave] makes better imperfect consonances beside it, such as a sixth or seventh, so that they strive to fall into it directly, coinciding in this with the unison.⁵⁹

The unison and octave make less perfect intervals beside them better. They redeem them for perfection.

The capacity of *cadentia* to perfect imperfect concords was an important function for Jacques's theory, as perfection was an essential value for him. An aversion to the lesser degree of perfection in modern music was one of the most important components underlying the polemical stance of the

appears three times through the two chapters to indicate consonances 'falling' into particular 'genera of inequality' (i.e., types of proportion, multiple or superparticular, for the interval kinds identified as consonances in the second chapter: fourth, fifth, octave, twelfth and double octave). Perfected *cadentia* may then simply refer to the fact that all intervals deemed to be consonances fall within these fundamental types of interval proportion. If this is so, the expression seems odd, but it is nonetheless clear that *cadentia* is regarded as an agency of perfection, in a way different from that of the *Speculum musicae* but congruous with it. However, the 'falling into genera' of these subsequent statements may simply be a standard idiom for the alignment of things with general types and have no direct relationship to *cadentia* in the specific sense implied by the opening sentence.

The second chapter introduces grades of consonance, similar to the grades of perfect concord introduced in the fourth book of *Speculum musicae*: 'Of the consonances, the fourth is good, the fifth better and the octave best. This is therefore because the parts of the definition of the consonance meet in the same [parts] following more and less [i.e., proceeding from greater to smaller: 4:3, 3:2, 2:1].' ('Consonantiarum autem bona est diatessaron, diapente melior, diapason vero optima. Hoc ideo quia partes diffinitionis consonantiae eisdem secundum magis et minus competunt'; p. 92.) There is a clear numerical falling in this series, and if the *cadentia* referred to at the beginning of the second chapter relates to this, then it is like the descent through the order of concords that is indicated in *Speculum musicae*.

Following the introduction of grades of consonance, the verb *cado* occurs again, this time in reference to the different auditory effects of the consonances: 'For the fifth falls more sweetly in the ear than the fourth, and the octave than the fifth.' ('Dulcius enim diapente in aure cadit quam diatessaron, et diapason quam diapente'; p. 92.) This suggests an empirical correlate for the rational 'falling' through proportions and seems like an adumbration of the more developed theory of contrasting degrees of concordant blend in the *cadentia* of *Speculum musicae*. In this tentative form, there is a hierarchy of perfection proceeding from superparticular proportions (fourth and fifth) to the simpler multiple proportion of the octave, and this is matched by the greater sweetness of the octave in comparison with the fourth and fifth.

The precise significance of the *Compendium's* statement on *cadentia* is unclear, but the relationship in which it sets the concept to the idea of perfection is unmistakable and tallies with the theory of the *Speculum musicae*.

⁵⁹ 'Haec consonantia, propter summam unionem quam eius important voces, alias de se malas, pro quanto cadunt in eam, reddit meliores . . . Etiam propter eius bonitatem consonantias de se imperfectas, ut unam sextam vel septimam, ut immediate nituntur cadere in eam, meliores reddit, in hoc cum unisono conveniens.' *SM* II. xi and xv; vol. iia, pp. 36 and 45).

seventh book. A diatribe against the use of imperfect time in the music of the *Ars nova* is given in chapter 45 and spills over into the three that follow it. It was not imperfect time values themselves that Jacques objected to in modern music, as these were a standard part of the *Ars antiqua*. Rather it was their autonomy in *Ars nova* theory that concerned him.⁶⁰ In the theory of the *Ars antiqua*, imperfect longs frequently occurred, but they were always accompanied by breves (or by semibreves to the value of breves), creating a perfection. Thus imperfect things were subordinated to perfection. In *Ars nova* music, composers were often content to render temporal values imperfect throughout a composition, with no completion in perfection at the end. In the temporal domain, the music of the *Ars antiqua* was superior in his view because imperfect values were always resolved in perfection.⁶¹ This music posed a problem for him in the harmonic domain, however, as it was quite liberally composed with imperfect concords. Yet Jacques maintained that good (that is, perfect) concord was essential to good discant.⁶² He had to find a way in which imperfect concords did not vitiate the perfect concord, and the concept of *cadentia* was it. Like the concept of perfection in the rhythmic domain, *cadentia* enabled imperfect elements to become effectively perfect through their contact with perfect things.

The need for perfection in music is reinforced by Jacques in the seventh book in a passage that also offers a synthesis of perfection in the temporal

⁶⁰ The sloppy reasoning of *Ars nova* theorists also roused his ire. D. Tanay, *Noting Music, Marking Culture: The Intellectual Context of Rhythmic Notation 1250–1400* (Neuhausen-Stuttgart, 1999), pp. 146–81.

⁶¹ Jacques was blind, like his *Ars antiqua* predecessors, to the duple groupings inherent in the third, fourth and fifth of John of Garland's six rhythmic modes (though following Franco he referred to just five modes). *SM* VII. xviii; vol. vii, p. 40.

⁶² 'Discant is called "the consonance of distinct songs" because, just as consonance requires distinct notes combined at the same time, so discant [requires] distinct songs combined at the same time; and, just as whatever sounds combined simultaneously do not create a mixture that presents itself smoothly and sweetly to the auditor, so does not every distinct song combined at the same time make discant, but those which concord mutually so that it seems as if there is one song from their good concord although they are several, just as from their distinct notes the octave or fifth make it seem as if there is one sound on account of good concord . . . Therefore he who discords with the other does not sing discant . . . What therefore is discant unless it is as if one song comes from two or more distinct songs on account of good concord! To discant is to make it seem as if one song arises from two or more distinct songs through sweet concord.' ('Dicitur discantus "consonantia distinctorum cantuum" quia, sicut consonantia requirit distinctas voces simul mixtas, sic discantus distinctos cantus simul mixtos et, sicut non quicumque soni simul mixti faciunt mixtionem suaviter dulciterque auditui se facientem, sic nec omnes distincti cantus simul mixti discantum faciunt, sed illi qui invicem concordant ut per bonam illorum concordiam ex illis fiat quasi cantus unus cum sint plures, sicut ex distinctis vocibus ipsius diapason vel diapente propter bonam concordiam efficitur quasi sonus unus . . . Qui ergo cum alio discordat, non discantat . . . Quid est igitur discantus nisi duorum cantuum vel plurium distinctorum propter bonam concordiam quasi cantus unus! Discantare est de duobus vel pluribus distinctis cantibus propter suavem concordiam quasi cantum unum facere.') *SM* VII. iv; vol. vii, pp. 10–11.

and harmonic elements. The thirtieth chapter adds a theological dimension to the argument by directly relating perfection to the Holy Trinity.⁶³ The tone of the chapter is defensive, the bulk of it countering three objections raised against the view.⁶⁴ It seems likely that the stakes of this argument would have been high, in the light of *Ars nova* developments in the treatment of imperfection. Jacques restates his position boldly:

All perfection proceeds from the highest and first perfection and as a consequence every ternary number, threeness or thirdness by reason of the perfection which it rightly conveys is drawn into the first, highest and most perfect Trinity. . . . And since song [assembled] from perfect [time values] is drawn into the highest first and most perfect Trinity by reason of threes, it is not so for song [assembled] from imperfections since no imperfection falls back or could fall truly into that highest Trinity.⁶⁵

This much is clear for the rhythmic dimension of music, but what of its harmonic dimension? Should harmony be based on the interval of the twelfth (expressed by the ratio 3:1)? Plainly this would be unrealistic; and Jacques has a solution for the problem of reconciling harmonic reality with theory, which arises as he answers the second of the objections introduced near the beginning of the chapter:

'In the same way that God is three in persons, just as he is one in substance, natural song should no more be drawn into the divine Trinity than into its unity.' It should be said that cantus naturally composed from perfections is carried both into the divine Trinity and into its unity: into the Trinity by reason of the perfections and distinctions that the ternary number conveys, into unity itself indeed by reason of the concord which in singing of this type is required, for concord is named from the concord of distinct notes or distinct melodies reduced to one.⁶⁶

⁶³ *SM VII. xxx*; vol. vii, pp. 60–2. In this, Jacques follows the Thomist tradition of *analogia entis*, found in the treatises of Lambertus and Franco of Cologne. Tanay, *Noting Music, Marking Culture*, pp. 42–4.

⁶⁴ [1] For it is said that, before God took up human flesh, the essential salvation of God, song could be from imperfect [time values]. [2] Again, in the same way that God is three in persons, as he is one in substance, natural song should no more be drawn into the divine Trinity than into unity. [3] Again, whether [song] is sung from perfect or from imperfect [time values], God is neither more nor less three and one.' ('Dicit enim quod, antequam Deus carnem assumeret humanam, salva Dei essentia, ex imperfectis cantus esse poterat. Item cum similiter sic Deus trinus est in personis, sicut unus in substantia, non plus debet cantus naturalis referri in Trinitatem divinam quam in unitatem. Item sive cantetur ex perfectis sive ex imperfectis, neque plus neque minus Deus est trinus et unus.') *SM VII. xxx*; vol. vii, p. 60.

⁶⁵ 'Omnis perfectio a summa et prima procedit perfectione et per consequens omnis ternarius, trinitas vel ternareitas ratione perfectionis quam importat iure in primam summam et perfectissimam reducitur Trinitatem. . . . Et cum cantus ex perfectis ratione ternarii in summam primam et perfectissimam reducatur Trinitatem, non sic cantus ex imperfectis cum in summa illa Trinitate nulla prorsus cadat vel cadere possit imperfectio.' *SM VII. xxx*; vol. vii, pp. 60–1.

⁶⁶ '<Cum similiter sic> Deus trinus est in personis, sicut unus est in substantia, non plus debet cantus naturalis ex perfectis confectus referri in divinam Trinitatem quam in ipsius unitatem.' Dicendum quod cantus naturalis ex perfectis compositus refertur et in divinam Trinitatem et in ipsius unitatem: in Trinitatem ratione perfectionis et distinctionis quam importat ternarius, in ipsam vero unitatem ratione concordiae quae in huius modi cantibus requiritur, nam

If the dual numerical identity of God as one and three seems to undermine the force of Jacques's claims for the triple number and the Trinity as a basis for musical order, he answers this by applying these numbers to two different dimensions of mensural music. The perfections of rhythm are 'drawn into' the Trinity; while the unity of concord, the meld of two notes into a single sound, represents God's unity. The agency for this latter, though it is not acknowledged here, is *cadentia*, by which every more imperfect concord is supported in its falling by a more perfect concord, of which the unison is the most perfect example, the end point of unity into which all imperfections fall.⁶⁷

The stakes underlying the redemption of rhythmic and harmonic imperfection seem to be the object of the chapter's closing paragraphs, though the argument develops tangentially. Jacques addresses the third of the objections, that whether songs are sung in perfect or imperfect time, God remains unchanged as three and one. He accedes to this because God is intrinsically perfect. He goes on to extend the range of the statement by underlining God's immutability in relation to His creation. Yet we should not infer from this that there is no difference between sinful and virtuous behaviour, for God rewards good deeds and punishes bad ones. Quotations from Plato, St John and Augustine establish that sin does not come from God. A further quotation from Boethius states that sin is nothing because God cannot sin. Jacques qualifies this: although sin is not a thing in itself, it is nonetheless the lack of the good moral quality that deeds should have.

The chapter ends at this point without establishing how these reflections on sin relate to the argument about singing in imperfections. Readers are left to make the connection themselves. The intention seems to be to equate singing in imperfect time with sin, implying that although God is unchanged by it, he will punish it. We may infer that Jacques thought a polyphony too much compounded of imperfect concord would incur similar censure.

Part of Jacques's polemic in the seventh book derives from his commitment to a theory of divine reference according to which the order or disposition of elements in music refers back to God. *Cadentia* is the means by which 'sinful', imperfect concords may be redeemed to the perfection which is caused by God. It would have been easier for this theory if every polyphonic composition had actually ended with a unison. In the sixth paragraph of his chapter on *cadentia*, Jacques acknowledges

concordia dicitur distinctarum vocum vel distinctorum cantuum in unum <redacta> concordia.' *SM* VII. xxx; vol. vii, p. 61.

⁶⁷ The ideology of unity underpinning Western polyphonic theory at its earliest stage is examined by D. Cohen, 'Metaphysics, Ideology, Discipline: Consonance, Dissonance, and the Foundations of Western Polyphony', *Theoria*, 7 (1993), pp. 1–85.

both the octave and unison as the chief final concords of discant, before admitting the fifth and even the fourth as occurring also. Practice could be refractory from a theoretical perspective. If the fifth and fourth are overlooked, even the octave represented a slight problem for him. If it were allowed to stand as perfect in and by itself (as he states in the fourth paragraph), then this admits perfection to the ratio 2:1, since the ratio of an interval is one of the causes of its perfection;⁶⁸ and if this is admitted, then his objection against imperfect time is weakened. If he required that the octave actually be perfected by the unison (which he allows as a possibility in the fourth paragraph), his theory is in direct opposition with an overwhelming quantity of the actual practice that he endorses.

There is another problem with the theory of *cadentia* for Jacques's polemical ends. Although *Ars nova* music often made a greater use of dissonance than that of the *Ars antiqua*, it nonetheless respected the supremacy of perfection in the harmonic realm: there was always a perfect chord at the end. *Cadentia* could have been used as a justification of *Ars nova* harmonic practice just as it was by Jacques for that of the *Ars antiqua*. Yet Jacques was no less critical of the harmonic practices of the *Ars nova* than of its rhythmic ones.⁶⁹ It is understandable, then, that the concept of *cadentia* was tucked away at the end of the fourth book and scarcely acknowledged in the seventh. The completeness of his work required a chapter on concords set against each other in successive progression (*cadentia*) and simultaneous combination (*partitio*). *Cadentia* exceeded this remit, for it addressed other issues, both speculative and aesthetic. Yet its solution to the problems was not complete, and it could not represent a key element in the polemics of the seventh book, even though it was a necessary background to them.

THE RETROSPECTIVE AESTHETIC OF *CADENTIA*

The redemptive purpose of *cadentia* addressed a problem of an intellectual sort posed within the conceptualisation of concords as perfect and imperfect. As has been shown, concord was regarded as a primarily

⁶⁸ *SM* IV. xli; vol. iv, pp. 106–7.

⁶⁹ 'But now other discantors or composers of discant observe no requirement of these conditions, they do not make discant with good concord, they make wild cantus, wrongly pleasing, difficult, complicated and more or less unmeasurable, so that they badly heed [two of] the four causes that are needed in discants: the material [cause], that the voices concord when performed together; the formal [cause], that there is a harmonious arrangement, disposition, combination of them.' ('Nunc autem aliqui discantores vel discantium compositores nullam harum conditionum observant proprietatem, discantus faciunt non bonae concordiae, cantus faciunt silvestres, male placentes, difficiles, intricatos et quasi immensurabiles, sique male custodiunt quattuor causas quae in discantibus requiruntur: materialem, ut sunt voces concordantes simul prolatae; formalem, ut est conveniens ordinatio, dispositio, compositio illarum.') *SM* VII. v; vol. vii, p. 13.

aesthetic conception, and the notion of *cadentia* carried with it an aesthetic dimension, addressing the problem of how music can sound good in which certain of the elements are intrinsically dissatisfying. Surely the easiest course for a composer to choose would be to compose only with perfect concords, as imperfect concords would represent an offence against aesthetic sensibility. A true conservative might have advocated polyphonic composition only in the style of the ‘fifthing’ and ‘fourthing’ mentioned in the tenth chapter of the seventh book, where each instance of the texture would sound well.⁷⁰ Yet composers did compose with imperfect concords, including those admired by Jacques. The theory of *cadentia* sought also to explain how this could be.

In Jacques’s view of polyphony, there is not a drive from imperfect concords to perfect ones; rather the force is in the opposite direction: the perfect concords prop up the imperfect ones. This idea is implicit a few chapters earlier in discussion of the middle concords, where the case of the major and minor thirds is alluded to: ‘For a third pleases much, if it is sung sweetly in its place, namely before unison or fifth.’⁷¹ Despite not being wholly concordant on its own, a third can sound pleasing if it is put in the right place. The order of concords is of aesthetic consequence not to an understanding or appreciation of musical movement but to an acceptance of the concords themselves. In the right context, concords that might not be acceptable on their own become pleasurable.

Because of the *cadentia* of more imperfect concords to more perfect ones, the more perfect ones propped up the more imperfect ones and made them effectively perfect. In other words, music in which imperfect concords were used would sound well provided these intervals, less satisfying in themselves, were adjacent to perfect concords that made them sound good retrospectively (or perhaps it should be ‘retro-auditively’).

Jacques was not the first writer to have confronted this problem. The expanding range of intervals increasingly used in polyphonic composition during its development posed a significant problem to theorists given the strong current of Pythagorean ideology in their intellectual tradition.⁷² The simple *organum* of the *Musica Enchiriadis* treatises, doubling melody in parallel perfect consonances (or ‘symphonies’), conformed to Pythagorean ideals completely: each instant of the polyphony was perfect and sounded well on its own. The use of non-consonant intervals was hard to defend in theory. How could music

⁷⁰ The style is discussed in S. Fuller, ‘Discant and the Theory of Fifthing’, *Acta musicologica*, 50 (1978), pp. 241–75.

⁷¹ ‘Placet enim multis una tertia, si dulciter in loco suo, scilicet ante unisonum vel diapente, decantetur.’ *SM* IV. xxxvi; vol. iv, p. 99.

⁷² See Cohen, ‘Metaphysics, Ideology, Discipline’.

that used these other intervals be good? Practical music does not appear to have been much troubled by such questions, and composers quickly took to exploring the other intervallic combinations of two voices and the melodic independence of voices that their use enabled. Theorists then had to find a way of shoring up the gap between practice and theory, and the tradition that developed was one of explaining the phenomenon by the adjacency of concordant and discordant (or imperfect) intervals in polyphonic music.

The first hint of it can be found in the *De musica mensurabili* of John of Garland. He does not appear to have been concerned by the imperfection of major and minor thirds; but he did feel the need to justify the use in polyphonic practice of consonances that he regarded as discords:

It should be known that every discord [i.e., seconds, tritone, sixths and sevenths] may equal a middle concord [i.e., a fifth or fourth] before a perfect [i.e., unison or octave] or middle concord, and this is rightly employed before unison or octave: [He gives music examples of a tone before a unison and before an octave] and so it is for one [example]. And it is inappropriately employed before a middle [concord]. But this is frequently found in many parts of organum, such as a tone before a fifth, as in this example: [He gives music examples of a semitone before a fifth and of a tone before a fifth and before a fourth] And it should be known that a discord is never put before an imperfect concord, unless there is a cause in the colour or beauty of the music.⁷³

Although the case is not explicitly stated, the implication of this passage is that discords become acceptable (because they become equal to middle concords) when put before perfect, or less acceptably middle, concords. A similar idea is behind a passing remark of Franco of Cologne: 'any imperfect discord [by which he means a tone, major sixth or minor seventh] concords well immediately before a concord';⁷⁴ and in the same vein, Anonymus IV, referring to an instance in discant, owns:

And thus it appears, that a worthless or offensive discord, which the sixth is, and rejectable by all for the most part, is itself the penultimate before a perfect concord, which the octave is, and becomes the best concord under such ordering and positioning of notes or sounds, as was said before.⁷⁵

⁷³ 'Sciendum est, quod omnis discordantia ante perfectam concordantiam sive mediam aequipollet concordantiae mediae, et hoc proprie sumitur ante unisonum vel diapason: Ante unisonum tonu<s>. Tonus ante diapason. et sic de singulis. Et improprie sumitur ante mediam. Sed multum invenitur in multis partibus organi, ut tonus ante diapente, ut in hoc exemplo: Semiton<ium> ante diapente. Tonus ante diapente. Tonus ante diatessaron. Et sciendum, quod numquam ponitur discordantia ante imperfectam concordantiam, nisi sit causa coloris sive pulchritudinis musicae.' Johannes de Garlandia, *De mensurabili musica*, ed. Reimer, i, p. 74. The explanation of Garland's hierarchy of discords given by Carl Dahlhaus (*Studies on the Origin*, p. 80) is at odds with the example given by Garland of the semitone progressing to a fifth.

⁷⁴ 'omnis imperfecta discordantia immediate ante concordantiam bene concordat'. Franco of Cologne, *Ars cantus mensurabilis*, ed. G. Reaney and A. Gilles (CSM 18; [Rome], 1974), p. 68.

⁷⁵ 'Et sic patet, quod vilis discordantia sive taediosa, quae est sexta, et refutabilis ab omnibus in maiori parte, et ipsa est paenultima ante perfectam concordantiam, quae est diapason, optima

And he goes on to say that the same may apply to any discord, and that some musicians even treat several discords in sequence in the same way.

Incidental comments of this sort may have served as a starting point for more elaborate formulations developed by others. Walter Odington adumbrated a theory of how the phenomenon worked: 'Diaphony is a concurring discord of lower notes with higher ones, so called because it does not proceed by concords throughout, but because the following concord removes the displeasure of the preceding discord, and this is commonly called *organum*.'⁷⁶ Interestingly, Odington puts discord at the forefront of his conception of polyphony.⁷⁷ The function of the concords is to make the discords bearable.⁷⁸ Discord that is made concordant is the essence of this kind of polyphony for him, a view that is borne out by the bold writing of many late thirteenth-century motets.

The Pseudo-Franconian *Compendium discantus* found a neat way to sidestep the problem by formulating a basic differentiation between consonances that are perfect in themselves and those that gain perfection through their placement:

Three of the consonances are perfect by themselves, namely: unison, diapason and diapente. Three are [perfected] by circumstance, namely: semiditone, ditone proceeding in order to the diapente or unison, or tone with diapente proceeding in order to the diapason; one is perfect, and not perfected by circumstance, namely the fourth.⁷⁹

concordantia fit sub tali ordinatione et positione punctorum sive sonorum, ut praedictum est.
F. Reckow, *Der Musiktraktat des Anonymus 4*, 2 vols. (Wiesbaden, 1967), i, p. 80.

⁷⁶ 'Diaphonia est concors discordia inferiorum vocum cum superioribus, sic dicta quia non per totum proceditur per concordias, sed quia concordia sequens tollit offensionem discordiae prioris, et haec organum communiter appellatur.' Walter Odington, *Summa de speculatione musicae*, ed. F. Hammond (CSM 14; [Rome], 1970), p. 127.

⁷⁷ Richard Taruskin argues that the Guidonian idea 'discordia concors' was a central aesthetic tenet of motet composition in the thirteenth and fourteenth centuries, a view that lends Odington's theoretical perspective a special pertinence even though, as an Englishman, he would have been at the periphery of the main developments. R. Taruskin, *The Oxford History of Western Music*, 6 vols. (New York, 2006), i, pp. 148, 226, 229, 236, 255, 261, 286 and 424.

⁷⁸ 'Which are the concurring discords: There are six concurring discords: semiditone, ditone, diapente with tone, diapason with semiditone, diapason with ditone, diapason with diatessaron. About these enough has been said. Therefore they are called concurring discords for the reason that although they themselves discord, put before others [these] bestow a sweeter concord on them.' ('Quae sunt concordies discordiae. Concordies discordiae sunt sex: semiditonus, ditonus, diapente cum tono, diapason et semiditonus, diapason et ditonus, diapason et diatessaron. De his satis dictum est. Ideo dictae sunt concordies discordiae eo quod ipsae etsi discorderent aliis propositae suaviorem illis tribuunt concordiam.') Odington, *Summa de speculatione*, ed. Hammond, p. 75.

⁷⁹ 'Consonantiarum tres sunt per se et perfectae, scilicet: unisonus, diapason et diapente. Tres sunt per accidens, scilicet: semiditonus, ditonus in ordine ad diapente vel unisonum, vel tonus cum diapente in ordine ad diapason; una est perfecta, et non perfecta per accidens, scilicet diatesseron.' *Anonymus, De musica libellus* (Ms. Paris, Bibl. Nat., lat. 6286); *Anonymus, Tractatus de discantu* (Ms. Saint-Dié, Bibl. Municipale, 42); *Pseudo-Franco de Colonia, Compendium discantus* (Ms. Oxford, Bodl. Libr., Bodley 842); *Anonymus, Traité de deschant* (Ms. Paris, Bibl. Nat., lat. 15139); *Anonymus, Traité de deschant* (Ms. Paris, Bibl. Nat., lat. 14741), ed. G. Reaney (CSM 36; Neuhausen-Stuttgart, 1996), pp. 50–1.

There is no categorial difference here between perfect and imperfect consonances, so the author does not have to confront the problem that Jacques tried to solve; all consonances used in polyphony are reckoned to be perfect, but it is the way in which they are perfect that differs, and this is their defining characteristic.

Jacques's notion of *cadentia* is similar to Odington's idea of concord removing the displeasure of discord, but it regards consonances that Odington thought discordant to be imperfect concords. Suiting the speculative nature of the first part of his treatise, Jacques developed the idea, presenting a theory of the agency of this phenomenon. Imperfect concords, which sound unsatisfactory on their own, are relatively weak and in a state of falling towards the perfection of perfect concords, which sound well on their own. In the light of an ensuing perfect concord, the imperfect concord also sounds well. The aesthetic is not the prospective one of the directed progression, but a retrospective one; it is not the aesthetic of the *Ars nova* but that of the *Ars antiqua*.

ENVOY

Marchetto of Padua, writing in his *Lucidarium in arte musice plane* at roughly the same time as Jacques, can be seen to address a similar problem to that of Jacques's *cadentia* but in importantly different ways and with significantly different effects. He was more modern than Jacques in that the only intervals with which he concerned himself for the purposes of polyphony were the unison, fifth, octave, major and minor thirds and major sixth. In contrast to Jacques, but similar to Franco and Odington, he classified the thirds and major sixth as types of dissonance; so the challenge he faced was to explain how acceptable music could be written with dissonances, which, following Boethius (though crediting Isidore of Seville), he defined as 'a mixture of two pitches that strikes the ear as rough and unpleasant'.⁸⁰ Clearly, with such a definition in mind, it ought not to be possible to use them. For him, certain dissonances could be made acceptable through voice-leading propinquity to consonances, thus the thirds and major sixth were 'endurable by the ear and mind'⁸¹ on account of their proximity to unison, fifth or octave by voice-leading. The reason for this is that dissonant sounds, which he regards as being imperfect, require perfect, that is consonant, ones. 'The less distant the dissonance lies from the

⁸⁰ 'duorum sonorum sibimet permixtorum ad aurem veniens aspera atque inioconda permixtio'. *The Lucidarium of Marchetto of Padua. A Critical Edition, Translation, and Commentary*, ed. and trans. J. W. Herlinger (Chicago and London, 1985), pp. 200–1. All references to Marchetto's *Lucidarium* cite both text and translation of Herlinger's edition.

⁸¹ *Ibid.*

consonance the less distant is it from its perfection and the more it is assimilated to it, and thus the more agreeable it is to the ear, as if it partook more of the nature of the consonance.⁸²

What is also strongly contrasted with Jacques's notion of *cadentia* is the explicit connection that Marchetto establishes between the accommodation of dissonances and an idea of musical motion. Like Jacques, he cites Boethius' definition of dissonance, stating that each note of a dissonant interval 'strives to flee' (*gliscit ire*) the other, and as thirds and major sixth are for him dissonances, this introduces a dynamic element directly into the substance of polyphonic music. He goes on to say that each note 'seeks to go to the location where it will produce a pleasant, amicable, sweet mixture, that is, a consonance'.⁸³ The statement is then consolidated: 'When two notes lie in a dissonance compatible to the ear, each, seeking consonance, must be moved so that if one tends upward the other tends downward.'⁸⁴ Marchetto very clearly presents the idea here of resolution of dissonance through the movement of musical progression, specifying contrary motion and voice-leading propinquity. In this respect his thinking is fundamentally different from that of Jacques and relates more closely to the discourse of the directed progression that can be found in later writings, one that related also more closely to contemporaneous polyphonic practice.

There is a characteristically anti-modern strain in Jacques's aesthetics. For while Marchetto and other *Ars nova* theorists of *contrapunctus* own a prospective aesthetic, one by which the end may be known from the implications of the events preceding it, an aesthetic sense that has continued into modern tonal theory, Jacques reckons the effect of the music retrospectively. We do not know the following perfect concord from the preceding imperfect one; rather, we look back at the preceding imperfect concord from the vantage point of its perfect successor and discover that it too is, in a sense, perfect, by association. There is a similarity between Jacques's thinking here and Guido d'Arezzo's in his description of the effect of modal colour, in a passage that Jacques himself cites.⁸⁵ Guido does not attribute it to a prospective drive towards a tonal goal (the tonic of

⁸² 'Quanto enim dissonantia minus distat a consonantia, tanto minus distat a sua perfectione et magis assimilatur eidem, et ideo magis amicabile est auditui, tamquam plus habens de natura consonantie.' *Ibid.*, pp. 208–9. His theory is not strong, as on its account diminished thirds and augmented sixths should be more 'endurable by the ear and mind' than minor thirds or major sixths, being closer than these to the unison and octave respectively.

⁸³ 'quod uterque sonus ad locum ire cupit ubi est permixtio iocunda, amicabile, et suavis, hoc est consonantia'. *Ibid.*, pp. 200–1.

⁸⁴ 'Oportet enim quod quando due voces sunt in dissonantia que compatitur ab auditu quod ipsarum quelibet requirens consonantiam moveatur ita videlicet, ut si una in sursum tendit, reliqua in deorsum.' *Ibid.*, pp. 202–3.

⁸⁵ See the fortieth chapter of the sixth book, 'That the modes are known principally from their final notes' ('Quod a vocibus finalibus principaliter modi cognoscuntur'). *SM VI*. xl; vol. vi,

common-practice tonality), but to a retrospective comprehension of the colouration in the light of its end-point (the modal final):

And although any chant may come about through all the notes and intervals, the note that ends the chant, however, is the chief one; for it sounds longer and more lingeringly. And the foregoing notes, as appears only to those who have been trained, are thus adapted to it so that in an amazing way they seem to draw a certain appearance of colour from it.⁸⁶

As the *Ars nova* style simplified harmonic progression, centring more and more on thirds and sixths as the constituent elements of imperfect chords and resolving them predictably to fifths and octaves, theory had to take only a small step to arrive at the view that an imperfect consonance heralded the coming perfect one, and thus to create an aesthetic model based on anticipation.⁸⁷ This is the idea clearly articulated in some later treatises, and it is this that gives rise to the notion of the directed progression. Such is only possible where the goal of a progression is specifically predictable from the first element, and this is the case with the typical progressions of minor third to unison, major third to fifth and major sixth to octave that the other theorists intend. Jacques had these progressions in view; but as advocate of the older style, he had many other progressions in view too. His notion of *cadentia* was not useful to the musicians of his time; and when a notion of harmonic *cadentia* finally made its way into the mainstream of music theory, it was in a form unrelated to his conception.

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p. 98. See also n. 41 above for another instance where Jacques's aesthetics of polyphony compares with that of monophony.

⁸⁶ 'Cum autem quilibet cantus omnibus vocibus et modis fiat, vox tamen quae cantum terminat, obtinet principatum; ea enim et diutius et morosius sonat. Et praemissae voces, quod tantum exercitatis patet, ita ad eam aptantur, ut mirum in modum quamdam ab ea coloris faciem ducere videantur.' Guido of Arezzo, *Micrologus*, ed. J. Smits van Waesberghe (CSM 4; [Rome], 1955), 139–40.

⁸⁷ The idea is particularly clear in a passage from Johannes Boen's *Musica*: 'Moderns have increased the similarity between the third and the sixth on account of reciprocal influence, which they have mutually, so that just as three thirds may follow one another, so also may three sixths; and they maintain this for this reason, that a song, which is rated imperfect on account of thirds and sixths, not however being inharmonious draws and attracts the ears, so that the perfection of the song, which is to follow through a fifth or octave, of which the thirds and sixths are heralds and maidservants, they [the moderns] declare sweeter being longer awaited, as here [he gives a music example]; but they do not maintain this for fifths and octaves, in case the ear ceases from its attention, thinking that motion ceases with the end having been achieved.' ('Inter tertiam et sextam propter vicissitudinem, quam habent adinvicem, moderni similitudinem adauxerunt, quod sicut tres tertias se invicem sequi licet, ita et tres sextas, hoc ideo statuentes, ut cantus ille, qui per tertias et sextas imperfectus censeatur, non tamen discors aures trahat et allicit, ut perfectionem cantus, qui per quintam sequetur vel octavam, quarum tertie et sexte sunt nuntie et ancille, expectatam diutius indigent dulciorem, ut hic non autem hoc statuentes in quintis vel octavis, ne auris cesset ab advertentia, putans, quod habito fine cesset motus.') W. Frobenius, *Johannes Boens Musica und seine Konsonanzenlehre* (Stuttgart, 1971), p. 70.

APPENDIX 1

Jacques de Liège, *Speculum musicae*, Liber 4,
Capitulum L

SM, vol. iv, pp. 122–3. In the translation the letters in square brackets refer to Example 1 (see p. 116).

Concordiarum comparatio quantum ad cadentiam

[1] Antequam <consonantiae> concordantes, quantum ad cadentiam, comparentur, quid sit cadentia videatur.

[2] Cadentia, quantum ad praesens spectat propositum, videtur dicere quendam ordinem vel naturalem inclinationem imperfectioris concordiae ad perfectiorem. Imperfectum enim ad perfectiorem naturaliter videtur inclinari, sicut ad melius esse, et quod est debile per rem fortiorem et stabilem cupit sustenari.

[3] Cadentia igitur in consonantiis dicitur, cum imperfecta concordia perfectiorem concordiam sibi propinquam attingere nititur ut cadat in illam et illi iungatur secundum sub et supra, descendendo videlicet vel ascendendo.

[4] Quantum igitur ad cadentiam, una secunda sive tonus sub vel supra petit unisonum. Et similiter una tertia in semiditono. Sed una tertia in ditono petit quintum. Et similiter una quarta in diatessaron, aut petit unisonum, aut quintam. Quinta, scilicet diapente, propter bonitatem suam, tenet locum suum. Perficitur tamen in unisono aut in diapason. Sexta, scilicet tonus cum diapente, petit duplum vel quintam. Septima in semiditono cum diapente petit diapente vel diapason, ut praecedens. Octava, scilicet dispason [recte diapason], stat in se ipsa, non perfectibilis per aliam, nisi per unisonum. Nona, idest tonus cum diapason vel bis diapente, petit diapason vel in diapente revertitur. Decima in semiditono cum diapason petit diapason. Decima in

The relationship of concords with regard to *cadentia*

Before the concordant consonances are compared with regard to *cadentia*, it should be seen what *cadentia* is.

Cadentia, as far as it concerns the present matter, seems to refer to a certain order or a natural inclination of a more imperfect concord to a more perfect one. For it seems that an imperfect thing naturally inclines to a more perfect one, as if towards better being, and what is feeble wishes to be sustained by a thing that is stronger and stable.

Therefore *cadentia* is said to be in consonances, when an imperfect concord strives to reach a more perfect concord next to it so that it falls into it and is joined to it below and above, namely by descending or ascending [progression].

As far as *cadentia* is concerned, therefore, [a] a second or tone below or above seeks a unison. And similarly [b] a third consisting of a semiditone. But [c] a third consisting of a ditone seeks a fifth. And similarly a fourth in diatessaron seeks either [di] the unison or [dii] a fifth. A fifth, which is to say diapente, on account of its goodness, holds its place. However, it is perfected in [ei] the unison or [eii] the octave. The sixth, that is a tone with a fifth, seeks [fi] the octave or [fii] fifth. The seventh, consisting of a fifth with a semiditone, seeks [gi] a fifth or [gii] an octave, as the preceding. The octave, that is diapason, stands in and by itself, not being perfectible by another, except [h] the unison. The ninth, that is a tone plus an octave or a double fifth, seeks [ji] the octave or [jii] comes back

Jacques de Liège's Concept of *Cadentia*

ditono cum diapason petit duodecimam, scilicet diapason cum diapente, vel revertitur in diapason. Et consimiliter est de undecima, scilicet de diatessaron cum diapason. Duodecima autem, scilicet diapente cum diapason, quiescit in se ipsa, aut, ascendendo, petit quintam decimam, idest bis diapason, apud eum qui altam habet vocem, vel, descendendo, revertitur in diapason.

[5] Omnis igitur concordia non solum summe perficitur et quietatur in unisono et in diapason, sed etiam, si imperfecta sit ante perfectam, perficitur, cum ea, quae prope sunt, sint quasi idem.

[6] Unisonus autem et diapason, quia perfectissimae sunt concordiae, ideo finis principalis sunt discantum et organorum. Possunt tamen discantus in diapente terminari, quia saepe fit ubi unus supra tenore est discantus. Quodsi terminetur discantus unus cum tenore in diatessaron vel in alia praedictis tribus concordia, hoc rarum est.

[7] De concordiiis transcendentibus diapente cum diapason, mentionem non facio, quia propter ipsarum nimiam altitudinem raro vel nunquam in usu sunt. Habemus multas alias bonas quibus uti possumus et utimur.

to the fifth. The tenth of a semitone with an octave seeks [k] the octave. The tenth of a ditone with an octave seeks [li] the twelfth, namely the octave plus fifth, or [lii] comes back to the octave. And similarly it is [mi, ii] for the eleventh, namely consisting of a fourth plus an octave. Now the twelfth, namely the fifth and octave, rests in itself, or, in ascending, [ni] seeks the fifteenth, that is the double octave, on the part of him that has the high voice, or, in descending, [nii] returns to the octave.

And so every concord is not only fully perfected and calmed in the unison and octave, but also, if imperfect before perfect, is perfected, since those things that are close are more or less the same. Now the unison and diapason, because they are the most perfect concords, are for that reason the principal ending of discants and organa. Discants can end with a fifth, however, because this often happens where there is a single discant above the tenor.

Although a discant may end with the tenor at a fourth or at another concord from the aforementioned three, this is rare.

I make no mention of concords greater than a twelfth, because they are rarely or never used on account of their excessive height. We have many other good [concords] which we can and do use.

APPENDIX 2

Interpreting the Interval Progressions Exemplifying *Cadentia*

The interval progressions listed in the fourth paragraph of the chapter on *cadentia* and aiming to specify the location of the phenomenon in musical practice are ambiguous, stemming first of all from the question whether there is a requirement of contrary motion in Jacques's statements about *cadentia*; and secondly, if there is not this requirement, how widely the progressions may then be interpreted. Example 1 will be referred to in the

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The musical score is divided into three main sections: **Contrary motion**, **Similar motion**, and **Oblique motion**. Each section contains multiple systems of staves, with individual parts labeled 'i' and 'ii'. Some systems include a 'cont.' (continuation) line. The notation includes various intervals and rhythmic patterns, with arrows indicating specific intervallic relationships between notes.

Example 1 Interval progressions manifesting *cadentia* (SM IV. 1)

following discussion; it aims to represent each intervallically distinct realisation of the progressions of consonances referred to by Jacques. For reasons of economy, progressions using the melodic intervals of a tritone, diminished fifth, or any interval greater than a perfect fifth other than the octave have been excluded, though a glance through the repertory of Ars

antiqua motets will reveal that composers were not in practice limited by restrictions of this sort (and they are not stipulated by theorists of the time).⁸⁸

Sarah Fuller has translated the third paragraph of the chapter as follows: 'With respect to consonances, cadence occurs when an imperfect concord strives to attain the neighboring more perfect concord so that it falls into it, and is joined to it from below and above, that is in descending and ascending [i.e., contrary motion of the voices].'⁸⁹ On the face of it, this is a plausible translation; but it becomes questionable when set against what Jacques goes on to say. The very first instance that he gives is the progression of a tone to a unison from below or above, a progression that is most easily realised by oblique motion (though it can frequently be found in *Ars antiqua* motets following similar motion); it cannot be realised by contrary motion. I suggest that *vel* near the end of this sentence should be translated as 'or', indicating that any progression is either a descending or an ascending one, as is clearly the case for the tone progressing to unison. Then *secundum sub et supra* merely indicates that the progression proceeds by melodic movement of lower and upper voices.

This explanation works for oblique progressions, of which Jacques gives several (as well as the tone to unison there is the fourth to fifth, the major sixth to fifth, the minor seventh to octave and the ninth to octave), but apparently not for progressions by contrary motion. Further light is cast on 'by descending or ascending [progression]' by what Jacques says at the end of the fourth paragraph: 'Now the twelfth ... in ascending seeks the fifteenth, that is the double octave, on the part of him that has the high voice, or, in descending, returns to the octave.' Ascending and descending are again directly referred to here. The progressions could both be oblique, in which case the ascending and descending are simply the melodic movements of the upper voice. It seems more likely, however, that progressions by contrary motion would be included, in which case each progression is regarded as a whole as ascending or descending by reference to the upper voice alone (see Example 1: n). The advantage of this latter interpretation is that it enables Jacques's opening general remarks to be viewed as consistent with all of the examples that he gives, whether the voices move by oblique or by contrary motion – or, as may also be possible, by similar motion – the progression in each case being regarded as ascending when the upper voice rises and descending when it falls.⁹⁰ To

⁸⁸ Jacques himself refers to a motet (*Non peperit Deus nato proprio*) that employs intervals larger than an octave in its melodic progression: *SM* II. xliii; vol. iia, p. 42.

⁸⁹ Fuller, 'Tendencies and Resolutions', 230. Cohen's translation is similar, though he does not suggest that contrary motion is intended. Cohen, "'The Imperfect Seeks its Perfection'", p. 164.

⁹⁰ This interpretation renders the meaning of *ascendendo* and *descendendo* congruent with the following, less ambiguous passage from the *De discantu et consonantiis* attributed to Johannes de Muris: 'And other intervals, namely the semiditone and ditone, the tone with fifth make

maintain that contrary motion was a necessary part of Jacques's conception of *cadentia* requires that his general statement is contradicted by the specific examples he gives.

In addition to the oblique progressions, Jacques cites others by contrary motion. He gives the ones that are usually associated with the directed progression: minor third to unison (minor tenth to octave), major third to fifth (major tenth to twelfth), and major sixth to octave (Example 1: b, c, fi – also k, li). He also gives some progressions between perfect concords that fourteenth-century theorists tended to ignore: the fifth to unison or octave, the octave to unison, and the twelfth to double octave or octave (Example 1: e, h, n). His list is further expanded by fourteenth-century norms because of his different conceptions of concord;⁹¹ so he gives: the tone progressing to unison, the perfect fourth to unison or fifth, the minor seventh and ninth to fifth or octave (Example 1: a, d, g, j). While the progressions of the thirds, major sixth and minor seventh all proceed by stepwise contrary motion in both voices, and could thus be regarded as directed, those of the fourth, fifth, octave, ninth and twelfth can proceed variously in two or three different ways, and clearly could not be so regarded; in any case, two possible progressions are given for the major sixth and tenth. Yet, as no requirement for contrary motion is clearly stated, it is not clear that any of the progressions might not also be realised by oblique motion and (with one or two practical exceptions) by similar motion too (as the respective columns of Example 1 show). Jacques's preference for music of the *Ars antiqua* must be remembered in this connection, as the progressions that he describes may be readily exemplified in the repertory of that style.⁹²

imperfect consonance, because they tend to ascend or descend into the aforementioned perfect intervals, that is to say, the semiditone into the unison, the ditone into the diapente, the tone with fifth into the octave, by ascending or descending in turn.' ('Et aliae species videlicet semiditonus et ditonus, tonus cum diapente faciunt consonantiam imperfectam, quia tendunt ascendere vel descendere in speciebus praedictis perfectis scilicet semiditonus in unisono, ditonus in diapente, tonus cum diapente in diapason, ascendendo vel descendendo seriatim.') *Scriptores ecclesiastici de musica sacra potissimum*, ed. M. Gerbert (St Blaise, 1784), iii, p. 306.

It seems here that the minor third is thought to ascend into the unison, and the major third and major sixth to descend respectively into the fifth and octave, following the melodic movement of the lower voice. This is, then, the same principle of description as Jacques's but following the lower rather than the upper voice.

⁹¹ Fuller, "Delectabatur in hoc auris", 471–2.

⁹² His examples may be compared with the interval progressions given in the *Discantus positio vulgaris*, to demonstrate the continuity of Jacques's musical thinking with that of the thirteenth-century Hieronymus de Moravia, *Tractatus de musica*, ed. S. M. Cserba, 2 vols. (Regensburg, 1935), ii, pp. 191–2. See also Fuller, 'Organum – *discantus* – *contrapunctus*', pp. 487–8.