

Music as Communication: Networks of *Composition*

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July 2008

Abstract

Music communicates. In composing, performing and listening to music, humans interact, expressing and sharing an infinitely wide range of ideas, emotions and issues. It would be impossible to contain that sheer diversity in words, let alone a single volume. Accordingly, this thesis addresses questions of how the communication process occurs, through in-depth analysis of specific pieces. By and large, in Western musical culture, listening is the medium through which information is passed from composers to audiences, and rather than map out the conditions under which communication might be said to take place, this study takes ‘the music itself’ – the perceptual experiences offered through sound – as its starting point.

Following the dissolution of tonality, twentieth-century composers had to find new ways of organising – positioning – sound(s): different ways of presenting musical information. The works chosen for study are iconic pieces by Berio, Crumb, Debussy, Ligeti, Stockhausen and Stravinsky, as well as more ‘conventional’ examples, taken from Mozart and popular music. Each one is a distinctive (and influential) manifestation of music as communication, and the present approach lies in deriving appropriate analytical responses to the listening experience under consideration.

Inevitably, and inherently, music is understood from varied perspectives, and such diversity can only be unified to a certain extent. A common feature of all these pieces, and all those perspectives, is that they offer listeners opportunities for perceiving relationships between realised, remembered and imagined sounds. Those (potential) musical connections are, in effect, networks of *composition*. The idea of networks has obvious import for communication in the internet age. Central to it is the potential for expansion and flexibility: it is open to perpetual redefinition. Networks provide a means of conceptualising, and understanding, music as communication.

Acknowledgements

This research was made possible by an award from the AHRC, for which I am very grateful. In addition, there are many others to whom I am indebted. The University of York Music Department has enabled me to develop into a thinking musician. My experiences here as a scholar, listener, performer and composer have never failed to open my mind, and long may that educational tradition continue. Particular fellow students should be noted. I would like to acknowledge Christian Mason for our unique conversations exploring ideas, music, and relations between the two. I should also like to thank Isobel Davies, whose enthusiasm for my research came at a critical time, and substantially boosted my own.

Close friends have provided invaluable companionship throughout the project, and I would especially like to thank Alex Rotherham and Ian Mayer, Alice and Ned Potter, and Matt Dibble for their longstanding support and encouragement. I have had many valuable discussions about my thesis with my friend and colleague Mike Rofe, and I am particularly grateful to him for his technical help in the latter stages of bringing it to completion.

I owe an inestimable debt of gratitude to my parents, and my brother Tom, for their constant love and generous care, their unfailing belief in me, and for the inspiration that they continue to provide.

Most of all, I must thank my supervisor, Tim Howell, for his unremitting support and encouragement throughout my period of study. His enthusiasm for discussing and exploring my ideas enabled me to develop them into the present thesis, and I am privileged indeed to have worked under his supervision.

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Section 1

Music as Communication

Chapter 1

Introduction

Networks are the language of our times. Think about Al-Qaeda. The internet, eBay, Kazaa. The mobile phone, SMS. Think about iron triangles and old school ties, No Logo and DeanforAmerica. Think VISA and Amex, the teetering electricity grid, the creaking rail network. LHR to LAX. Think about six degrees of separation. Think small worlds, word of mouth.

Think about your networks. Your friends, your colleagues, your social circle. How new networks take shape through introductions at parties, over coffee breaks, via email. How your connections have helped you, supported and hindered you.

They are all around us. We rely on them. We are threatened by them. Networks shape our world, but they can be confusing: no obvious leader or centre, no familiar structure and no easy diagram to describe them. Networks self-organise, morphing and changing as they react to interference or breakdown.

Networks are the language of our times, but our institutions are not programmed to understand them.

As individuals, we have taken advantage of the new connections: to earn, learn, trade and travel. But collectively we don't understand their logic...

(McCarthy, Miller and Skidmore, 2004: 11)

At the start of the twenty-first century, it is difficult to spend twenty-four hours without coming into contact with networks of one kind or another. They are so essential to everyday life that they might even be considered a definitive part of every individual; people's identities can be understood as of a set of links between the things they do and roles they play. As the quotation suggests, they can be manifest in a seemingly infinite variety of ways; and the beauty and power of the concept is its openness to interpretation. Furthermore, they are capable of adapting to threat. 'morphing and changing as they react to interference and breakdown'. It seems they resist containment: and accordingly, rather than try to derive a fixed, closed definition, this thesis seeks to celebrate that diversity, using the concept of a network to open up understanding.

Another similarly ubiquitous and essential experience is music. Like networks, it is an important part of everyday life, and can be central to people's identities. Again, it is difficult to imagine twenty-four hours passing without coming into contact with music. Due to late twentieth- and twenty-first-century technological advances, particularly as regards portability and accessibility, music from any time or place can be reproduced easily at practically any other time or place. In accordance with this breadth of origin and application, music itself is also highly flexible and open to continual redefinition. Arguably, the outputs of many composers seek to explore the premise that 'anything can be music if it is heard as music' (Cook, 1990: 12) – John Cage is but one iconic example.

With a view to beginning to contain these seemingly limitless concepts, it is worth explaining the motivation behind this thesis. Personally, my musical identity was formed in a number of different spheres. I have had experience of church music as a cathedral chorister, songman and local church organist; of playing the oboe in youth orchestras, symphonic wind bands and chamber groups; of conducting various student ensembles here at York (often – due to the quality of the players – to a high standard of performance); of playing and singing throughout Britain and abroad in rock and pop groups; and of playing jazz piano in both small groups and big bands. I also have a longstanding interest in composition, having written music in all of these three styles – jazz, rock and 'classical'. Inevitably, my interest in composing comes with a fascination with contemporary music. As an undergraduate student here I was exposed to so much new music and (what were then, for me) new ways of thinking about it, that 'music' was redefined at least once every twenty-four hours.

I exaggerate, of course, but my activities here as a performer, listener, composer and scholar have always challenged my understanding, in particular as regards the ways in which they might be connected. For example, during the three years of my PhD I realised that analysing contemporary scores (albeit at a relatively surface level) as a conductor can have a huge effect on how materials can be presented to players in rehearsal. Having an understanding of large-scale musical shapes and how they relate to smaller ones enabled me to explain how the parts played by individuals contributed to the ensemble, and players reacted well, as they understood (something of) the meaning of their part – why they were doing what they were doing. By extension, at some level, musical analysis can have an impact upon rehearsal schedules; on certain occasions, particular parts of the whole are not required. Hopefully, my conscious application of score-based analysis to the performance process demonstrates something about my attitudes as a musician and scholar. Meyer quotes Cohen: ‘ “...anything acquires meaning if it is connected with, or indicates, or refers to, something beyond itself, so that its full nature points to and is revealed in that connection.” ’ (Morris R. Cohen, *A Preface to Logic*, quoted in Meyer, 1967: 6)

I do not mention my musical past to distinguish myself – doubtless the first year (at least) of every undergraduate degree is a mind-expanding experience, and surely, every conductor is an analyst to some degree. The point I’m trying to put across is that even beyond the walls of a progressive university music department like York (with its longstanding traditions of composition and new music), contemporary musical culture is marked by plurality. Accordingly, my motivation in writing this thesis is to explore that

diversity, by trying to find ways of considering how different musics might be related, over as broad a range as possible.

Inevitably, certain limits must be imposed, as will become clear, both in terms of the choice of repertoire and in the ways in which it is discussed. Importantly, however, the intention is not to deduce a new, grand theory of communication and impose it on music, nor to apply an already extant one from another discipline. No consistent analytical method is applied, nor a new one proposed or devised. Instead, research has been carried out first and foremost by listening, reflecting, and rationalising that experience in consultation with the score. The starting points for investigation, both in the thesis as a whole and within each case-study chapter, are manifest as two analytical attitudes, which take the form of ‘taken-for-granted’s’. Firstly, it is presumed that music communicates, and secondly, that communication occurs in and through networks. Thus, the onus is on me as a listener and an author to try to perceive and explain how that process occurs; how music offers listeners the opportunity to interact with networks of different kinds, and the meaning(s) which might be transmitted as a result.

Communication and Music

Meyer

The idea that music communicates is, of course, nothing new. For millennia, philosophers, music critics and teachers, composers, and later musicologists, music theorists, music psychologists and scholars in other related – and sometimes unrelated – disciplines, have discussed how the information presented by music might be understood

to be meaningful. Potentially, there is an infinite literature on this subject. A seminal twentieth-century book to have discussed the communication process in music is Leonard B. Meyer's *Emotion and Meaning in Music* (1956). Among other things, his work is an important meeting point for music theory and psychology, as he successfully applies Gestalt laws of perception to musical listening. Indeed, his ideas are discussed, to the point that they are influential, in a great deal of the literature of both disciplines (see Clarke, 1997: 8; Cook, 1994: 64; Deutsch, 1999: 355-6; Krumhansl, 1990: 19-20; Lerdahl and Jackendoff, 1983: 7; Narmour, 1977: 136-44; Sloboda, 1985: 64-5).

Many potent ideas are set out in *Emotion and Meaning in Music*, although it is the central argument that has held the most sway for subsequent generations of scholars. Meyer explains that 'understanding is ... a matter of grouping stimuli into patterns and relating these patterns to one another' (Meyer, 1956: 6). Thus, the meanings understood in music lie in the implications of, and the manner in which, that grouping and pattern-matching process occurs. On account of the laws of Gestalt Psychology, which state conditions for well-formedness in perceptual stimuli, certain combinations of musical events arouse expectations in the minds of suitably qualified listeners; having recognised the beginnings of a pattern, listeners 'have reason to believe' (albeit often at an unconscious level) that it will eventually be completed, provided they are appropriately enculturated to group stimuli into meaningful patterns.

Those expectations of completion may or may not be satisfied, depending on whether the emergent musical patterns conform, and listeners' reactions to this are what bring about *Emotion and Meaning in Music*. The former arises because the tendency to react psychologically to completion may or may not be blocked (depending on whether or

not a pattern is recognised as having been completed satisfactorily), which gives rise to an emotional response (Meyer, 1956: 14); the latter, because, as a given pattern is formed through time, it might imply a particular mode of continuation in order to attain satisfactory completion – it is thus imbued with a significance, or meaning (ibid: 35). Thus, as stimuli are grouped into patterns, they become somehow connected in the minds of listeners, and music communicates through such imagined connections between events. This notion is the fundamental premise of this thesis – it is through connections (and disconnections) that networks are formed.

Cook explains that Meyer ‘sees aesthetic perception as being largely moulded by the nature of the listener’s expectations, and he sees these expectations as being themselves largely moulded by the musical culture to which the listener belongs’ (Cook, 1990: 143). Importantly, the in-depth examples used to demonstrate the theory in *Emotion and Meaning in Music* all belong to the Western tonal tradition. Thus, to some extent, it is taken for granted that the listeners about whom Meyer writes are familiar with traditional patterns of harmonic tension and release. However, from the early twentieth century onwards, Western composers have written music which does not conform fully to those conventions, and this begs the question of how communication takes place in these pieces. Arguably, since they are considered to be significant works, the perceptual connections which they offer to listeners ought to be explored. Having been received into culture, the patterns in twentieth-century music have surely influenced the communication process.

Semiotics I: Roots

This thesis cannot be complete without acknowledging semiotics (or ‘semiology’), the general theory of communication, or, etymologically speaking, the science of signs. As Dunsby and Whittall put it, semiotic theory ‘claims that in perception and communication we know things because of the way they relate to other things, rather than solely because of any intrinsic properties they may have’ (Dunsby and Whittall, 1988: 212). Thus, anything which can be perceived is potentially a ‘sign’, which might orient the perceiver to understand a particular meaning. Unsurprisingly, given the manifold ways in which information can be manifest and transmitted, it is difficult to define semiotics as a discipline; the term is used to refer to a wide range of literature and intellectual pursuits, with a vast number of potential subjects for study. Reflective of this diversity, there are two independent roots of semiotic thought. The Swiss linguist Ferdinand de Saussure, who, using the term ‘semiology’, developed a way of analysing language, considering the relationships between words (‘signifiers’) and the things to which they refer (‘signifieds’). Quite independently, Charles Sanders Peirce – an American philosopher and contemporary of Saussure’s – developed his own semiotic thought, taking a far broader view of what might constitute a sign.

These Peircian and Saussurian roots might be described respectively as ‘referentialist’ and ‘structuralist’. Writing which adopts Peirce’s thought is generally concerned with the semantic meanings to which signs refer, and the nature and implications of how that process occurs. By contrast, as Saussure was concerned with the structure of language, the literature arising from his ideas tends to discuss issues of syntax: how signs function as structural units within texts to bring about meanings and

implications. As the ideas of these two men have been developed by later twentieth-century thinkers and applied to many different things, the distinctions between them are far less clear. Semiotic literature is united, however, by a consideration that communication takes place through 'signs' (which collectively make up 'texts'), which orient people to particular meanings.

Semiotics II: Nattiez

The most direct application of Saussurian structuralist thought to music is Jean-Jacques Nattiez' paradigmatic analysis. Nattiez divides musical communication into three 'levels': the 'poietic' level, at which composers create texts; the 'esthetic', at which listeners understand meanings arising from those texts; and the 'neutral' level of the text itself. The argument is that human intentionality exists at the former two levels, meaning that communicative values cannot be considered in terms of their objective function. Thus, a scientific understanding of communication can only be gained by analysing the text itself, in a counter-intuitive way (hence, the *neutral* level). Arguably, there is a flaw in this – as a human act, analysis always involves intuition at some point – although the strict emphasis on systematic decisions in Nattiez' method seeks to overcome this. Those decisions involve devising a set of rules which enable a piece to be segmented into signifying units, or 'paradigms' (these are usually melodic or rhythmic motifs). After the musical surface has been divided in strict adherence to those rules, the various segments are placed in a table, which illustrates their temporal distribution. Thus, the rules governing that 'syntagmatic' arrangement of the paradigms – the building blocks of the

text – can be discovered, which, notionally, uncovers something of how the music passes on information – how it communicates – overall.

For all that it has to offer, Nattiez' approach to analysing music is not adopted in this thesis, for two important reasons. Firstly, as mentioned above, its emphasis on a scientific, 'objective' approach seems out of keeping with the actual experience of listening to music. On the one hand, an important function of analysis is to consider the mechanisms underlying musical intuition, although on the other, to attempt to deny the role of intuition in music as communication is manifestly wrong: listening and all other musical activity is inherently intuitive at some level (poietic, esthetic, and indeed 'neutral').

Secondly, the requisite conditions for paradigmatic analysis are somewhat restrictive, for two, specific reasons: the method requires that the music involves *repetition*, such that it can be *segmented* into signifying units. Much of the repertoire discussed in this thesis plays upon precisely these two features of perception; in twentieth-century music, what may or may not constitute repetition, and those events which might be perceived as separate or conjoined, often have an inherent ambiguity which is central to the nature and content of the communication process. Thus, with a view to discussing a wider repertoire, Nattiez' method is not used here.

Semiotics III: Peirce, and Topics in Monelle

In contrast to the inherent restrictions potential of paradigmatic analysis, semiotics derived from Peircian thought can be applied to a hugely diverse range of topics. It is beyond the present scope to go into his theory in any depth, although a mere outline of its starting points is sufficient to demonstrate its vast potential¹. For Peirce, there were three types of sign:

Iconic signs *resemble* their object, as a silhouette of a man with a spade may mean “road up”... Symbolic signs depend on learned cultural codes [here, Peirce’s thought resonates with that of Saussure]; thus, the word “tree” has nothing in common with a tree, but is understood by a speaker of English to carry this signification...

...the third Peircian concept of *index*, [is that] a sign...signifies by virtue of contiguity or causality, as when a hole in a pane of glass brings to mind the bullet that passed through it and caused it.

(Monelle, 2000: 14-15;

italics in original;

comments in square brackets added)

It is easy to imagine examples of how these types of sign function in music. Monelle goes on to say that ‘the musical imitation of a cuckoo is the most literal icon of all’ (ibid). Immediately afterwards, he proceeds to point out the ‘symbolic ramifications’ of this orchestral birdcall, which arise because, having been used by numerous composers, at some point it took on meaning as a *conventional* signifier, such that it communicates ‘cuckoo’ through a learned, cultural code (a convention). In addition, Monelle quotes Karbusicky (ibid), who makes the point that this musical imitation need not necessarily signify merely the call of a cuckoo but might also imply the arrival of spring, thus functioning indexically as a contiguous link is made between the time of year and the birdcall.

¹ A discussion of Peirce’s ideas in relation to music can be found in Monelle, 1992: 193-200.

Monelle's point is that the categories 'icon', 'symbol' and 'index' are often not nearly as clear-cut as they might appear: arguably, the two-note 'cu-ckoo' motif functions within all three. Certainly, Peirce's ideas have been transcended by later commentators, although his influence is still clearly felt and acknowledged (Cumming 2001: 66-7). Undoubtedly, the enduring adaptability of his theory lies in the concept that signs function beyond spoken and written language, throughout nature and culture. Inevitably, considering as diversely interpretable a concept as 'music' in terms of how it relates to as infinite a context as 'the other parts of culture and nature' opens up plane upon plane of potential subjects for discussion. Raymond Monelle's (2000) semiotic essays, collectively entitled *The Sense of Music* (and cited above), provide particularly penetrating and wide-ranging discussions of numerous issues in twenty-first-century musical semiotics.

The first part of the book is devoted to topic theory. The effect of a (functioning) musical topic is that, on hearing a particular signifying unit, listeners are oriented to particular semantic (or, in looser terms, 'extra-musical') meanings. Many interconnected examples are discussed: the associations of military bugle calls with hunting and soldiering (ibid: 33-40); the galloping rhythms of horses and their attendant associations, again with hunting and the military, although also in that connection, with nobility, masculinity, heroism and adventure, and their cultural attachés, such as the outdoors and bravery, which lead to further topics such as nocturnal woodland myths (ibid: 45-66); the *pianto* – a descending-semitone falling-tear melodic motif (ibid: 66-73); and its extension to a chromatically in-filled fourth, the *passus duriusculus* – 'an infinity of laments' (ibid: 73-77).

Topical signification operates on a far more sophisticated basis than, for example, the idea that a compound-time ‘tum-ti-tum-ti-tum’ rhythm mimics its object – a galloping horse. Rather, musical topics are rooted (albeit floatingly) in cultural history.

The central questions of the topic theorist are: Has this musical sign passed from literal imitation (iconism) or stylistic reference (indexicality) into signification by association (the indexicality of the object)? And, second, is there a new level of conventionality in the sign? If the answers are positive, then a new topic has been revealed...

(Monelle, 2000: 80)

A Sense of Music cites examples from literature, political and military history, and the visual arts to explain, in some depth, how people’s conceptions of warfare, hunting, and the role played by horses in both, evolved over time. Inevitably, the changes in ideas about those activities had an impact upon the presentation of the equine topic in music: as members of a culture, composers’ conceptions are subject to cultural conditioning. Monelle demonstrates how compositional decisions might have been influenced by the particular historical associations of the horse that composers wished to invoke, by making reference to earlier compositions (of their own, or of others).

According to Monelle, ‘Each topic needs a full cultural study. There is much work here for future doctoral programs.’ (ibid: 33). Presently, such work must remain a future venture. For all that it has to offer in terms of links between music and other parts of culture, this approach is not explicitly adopted in this thesis (although certain of the ideas presented in Chapters 4, 7 and 8 certainly resonate with topic theory). Instead of tracing the appearances and evolution of particular musical materials through history, the present approach is rather more applied. Just as for the strictly counter-intuitive nature of paradigmatic analysis, a criticism which might be levelled at topic theory is that, far from delving deeper into the musical communication process, inevitably it steps outside it, in

order to comment. On the one hand this might be seen as a positive attribute, enabling an objective viewpoint, whilst on the other, it might be argued that the insider-outsider identity crisis and rigorous labour demanded by such semiotic pursuits breed a certain academic neurosis.

As a first principle... the theorist of music must examine the culture and society in which it is embedded. There she will find literary and iconographic traditions; it would be most surprising if these were not reflected in music. Many of these will be connected with social practices and processes. So, first of all, the semantic constellations of musical topics must be shown to match literary and cultural topics which are, in their turn, related to aspects of society; ... Such realities cannot be merely assumed or guessed; we must study the literature, drama, and social history of the period in order to interpret the music.

(Monelle, 2000: 228)

All of this – uncovering culturally-embedded semantic constellations of literary, iconographic, cultural and musical topics and their relations to one another and to social practices, merely as a *first* principle – to know a cuckoo when you hear one?! Certainly, all musical experiences happen within cultural contexts, and those contexts have an impact upon the meanings transmitted. However, surely, it is not necessary to be conscious of the vast wealth of information offered by this type of study in order to understand the significance of a simple galloping rhythm or bugle-call, however ironically intended it may be. Of course, this is a gross exaggeration of what Monelle is implying: he is addressing music scholars, rather than listeners. My facetious tone arises out of a difference of attitude and intent, rather than out of a lack of respect for semiotics. This thesis is very much about how the perceptual processes at work in the listening experience, rather than how the compositional ancestry of musical materials, play a part in the communication process.

The essays in *A Sense of Music* cover issues above and beyond topic theory, however. Broadly speaking, towards the end of the book, the subject for discussion is subjectivity. Chapter 7, ‘Mahler and Gustav’, is, or so the title would suggest, devoted to the music of Mahler – a particularly intriguing case given his penchant for quotations of different kinds. The argument is that the composer’s ‘voice’ does not speak clearly through the music (specifically in this case, the fourth movement of the Second Symphony, a setting of the *Wunderhorn* poem “Urlicht”). The chapter ends:

Behind the many subjects which speak through this movement, there must, presumably, be a single voice which links them all in a compassionate message. This is Cone’s “complete musical persona”, who “is by no means identical with the composer” but “constitutes the mind of the composition in question”. Or perhaps it is “Gustav”, the artist’s creation and reflection of himself, parallel to the “Marcel” who narrates Proust’s long novel. “Marcel” is not Proust; he is somewhat like Proust, fastidious, snobbish, but he is not gay or Jewish. In Mahler’s case, the difference is much more striking. His crass programs to the symphonies, always written *ex post facto*, make nonsense of the music’s elusiveness. About “Urlicht” he said: “The moving voice of naïve faith sounds in [the hero’s] ear.” Undoubtedly Mahler believed, in a superficial way, in these trivial utterances, but his habit of stepping back into anonymity, of becoming a “listener” – his *Wunderhorn* habit, it might be said – allowed the obliqueness and irony of his imagination (of Gustav’s imagination) to enter through the open door. To be sure, the symphonies are full of Gustav, with his tricky elusiveness, his dubious sincerity and his chameleon nature. Mahler is, on the whole, absent.

(Monelle, 2000: 194-5)

Clearly, the issue of who is communicating with whom plays an important role in the transmission of meaning in Mahler’s music, and semiotic considerations (stemming this time from Barthes’ ‘Death of the Author’ (see Monelle, 200: 158ff)) can provide the tools to answer those questions in terms of interactions between the various ‘meta-subjects’ and ‘-subjectivities’ at play in the work.

In order to stay focussed on the perceptual listening experience, a simple (indeed, simplistic), everyday interpretation of the facts of the communication process would be applied in this case: listeners attend a concert, or play a recording of Symphony No. 2, by the composer, Gustav Mahler, performed by an orchestra with voices. Inevitably, such a reading would be clumsy if it were pursued, given the emphasis on subjectivity in Mahler's music (hence the absence of that composer from the thesis), although the simple composer-performer-listener chain is assumed and consistently applied in each chapter. With a view to concentrating on music rather than semiotics, discussions of subjectivity, although at times implicit, are not to be found in an explicit form here.

Undoubtedly, the fourth chapter of *A Sense of Music*, 'The Temporal Image', is the most relevant to this thesis. Summarising that chapter at the end of his book, Monelle says that musical structure is an indexical sign in which 'cultural temporalities are perforce reflected' (Monelle, 2000: 228). The argument is that, since music – a temporal art – is a product of culture, the way it behaves through time must somehow be informed by, and be representative of, the way people conceive time (the temporality) within that culture. Citing philosophical writings, which in turn refer to theology, Monelle traces the way people in the West thought about temporal structures, starting with those living in Medieval times and moving through to those of the Eighteenth century (ibid: 93-6), an era which 'enhanced the moment by filling it with sensations; but it also joined the present to the past in the form of memory, by placing these sensations in a frame in which time passes' (ibid: 96). Thus, the 1700s were bichronic – two temporalities were conceivable: at different circumstantial instants, people found themselves in passing time.

whereby 'pasts' were joined with 'presents': or they existed *in* the present, wherein time was, by comparison, static, such that sensation could be experienced.

Monelle argues that these two temporalities are manifest in music as lyric time – symmetrical, or at least regular, four-bar phrases, whose recurrence implies in-the-moment stasis; and progressive time, in which processes such as modulation, occur over longer periods, and through phrase boundaries. He cites the keyboard music of Bach as having reconciled the two in microcosm (ibid: 98-100), and the alternations of *Sätze* (semantically meaningful, thematic material) and *Gang* (semantically cool, transitional passages) in the Classical sonata as having developed a dialectic between the lyric and the progressive (ibid: 100-113). This is of particular interest here: the role played by musical time in enabling (and sometimes hindering) listeners' engagement with perceptual networks is discussed within each individual chapter of the thesis. In Chapter 2, the discussions of sonata form and certain other ideas resonate particularly closely. However, rather than take a historical viewpoint of the evolution of twentieth-century musical temporality, each of the pieces in the repertoire discussed here is treated as a separate listening experience.

The above discussions of the work of Nattiez and Monelle do not constitute a comprehensive survey of musical semiotics. Together, however, these authors offer two very contrasting approaches to understanding how signs function in music, which, from a certain point of view, represent opposite extremes within semiotics. Paradigmatic analysis, with its fervour to be scientific, seems to deny the crucial role of intuition in listening – one which is surely central to any communication which might occur in musical experience. Thus, Nattiez' structuralist approach is, to some extent, concerned

with looking *into* the score, perhaps so far as to look beyond what, or more specifically, how, it might mean. By contrast, Monelle – a referentialist – faces the other direction: he looks away from music for its meaning. As explained above, the mission he sets for music theory seems to suggest that anybody studying music must first know everything about the circumstances in which it was created before even trying to consider actual scores, performances and so on. There is, of course, an implicit appeal for specialisation, one to which this thesis does not respond.

The present aim is to try and find a way of discussing as wide as possible a range of music in accordance with the diversity of musical culture, as explained at the outset. Neither a wholly inward-looking, score-based approach, nor a wholly outward-looking, music-in-cultural-history one is taken here. Rather, the attempt is to follow a middle path: to ground the study in the listening experience. Inevitably, there are score-based examples, and these are balanced by discussions of off-the-page issues, although the point is always to consider how such explorations might impact directly on the experience of listeners in concert settings.

Music *as* communication

Critics often distinguish successful concerts by suggesting that musicians ‘communicated’ well with their audience, seeming to imply that somehow they went beyond merely playing or singing the programme. Such a performance might well have involved ‘expressive’ playing, a notion clearly related to communication although hard to define, perhaps implying the instrumentalists’ heightened control over, and apt judgement

of the sounds they made. Arguably there are other factors, however. Davidson (2005) analyses the role played by 'Bodily Communication in Musical Performance', for example. As well as considering musical theoretic issues, the impact of visual presentation of the pieces under consideration is also considered: the spatial layout of the stage; the actions of the performers; indeed, in one case, the absence of performers is discussed. Arguably, all of these things are sources of musical information, from which listeners might deduce meaning. Before departing from issues of 'communication', and with a view to defining the present subject for debate further, it should be acknowledged that the term is also used in connection with music in disciplines beyond music theory.

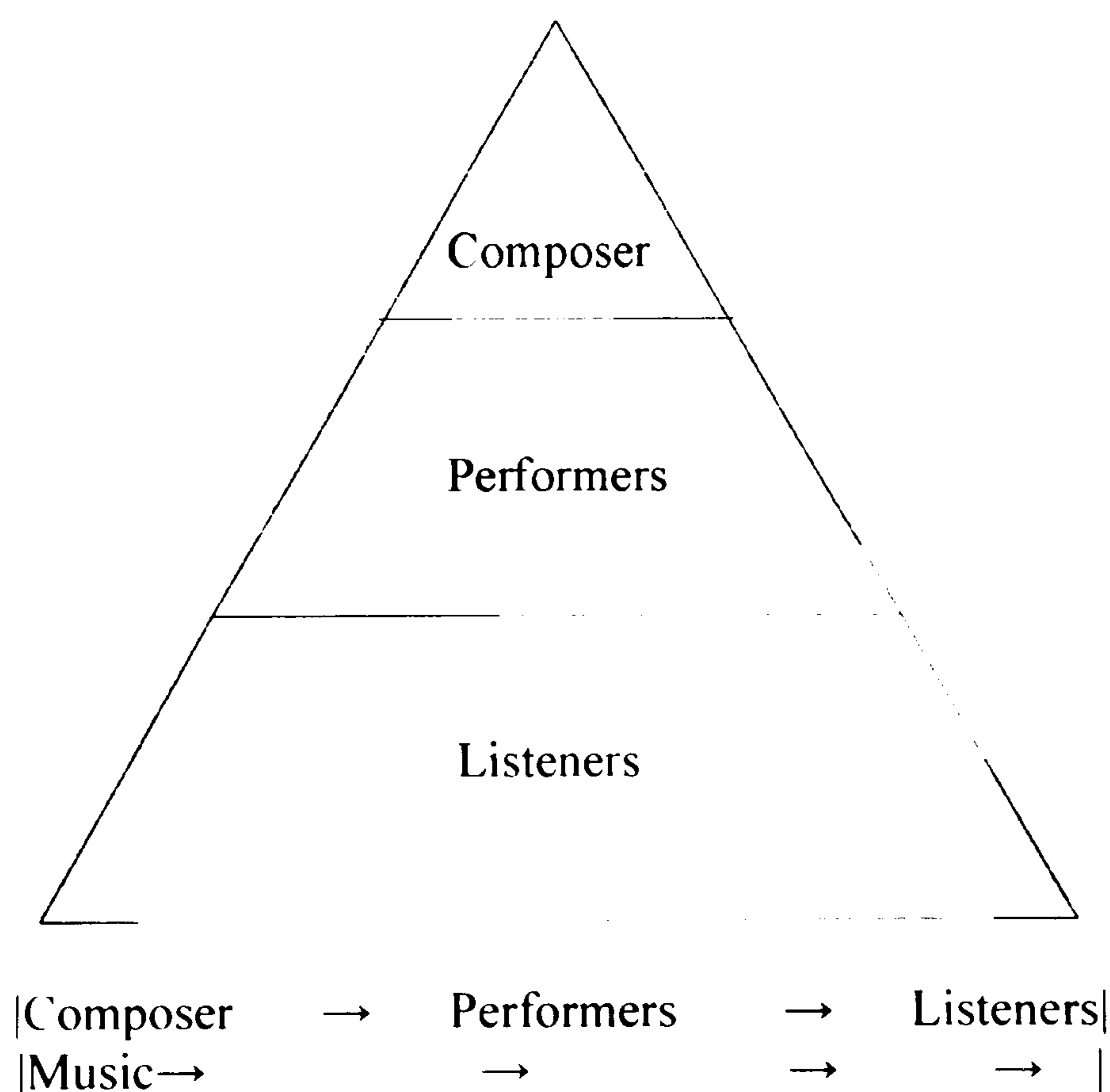
Outside the concert hall, for people with disorders of communication, participation in music can provide a vital link with the outside world; at times it might be the only medium through which they can interact with others. Indeed, 'for music therapists today...communication is the...therapeutic aim' (Ansdell and Pavlicevic, 2005: 194). In an everyday sense, away from such 'specialised' circumstances, even seemingly passive involvement can be considered as communicative activity. For young people, musical taste can play a role in determining the peer-groups with which they associate, and therefore it can influence their social attitudes and behaviour and presumably, by extension, the clothes they wear, the people they find attractive and those they wish to attract (Hargreaves and North, 1999). Thus, as mentioned above, simply listening to a given kind of music can play a role in the communication and production of identity.

Broadly speaking, the latter two settings – music therapy and youth culture – exemplify music as an agent for communication between people with particular, directed agendas (whether conscious or otherwise) – in the case of the therapists and their clients,

interaction; for the youths, identification and expression of self. These are examples of the roles played by music *in* communication. They demonstrate two ways in which that art might support the exchange of messages between humans. This thesis concerns music *as* communication; the idea that the sounds of music themselves might provide, indeed be, potentially meaningful information. Thus, of the examples given above, discussion is most closely related to the concert performers, whose agenda, broadly speaking, is aesthetic rather than functional. Fundamentally, their aim is to play to non-participant listeners, who observe rather than actively join in, responding only with applause at appropriate points.

Such concert etiquette is typically connected with an old-fashioned, hierarchical paradigm for the communication process in music, represented below (a simplification of the situation described by Cook, 1998a: 17).

Ex. 1.1:



As Cook explains, this old order dates back to early nineteenth-century Europe, and has its roots in ideas surrounding the reception of the music of Beethoven (ibid: 24). Moving downwards through the hierarchy, the population drastically increases: many more people have heard the music of Beethoven than have performed it, and of course only one man wrote it (however many editions it has been filtered through). Thus, in this model, the composer is superior to the performers and listeners, being, the only active, decision-taking member of the chain. He decides what the ensemble should play, and thus what the audience should hear. Remembering that this paradigm predates recorded sound, music has the status of a highly valued commodity; because it can only be heard in live performance, its implied rarity intensifies its meaningfulness as information, indeed as specialist knowledge which is disseminated downwards from the 'generator of the core product' (ibid: 24).

Inevitably, Ex. 1.1 is inadequate as an expression of twenty-first-century musical experience, and its anachronism fundamentally lies in one problem, as the model implies a strict separation between the three roles it demarcates. In fact, even 200 years ago, this conception did not apply: Beethoven himself is an example of a performing composer; perhaps more tellingly, listening is and was inherent to both composition and performance; essentially, the three activities feed back into one another as musicians are influenced by the music around them. Composers often consult performers, and improvisation has always meant that performers play a somewhat 'compositional' role.

In contemporary culture, the countless approaches to creating music – using computers to generate structures, compositional collaborations, and the fusion of disparate musical styles and traditions are but three obvious examples – often mean that

this Western ‘division of labour’ does not apply. The barriers between composer, performer and listener are perhaps more blurred than ever now, and not just in high-art contexts: arguably, night club DJs carry out all three roles, for example.

Where previously music was a commodity, in the twenty-first-century West it is treated as a resource, like water, for example. In the twentieth century, people would go and buy records, tapes, and later, CDs from shops, complaining at the extortionate profits made by record companies. Nowadays practically any .mp3 can be downloaded at any time of night or day for virtually no money², as if it were coming out of a tap. Music is in endless, instant supply. From one point of view, listeners have never had it so good, although there is a downside. Arguably, the proliferation and ubiquity of musical experiences has devalued the currency. For example, there are many everyday situations in which people are subjected to background music over which they have no control – the musical equivalent of rain or drizzle perhaps, only without the chance to remember an umbrella! In spite of this, a notable development of the last 100 years has been the empowerment of listeners, since by and large it is they who have authority over their engagement with music. Effectively, the pyramid has been turned on its head: listeners control where, when and how a work is received, rather than the composer’s work controlling the way they listen.

In considering how music communicates it is important to note the empowered status of listeners in a post-iPod world, although none of these ideas get to the heart of the matter. However much control individuals might have over their listening experience, the

² As I write, it costs £0.79 to download a single song from iTunes – only 14 pence more than a bottle of water in the local supermarket.

readings they can infer are necessarily constrained by compositional decisions as to the sounds used to create the music. With this in mind, the pieces chosen for analysis here are all ‘traditionally composed’ in the sense that they were all conceived and notated by one individual³, in order that they might be realised by performers and heard by an audience. The questions asked of each one concern how the decisions taken by the composer might influence what listeners can take out of the experience; how it is possible to consider the process through which meaningful information passes from the composer to listeners, as communication.

Composition

What composers do

There are precisely as many different approaches to composition as it is possible to imagine. Indeed, the impossibility of containing such a huge subject in words alone is demonstrated by the music of experimental composers such as Cage, whose work often probes, expands and questions their role. What follows is not an endeavour to define limits or conditions for what may or may not be considered an act of ‘composition’. Rather, the intention is to consider how the meaning of that term might relate to the composer’s role as communicator.

The verb ‘to compose’ has its roots in the Latin ‘(com-)ponere’, meaning ‘to put’, and to expand upon this, composition is ‘an act or method of putting together into a whole’ (Hawkins, 1986: 177). (Needless to say, the dictionary also defines both words

³ A single, minor exception can be found in the brief discussion of popular music (see Chapter 6).

with direct reference to music, although in necessarily general terms which take the present philosophical discussion of the communication process for granted, and so those meanings are not helpful here.) These basic definitions can be taken to relate to communication in two ways. Firstly, composers are engaged only in putting things *to* listeners so, ultimately, they have no control over how audiences perceive their *output*). Secondly, that they put *together* carries the implication that they present a number of sounds as related, rather than as independent events. At a fundamental level then, the composer's role in communication is to put relationships between sounds to listeners.

There are no great mysteries in understanding how, by writing music, composers fulfil their role. Indeed, it is difficult to see how they can avoid putting relationships between sounds to listeners – but this raises the important question of *where* they put them. The emphasis added to the term '*composition*' in the title of this thesis refers to a particularly powerful idea regarding music: that it exists as an object in its own metaphoric space. Thus, composers place sounds in different positions relative to one another and they create networks of *composition*, in musical space.

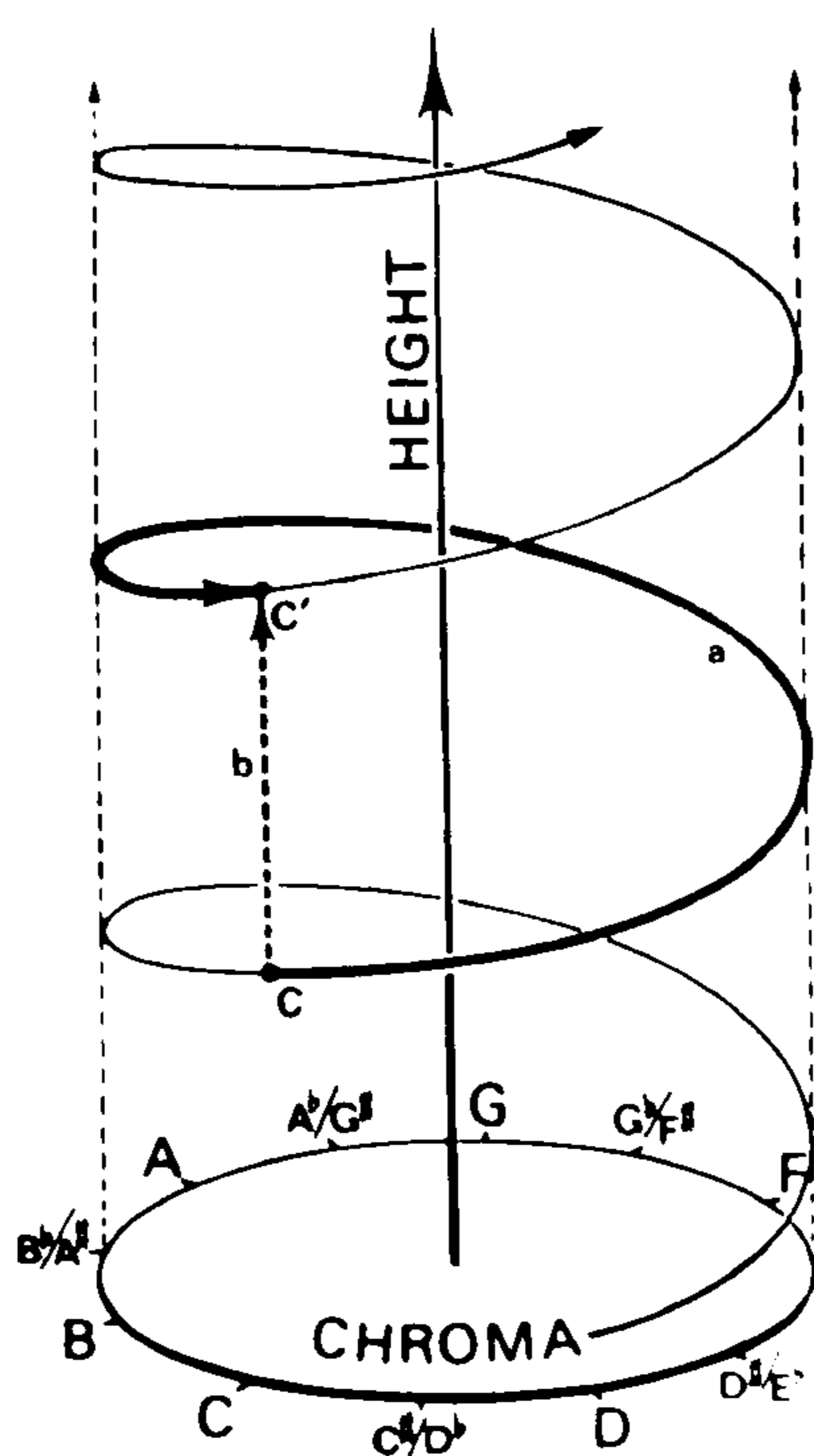
Objects in, and objections to, musical space

The spatial metaphor is a fundamental part of the way music is learned, thought and talked about in the West (Cook, 1990: 218). In the first piano lesson, pupils are taught to find *middle C*, the physical location of that key on the piano keyboard corresponding to its position as notated on the staff, as well as that of its pitch in relation to a normative piano texture. For many instruments, and for voices, such a direct association between physical and musical space does not apply, although spatial terms are commonly used

across contexts independent of the piano: *high* notes, the *bass* (base) part, *extended chords*. The first two of those examples connote ‘height’ and ‘depth’ respectively, implying that pitch is a single, vertical dimension. Theoretically, for a great deal of music it ought to be possible to give a simple answer to the question of where composers put sounds, in the form of a graph, with pitch as the vertical axis and time as the horizontal. That is indeed the fundamental tenet of conventional Western notation as, in essence, the staff and the barlines provide exactly such a grid. Thankfully, no music is quite that simple.

For instance, in geometry, a ‘chord’ is a line cutting across a circle, while here, the term denotes a combination of pitches intersecting the octave. Accordingly, due to octave equivalence (the notion that pitches an octave apart sound the same only higher or lower), pitch is perceived as a spiral continuum rather than a linear one, as shown in Shepard’s ‘helix’ model, shown below.

Ex. 1.2:



(Shepard, 1965: 105)

Besides what it says about the nature of pitch perception, this diagram is testimony in itself to the potency of spatial conceptions as regards music. It communicates the basis of Shepard's conception with great efficacy and immediacy, offering an extra dimension to understanding the matter at hand, in addition to the text of his chapter. Thus, readers are presented with a set of relationships between text, image and subject matter; a network. It is intended that the various visual representations in this thesis will offer similar clarity of expression.

Ironically, despite the extraordinary simplicity with which Ex. 1.2 illustrates its subject matter, it is included here to demonstrate the complexity of the notion of musical space. Rarely, if at all, does pitch function as a single 'high/low' axis. Thus, the metaphor is far more sophisticated than the hypothetical two-dimensional graph might suggest. Music has many attributes other than pitch, as is borne out further in the vocabulary used to talk about it. 'Textural *density*' refers to the manner in which it occupies space as opposed to its location (its level of concentration); '*surface-level* activity' refers to a particular part of the object – the outer edge – its most immediately perceptible characteristics. Other features do not conform so readily; 'tone *colour*' is a non-spatial, visual term, used to describe a particular aspect of musical sound, timbre; 'question-and-answer' phrases evoke a different analogy altogether.

So far, discussion has shown that the way people talk, learn and think about music is, to some extent, underpinned by a notion of space. This is easily understandable at an elementary level, concerning relative pitch 'height', although in other respects it is harder to draw the analogy with any consistency. Nonetheless, spatial terms are commonly used to describe certain other musical characteristics, and in other cases still, terms normally

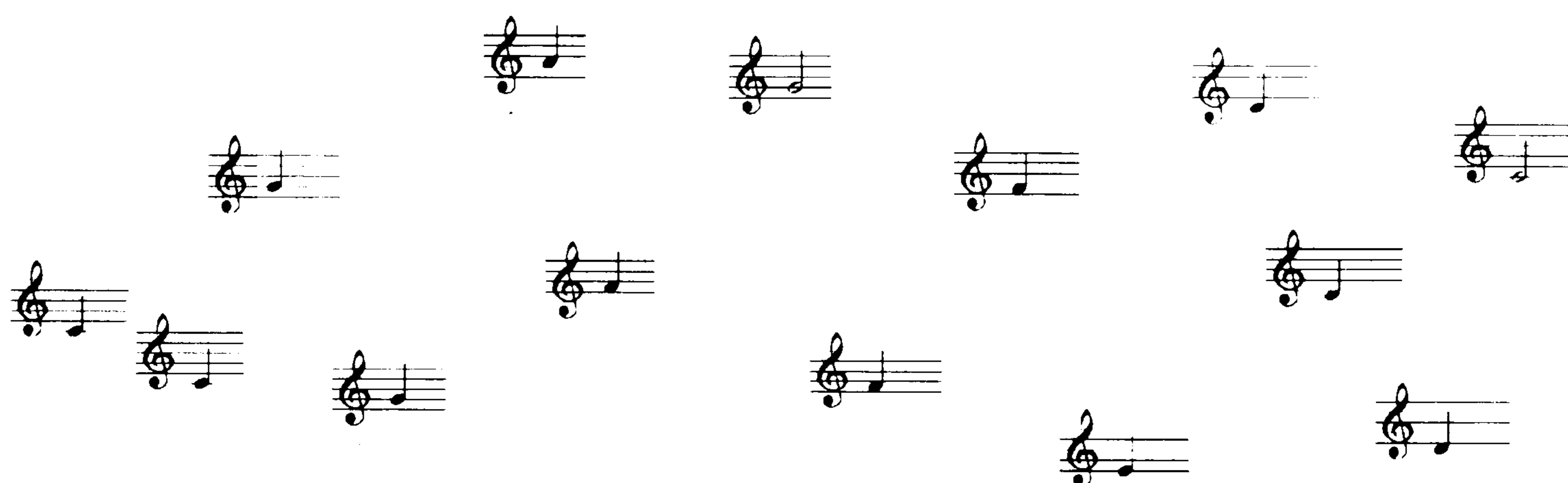
attributed to physical objects serve the purpose. This idea, of music as an object in space, only *begins* to explain how it communicates; the analogy requires careful and considered application.

For all that this metaphor offers musical thought and vocabulary, the inevitable question remains unanswered: what is musical space? Notionally, just as one might take two physical objects and place them next to each other in physical space, so one might take two musical objects and compare them in musical space. Thus, insofar as it might be defined, musical space is a basis for comparing musical sounds, and thus it might vary in nature according to the attribute under scrutiny. For example, this might be timbre, melody, harmony, form, or even style. As a composer puts sounds in musical space, such characteristics provide the grounds on which they might be recognised as similar or different, and thus, in a variety of ways, meaningfully related to one another.

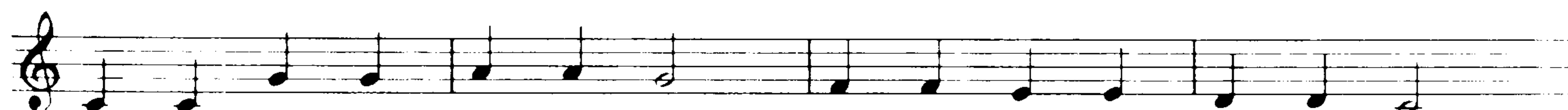
The idea that two sounds might be comparable in terms of their spatial characteristics implies that they can be taken out of time, and their relationship appreciated. However, as well as positing spatial relationships between musical sounds, in most pieces, composers also take decisions as to their relative temporal placements. Thus, the role of the composer in the communication process is to put sounds in musical space and time, such that the implied relationships might be meaningful to listeners. Indeed, listeners can only experience music as unfolding in, or at least passing through, time. A simple example is given below.

'Twinkle, twinkle, little star'

In practice, virtually nothing could be easier than listening to 'Twinkle, twinkle, little star'; its frequent use as a lullaby is testament to the lack of effort required on the part of listeners. Nonetheless, that process is underpinned by the various cognitive mechanisms by which the following stimuli –

Ex. 1.3:

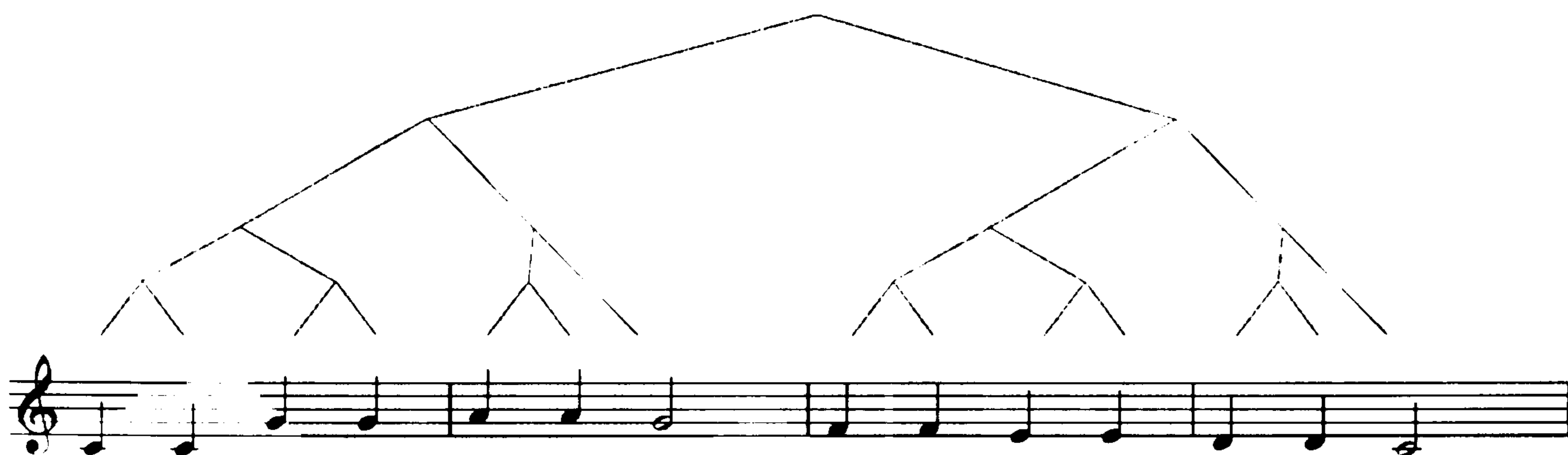
– are grouped together and perceived as a single temporal trajectory, a melody:

Ex. 1.4:

Of course, the notes are not nearly as random as Ex. 1.3 might seem to suggest. They all belong to a C-major mode, which provides a framework in musical space, in terms of which listeners can perceive relative harmonic strength and weakness. Further, the minims at the end of the second and fourth bars provide markers which divide the tune in time. Nonetheless, to hear two complementary phrases implies recognition of the importance of the order in which the notes appear, and their respective durations. Thus,

listeners identify trends in the occurrence of smaller units (notes), which constitute a bigger one (each phrase). Since these larger units are easily recognisable patterns, they themselves are characterised in relation to one another, and can be compared as the constituent parts of yet larger units. In this case, the antecedent-consequent relationship in Ex. 1.4 means that together these two phrases make up one of three pairs within the ABA structure of the nursery rhyme as a whole. Thus, by comparing and recognising trends in the occurrence of stimuli, listeners construct increasingly large stimuli-groups. More importantly, that perceptual grouping process gives rise to a hierarchical set of connections in musical time and space, presented below in a manner akin to a Chomskyan 'immediate constituent tree', as might be used to analyse a sentence:⁴

Ex. 1.5:



It is impossible to argue with absolute certainty that listeners hear the melody as shown, because no two individuals will respond identically to a given musical

⁴ In discussing music as communication, there are inevitable crossovers with language - Noam Chomsky is the second linguist to have figured in discussion. Sloboda discusses how Chomsky's ideas about analysing sentence structure might be related to ideas about musical structure (Sloboda, 1985: 11-17; 32-8). Tree diagrams have been used to explain music most comprehensively by Lerdahl and Jackendoff, who profess a Chomskyan influence. Their method is discussed in Chapter 2.

experience. However, as Sloboda suggests, there is indeed something which applies universally to listeners: ‘...it seems as if some specifically human tendency to create and notice organized patterns, hierarchies and sequences, has overrun and overhauled almost every type of behaviour ‘inherited’ from non-human primates’ (Sloboda, 1985: 266). This resonates with Meyer’s account of the Gestalt Law of Prägnanz, which states that the human mind is predisposed to recognise the best ‘fit’: the most salient form, which is constituted in this case by a single melodic contour, in compliance with the Gestalt laws of good continuation and good form (Meyer, 1956: 16-20; 83-127). The important thing here is that by grouping stimuli together, listeners make connections, and it is in those links that significance lies. In this case, the overall organisation is hierarchical, which implies a particular, directed organisation of musical time and space. There is an important distinction between the notion of a network and that of a hierarchy, discussed in Chapter 2, although at a fundamental level, it is clear that the human tendency to recognise patterns and trends in stimuli groups enables the creation, or imagination, of meaningful links between events – of networks – in time and space

Perspectives on music

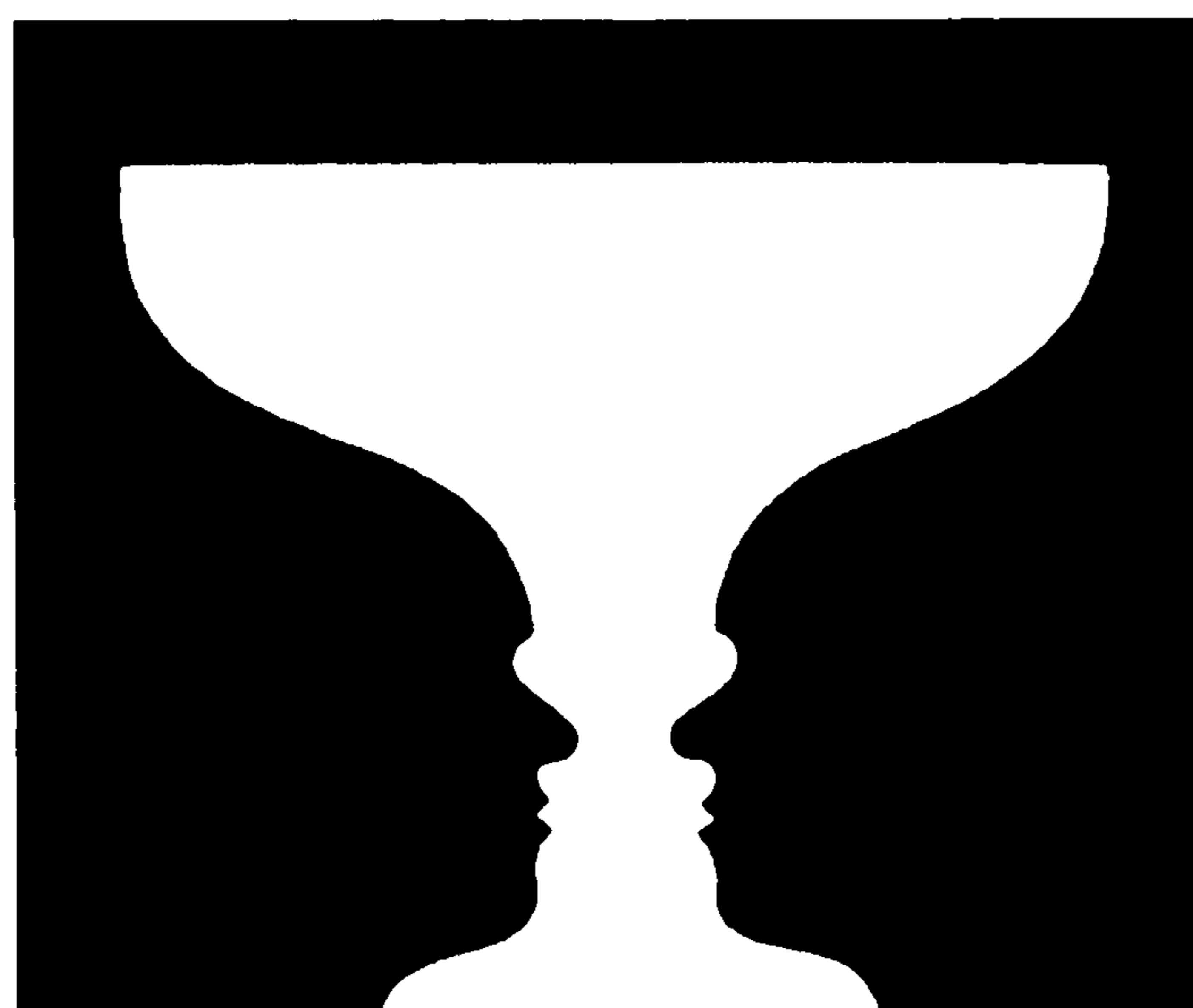
A final aspect of the Gestalt approach to ... perception was their emphasis on **figure-ground organization**. When we look at a visual scene, part of it stands out as a solid, well-defined object (the figure), whereas the rest of the scene seems less distinct and important (the ground).

(Eysenck, 1998: 140)

Regarding music, the notion of figure-ground organisation can be understood most easily as being manifest in terms of texture. It is what enables listeners to hear a

relationship between melody (figure) and accompaniment (ground), as attested by Meyer (1956: 122) and Sloboda (1985: 168-170). Sloboda says that in 1985 the ‘hypothesis [was] that polyphonic music is perceived as an ambiguous pattern capable of ‘figure-ground reversal’’ (ibid: 168). He argues that, just as visual perception of the famous Rubin's faces-vase figure (shown in Ex. 1.6) oscillates between an image of two silhouettes of people looking at each other and a central, white vase, so lines of polyphony can emerge as more or less important as listeners focus their attention on different parts of the texture.

Ex. 1.6:



This visual illusion occurs within a fixed spatial frame, defined by the outer edges of the image, although its perceptual nature changes as it is viewed in time. The illusion of depth is in constant flux. Similarly, the idea that particular polyphonic lines become prevalent at different times is dependent on the notion of the overall texture as an ongoing (albeit changeable) structure in musical space. The definitive frame for a piece of music

exists in time rather than space, however as ultimately its outer limits are defined by its beginning and end. Thus, just as 'Twinkle, twinkle' might be considered as a figure in relation to a C-major ground, so that notion of depth is manifest temporally, as the present percept stands in relation to the duration of the overall form.

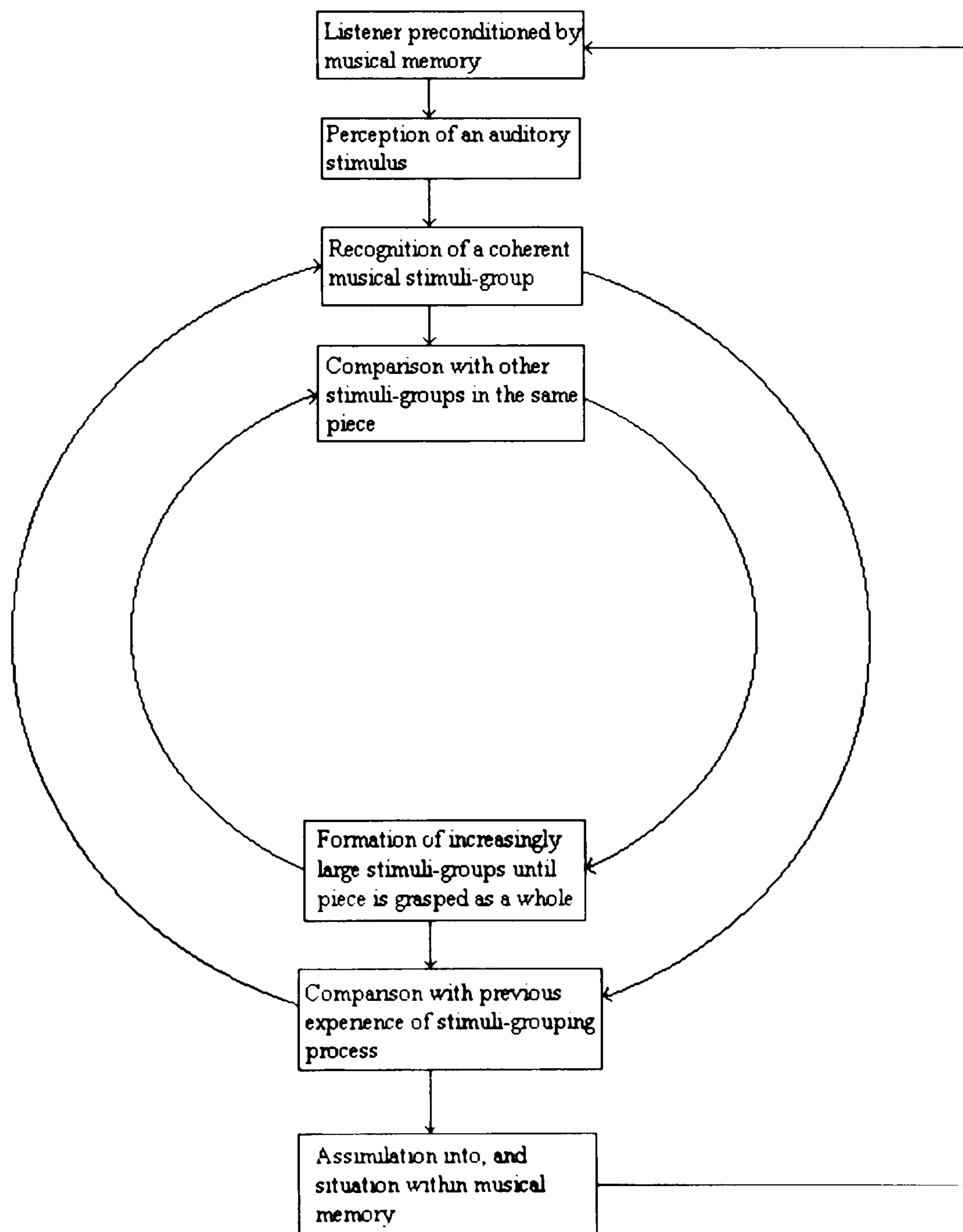
Hypothetically, temporal figure-ground organisation is dependent upon events occurring at different rates. This is reflected in the Schenkerian notion of foreground, middleground and background. Activity at all three levels is governed in relation to the same spatial framework – the tonally divided octave – meaning that the all-important distinction between them is their relation to time. The essential difference concerns speed, as foreground *figures* move faster than the background *structures* which determine their implications for continuity – their significance. As such, in presenting processes which take place over differing time periods, music offers listeners a variety of different perspectives from which to perceive relationships between events.

Temporal perspective is the musical equivalent of being able to step back from or move towards a painting and to consider how it coheres. Effectively, for a traditional painting, the further back the viewer stands, the more things cohere and combine – the more things depicted in space co-relate – to form the whole. Similarly, the diagram in Ex. 1.5 might be thought of as illustrating the process of 'standing back' in musical listening: as the branches of the tree move further away from the melody, more and more events are assimilated into increasingly large perceptual units. Because the notes of the tune – events occurring in time – are grouped together in memory, notionally they form units in space. Effectively then, memory 'sucks the time out of events', by converting perceptual time into mnemonic space. Thus, those two dimensions are not actually different at all,

but refer to different quantities of time under consideration. A vertical 'cut' into a piece of music represents an isolated instant, and a horizontal span or passage is simply a longer 'instant'; a thicker slice.

As discussed above, to hear 'Twinkle, twinkle little star' is to perceive a sequence of notes as grouped together such that, perceived from the highest perspective shown in Ex. 1.5, they form a melody. Thus, listeners are engaged in a process of construction, whereby smaller perceptual units (the notes) are the building blocks of a mental representation of the tune as a whole, which exists in memory. This process is represented in the inner circle of the diagram below.

Ex. 1.7:



In addition to the construction of memories, another process at work in musical communication is listening as situation, represented by the outer circle of the diagram. This might be thought of as taking an even higher perspective on music than that of form, such that as well as comparing relationships between the sounds in the piece they are hearing, listeners also make comparisons with events in other pieces; they take a 'bird's eye view' of their musical memory. From that perspective, they might perceive styles, which Meyer says are 'complex systems of probability relationships in which the basic meaning of any term or series of terms depends upon its relationships with all other terms possible within the style system' (Meyer, 1956: 54). Put more simply, a style is a network of probabilities as to how the sounds in a piece might relate to one another, and thus a means for listeners to perceive the potential implications of musical events.⁵ Thus, networks of *composition* exist at a number of perspectives both within pieces and beyond their timeframes, and they can be manifest in terms of many comparable aspects of music. It is worthwhile therefore, defining what can be meant by the term.

The Composition of Networks

The starting point for this chapter was the idea that the term 'network' can be used to refer to many things, and unsurprisingly, it has been used in connection with music for some time now. Rather than catalogue the many times the word has appeared in the literature, two applications are cited here: David Lewin's 'Klumpenhauer Networks'

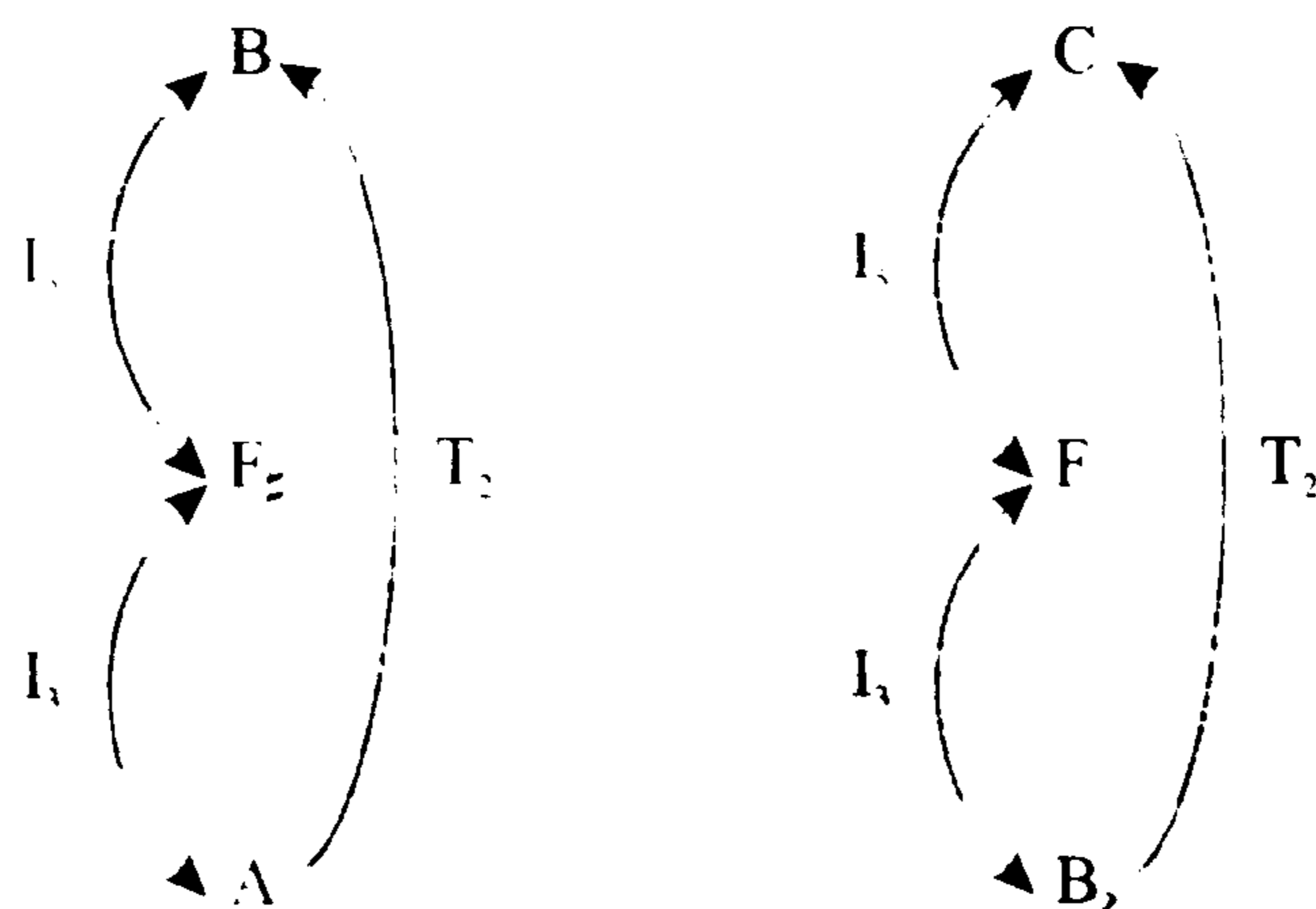
⁵ This concept is explained more fully in Chapter 6.

and computer-based neural networks. Like the two branches of semiotics, these two kinds of network are highly contrasted, the former one involving score-based work (with the implicit assumption that musical communication happens on the page), the latter being concerned with modelling the minds of listeners.

Klumpenhouwer Networks

In his article, 'Klumpenhouwer Networks and Some Isographies that Involve Them' (Lewin, 1990), David Lewin develops a means of interpreting the intervallic patterns inherent to atonal pitch aggregates. The kernel idea from which Lewin's theory springs was had by one of his doctoral supervisees at the time of the article, Henry Klumpenhouwer, and the term 'network' refers to the diagrammatic presentation of the particular sonorities under scrutiny. 'Klumpenhouwer's idea, both simple and profound in its implications, is to allow inversional, as well as transpositional, relations into networks...' (ibid: 84). Two examples are given below. (The chords in question come from the first and fifth bars of Schoenberg's Opus 19, No. 6 respectively.)

Ex. 1.8:



(taken from Lewin, 1990: 85).

The transpositional (T) relationships expressed in the figure above are easy to understand. There are two semitones between A and B, and between B[♯] and C, hence the arrows connecting those pitch classes are labelled T₂. The inversive (I) relationships are slightly less straightforward: using conventional Forte labels, in which the pitch classes within the octave are numbered from 0 to 11 (C = 0, C[♯]=1, D=2, and so on), the two pitch classes in question are added together, and the sum gives the I relationship (if the result is higher than 12, then 12 is subtracted, in line with set-theoretic conventional practice). So, F (5) + B[♭] (10) = 15, which, after 12 has been taken away, gives the inversive relationship I₃.

Using this method, aggregates containing different pitch classes can be seen to share common characteristics, as shown in Ex. 1.8. Further, because they allow T and I relationships to sit side-by-side, Klumpenhouwer networks enable multiple interpretations of the same chord. It is easy to see how this idea might be applied more comprehensively. By considering combinations of pitches as networks, and mapping their occurrence in the course of a piece, underlying patterns might be seen, shedding new light on the structure of atonal music. However, the basic arithmetic above barely scratches the surface of the sheer volume of calculation required in understanding this theory. Just as Nattiez' paradigmatic method seeks scientific objectivity, so Lewin's Klumpenhouwer Networks are dependent upon a huge volume of mathematical calculation. A sample of the article – one of the less abstract passages – is given below.

Ex. 1.9:

Fig. 4b.

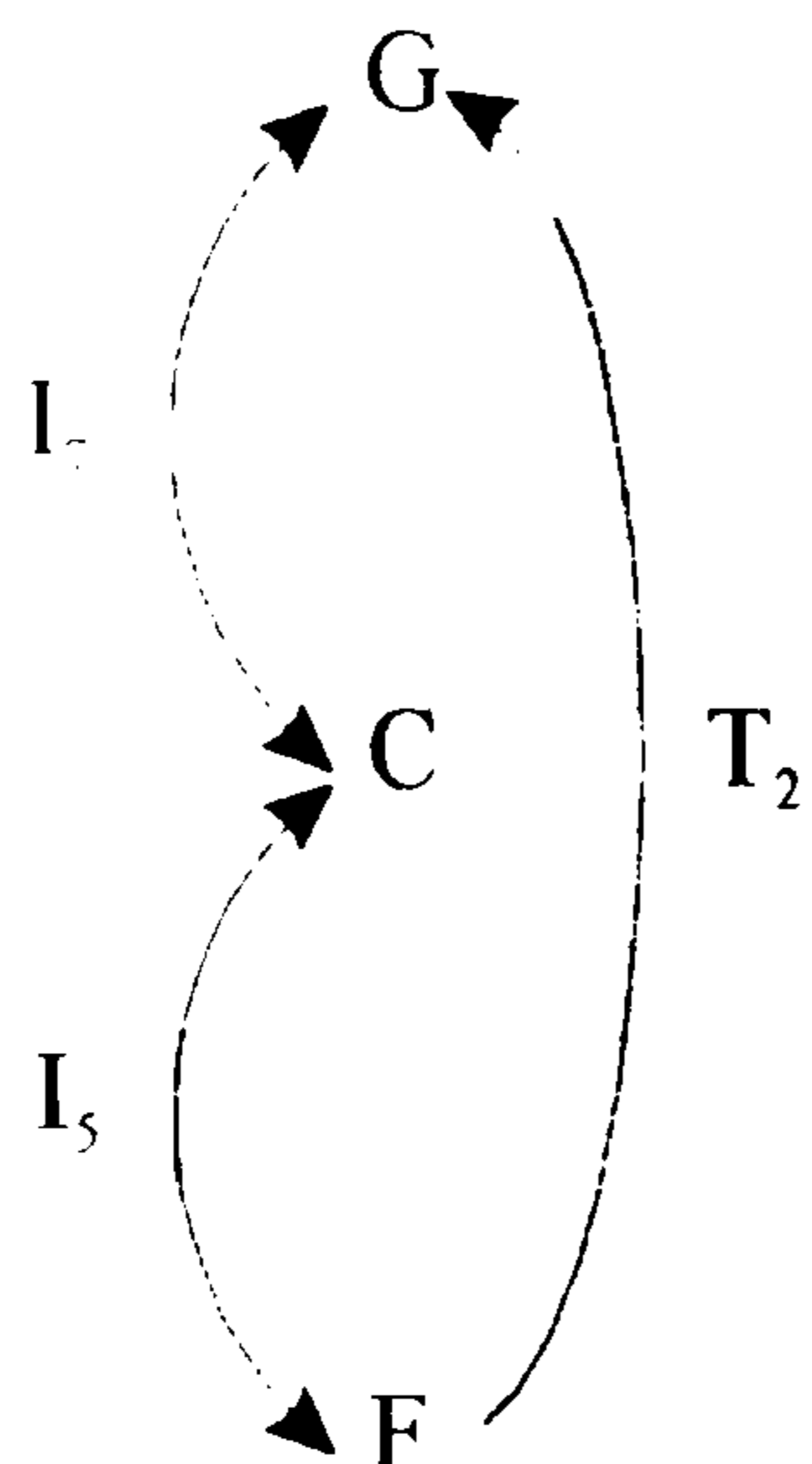
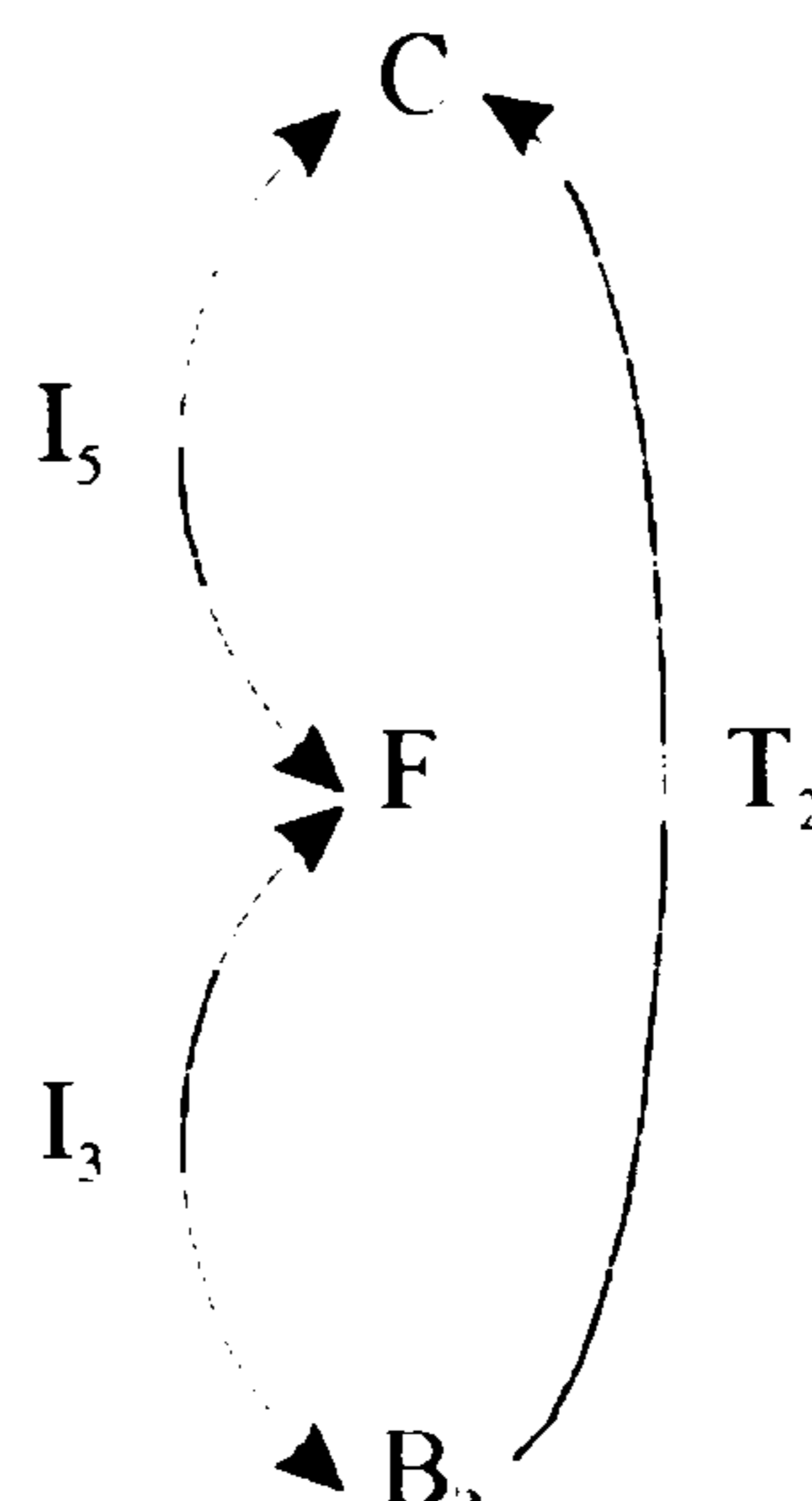


Fig. 4c



(Lewin, 1990: 85)

This is the sense: to get from 4b to 4c,

1. Transpose each pc of 4b by T_5 , as it lies.
2. Taking in turn each operation X that labels an arrow of 4b, replace it by the operation $(T_5)X(T_7)$, to label the corresponding arrow of 4c. In this way, each T_n -arrow of 4b remains a T_n -arrow of 4c, since $(T_5)(T_n)(T_7) = T_n$. And each I_n -arrow of 4b becomes an I_{n+10} -arrow of 4c, since $(T_5)(I_n)(T_7) = (T_5)(T_5)(I_n) = (T_{10})(T_5)(I_n) = (T_{10})(I_n) = I_{n+10}$.

The second step above instances a situation discussed elsewhere “in great generality: When a system modulates by an operation A , the transformation $f' = A f A$ -inverse plays the structural role in the modulated system that f played in the original system.”

(ibid: 86)

Needless to say, this ‘sense’ of music is quite different from Monelle’s, and again, it is different from the one adopted here. Lewin is, of course, setting out the mathematical grounds on which these two Klumpenhower-Networks relate, and explaining how it fits in with a larger part of music theory. However, because the expressions used are so staunchly mathematical, it is rather difficult to see how these algebraic operations and equations relate to the listening experience. Or at the very least, this approach seems to

impose a huge demand on intellectual resources for the sake of explaining (what is to all intents and purposes) the mere transposition of a trichord.

The current intention is to communicate clearly about the kinds of perceptual processes that listeners might experience in music: anything which might require the reader to stop and think as mathematically as Lewin's method does is to be avoided, since it is directly opposed to the applied nature of the research presented here. The important thing which Klumpenhouwer-Network thinking has to offer is the potential for multiple interpretations of the same pitch aggregate. This reflects the listening experience, in that different types of process can be seen to be functioning simultaneously within, and in application to, the same musical structure. However, for the sake of simplicity, clarity, and with a view to avoiding overly microscopic and abstract analysis, Klumpenhouwer Networks are not used as an analytical tool in this thesis.

Neural Networks

The term 'neural network' is used to describe a particular way of organising computer processors, based loosely on the way in which neurons are organised in the human brain⁶. In traditional von Neumann computers, a Central Processing Unit (CPU) carries out the various calculations and commands demanded of the system one after the other; 'input' data enters the system and passes through the CPU, which, having performed the required task, responds with 'output' data. Thus, the system as a whole is linear and centralised.

⁶ The basics of this area of computing are explained extremely clearly in the Introduction to *Neural Network Architectures* (Dayhoff: 1990: 1-20). That chapter was the main point of reference for what follows. The opening chapter of Clarke's *Ways of Listening* (2005: 25-9) provides a clear discussion of two hypothetical applications of neural networks to modelling musical perception.

By contrast, the structure of a neural network consists of at least three layers: an input layer, an output layer, and a number of ‘hidden layers’ in between. On each layer, there are numerous processing units which, despite being capable of carrying out only a few commands each, are highly interlinked, such that when data is put into the system, connections between particular ones on different layers might be activated. Thus, ‘each interconnection between processing units acts as a communication route’ (Dayhoff, 1990: 7), and, as Clarke puts it, the ‘knowledge’ is distributed throughout the network (Clarke, 2005: 26).

Further to this, the ‘weight’, or strength, of connections between certain processing units can be changed. Because of this, the overall effect of the system is variable, and it can be ‘trained’ to behave differently; by ‘learning’ to respond appropriately to part of the overall dataset, a neural network can develop strategies, in the form of appropriate communication routes, for dealing with data it has not seen before. This training can occur under ‘supervised learning conditions’, in which target outputs are specified by the user, or, if it is a self-organising network, in unsupervised conditions. In the latter case, the system responds to particular input patterns, classifying them into similarity categories (Dayhoff, 1990: 7).

Neural networks have a wide variety of applications: they are used to predict the onset of medical conditions; to predict fluctuations in the stock market; and to monitor the condition of machinery (Neural Networks website [n.d.]: accessed 21 December 2008). In music, they have largely been applied to modelling aspects of perception – computers have been trained to ‘hear’ various aspects of music. Griffith and Todd’s edited volume, *Musical Networks*, surveys the field, and includes chapters discussing the

use of computers to model phenomena such as the perception of tonality, and that of ‘Apparent [pitch] Motion in Music’, as well as melody recognition, and the perception of metrical structure (respectively, Griffith, 1999: 23-43; Gjerdingen, 1999: 141-173; Katz, 1999: 199-224; Large and Kohen, 1999: 65-96). PART IV of the book consists of studies in which neural networks have been used in composition, although with limited ‘success’ – in their chapter, ‘Frankensteinian Methods for Evolutionary Music Composition’, Todd and Werner ‘review recent attempts ... at ... algorithmic composition ... and indicate how monstrous many of the results have been’ (Todd and Werner, 1999: 313-339)!

This kind of musical network is one which does not bear any deeper discussion here; the purpose of this thesis is to discuss how music communicates to humans, rather than how Dayhoff’s ‘communication routes’ function in computers. However, to recognise and acknowledge the use of the term ‘network’ as applied to music, in a completely different sense, is interesting and worthwhile. By considering the conceptual similarities and differences between Neural Nets and Klumpenhouwer Networks it is possible to deduce certain general characteristics of networks and, in that connection, communication.

Like the two branches of semiotics, these two ideas are highly contrasted, one focussing on syntactic aspects of musical structure, the other having an astonishing breadth of application, both within music and beyond. This resonates with my own account of the simultaneous processes of listening as construction and situation: communication seems to invite interdependence between the perception of the intrinsic features of the signifying object and the ways it might relate to other objects. However, looking beyond their ‘inward-outward’ opposition, there is a common factor between

these two network theories: in both cases, the patterns which are called ‘networks’ are marked by their ‘distributed’ quality, which distinguishes them from their ‘linear’, ‘directed’, or ‘centralised’ equivalents. This is explained above in terms of neural networks, although this aspect can also be seen in Lewin’s theory. Notionally, interpreting a pitch aggregate using a Klumpenhouwer Network offers the analyst a number of options, as T and I relationships can be used side-by-side. In a straightforward sense, those relationships are distributed through the sonority in question. However, at a more abstract level, in a Klumpenhouwer-analysis, multiple intervallic patterns can be discerned in the same group of pitches, rather than a single reading being imposed – by implication, the coherence of the pitch classes might be said to be distributed amongst a number of possibilities, instead of conforming, in a directed sense, to a single interpretation. Thus, this thesis concerns the study of how different distributions of events enable music to function as communication

(Net)working conditions

As explained at the outset, the purpose here is to celebrate the diversity of contemporary musical culture by applying the seemingly limitless term ‘network’ to music. Inevitably, however, the need for some sort of a working definition must be addressed, in order that the subsequent chapters can be seen to subscribe to some sort of overall pattern, such that the research presented here works as a thesis. In order that it can be applied to as broad as possible a range of music, the definition needs to be flexible, and can therefore be interpreted in a number of different ways.

A network shall be a distribution of points in musical time and space, which offers listeners opportunities to perceive connections between the events in a piece and other sound events (be they in the same piece, from another piece, or taken from an extra-musical context). Further to this, it might be that a network actively prevents certain perceptual links from being made; as the opposite of connection, dis- (or non-)connection is, potentially, equally as meaningful. A 'point', as defined here, might be constituted in a number of ways: as a timbre; a tonal centre; a motif; a style; or any other musical percept which can be named and compared with other points.

Logically, the following conditions must apply to any example of a network:

1. The points which make up the network must exist within the same domain; they must all be the same *kind* of thing. Thus, networks exist within a conceptual 'space' – in this case, musical space.
2. Within that space, the points represent positions, the relationships between which are potentially meaningful. Thus, each point has significance relative not only to the others present but also to the *kind* itself.
3. Condition 2 implies that each point is significant relative to at least two fields of comparison: firstly, there is the kind, and secondly, those points which are present (the network). Thus, a network is a *context* for meaning, rather than a single relationship.
4. In view of condition 3, a number of relationships must be perceivable.
5. Importantly, networks exist in time as well as space. As different points might be connected at different times, the effect that a network brings about can vary.

Further, as more points are connected, networks evolve, starting from a single point and gradually growing to include more.

The purpose of the above is not to serve as a 'check-list' against which the music under scrutiny can and must be seen to conform, from condition 1 through to 5. Rather, the intention is to try and arrive at certain principles which implicitly underpin the discussions in the remainder of the thesis. As explained above, each individual chapter takes two things for granted: firstly, that music communicates, and secondly, that communication occurs in and through networks.

Twentieth-century music: a case for case studies

The fundamental premise for this thesis originates in the thinking of Meyer: as explained above, as listeners group stimuli together, they form networks of perceptual connections. The underlying basis for significance in Meyer's approach is dependent upon harmonic and tonal resolution, since at a fundamental level, listeners' expectations are aroused by the innate human need to experience stability, as a basis for recognising pattern completion. This places twentieth-century music in a particularly interesting position, since following the dissolution of tonality, composers began to find new ways of structuring musical space and time. Because they were based on new kinds of relationships between sounds, their works were, by implication, new manifestations of music as communication – new networks of *composition*.

Due to the many different approaches taken by composers, the music of the last 100 years is marked by plurality rather than any particular overarching aesthetic movement. The pieces discussed in this thesis span the years 1913 to 1984 and were

chosen in an attempt to reflect the rich diversity of that period, rather than to trace the development of a particular style or technique. Accordingly, no consistent analytical method is applied, nor a new one proposed or devised. Instead, with a view to considering each of the pieces as an individual basis for music as communication, research has been carried out first and foremost by listening, reflecting, and rationalising that experience. All of the chapters discuss substantial pieces from the twentieth-century repertoire. They are all influential, often iconic works, still frequently performed and recorded today; and arguably, each one presents a distinctive perspective on communication.

Accordingly, the thesis is structured around single-work case studies, rather than being organised on the basis of concepts and themes that they might have in common. Since each work presents information in its own distinct way, collectively they offer fundamentally different relationships between sounds. Thus, to try and break down these collective listening experiences to the level of common denominators, and to organise the thesis accordingly, might lead to discussion of overly abstract, and perhaps contrived, relationships between them. Instead of setting out a formalised theory of communication and trying to impose it upon the pieces, the attempt is to allow the music itself to 'do the talking': to consider the listening experience each one presents, and how it might bring about communication on its own terms. Thus, the approach is one of perpetually following through the implications of those questions and their answers. Rather than channelling ideas towards a single definitive statement, the process of conclusion is an ongoing one, occurring within and through the individual chapters. As such, the value of the thesis lies in the *process* of applying the concept of networks to music rather than its

product. Its worth is located in the manners by which, and the extent to which, synthesis is possible on account of that process, rather than any definitive 'proof' to which it might lead.

Section 2 investigates the ways in which listeners might perceive networks in Ligeti's *Atmosphères* (1961), Debussy's *Jeux* (1913), and Stravinsky's *Requiem Canticles* (1965-6). Each of these pieces presents a particular challenge to the process of listening as construction, and thus seems to subvert the notion of musical networks as bases for significance. The fluid continuity and saturated sound masses of the Ligeti make it difficult to perceive division; by contrast, the stark oppositions and discontinuity of *Requiem Canticles* seem, superficially, as though they are intended to prevent listeners from making perceptual connections between blocks; the surface of the Debussy seems so thoroughly interrelated that it is difficult to perceive one perceptual connection as any more significant than any other. Collectively they offer different perspectives on the idea of musical networks

Section 3 concerns listening as situation, and considers examples which seem to invite connections with musical events lying outside the work under scrutiny. Chapter six discusses the general concept of situation as distinct from construction in greater detail than the above, with reference to short analyses of Stravinsky's *Symphony in C*, and an example of popular music: A Tribe Called Quest's 'Can I Kick it?'. Together they demonstrate the diverse potential of the notion of networks. The more substantial case studies in chapters seven and eight represent different approaches to the manipulation of listeners' situation process. Crumb's *Black Angels* (1970) communicates using many

different kinds of reference, including quotation, pastiche and imitation: Berio's *Voci* (1984) concerns the fusion and integration of two separate styles.

The concluding chapter seeks to bring together various of the strands which run through the thesis, effectively, to discuss this research project as a network unto itself. Importantly, there is no attempt to arrive at a definition of music as communication, nor to close down the meaning of networks of *composition*. Rather, as mentioned at the start of this introductory chapter, the intention here is to open up issues, with the aim of investing music with more meaning(s) from new and diverse perspectives. Nonetheless, in the following chapter Stockhausen's *Kontakte* is juxtaposed with Mozart's *Symphony in G Minor*, with a view to defining the outer limits of the thesis, since these are radically different examples of music as communication: networks of *composition*.

Chapter 2

Archetype and Antitype:

Mozart 40 and Stockhausen's *Kontakte*

The juxtaposition of Mozart's *Symphony in G Minor*, K. 550 (1788) and Stockhausen's *Kontakte* (1958-60) seems, at first, bizarre. At surface level they could hardly be more contrasted, the latter a largely fragmentary, although sometimes gradually transforming sequence of electronic sounds (with or without piano and percussion accompaniment), the former a carefully interconnected and highly stylised formal shape performed by an orchestra. At the most fundamental level, there must be certain points of connection, however, as both are considered to be music; and given their lasting significance within the repertoire as frequently performed 'masterworks', both continue to communicate. There is also a direct titular connection. 'Symphony' literally means 'sounding together', which is strikingly similar to the notion of 'contacts' being made between sounds; both terms concern manifestations of proximity and/or simultaneity between discrete musical objects. Perhaps then, their respective forms provide frameworks in which their content might communicate those abstract notions of space and time. The very idea that they are contrasted at *surface-level* carries the implication that in both cases it is possible to penetrate beyond immediate, local events for a fuller understanding.

Both pieces were conceived in relation to formal completion, although the natures of these responses to that notion seem, at first, directly opposed. Stockhausen's well-documented moment form denies the need for global unity, implying diversity within a discontinuous series of temporal stases. In contrast, sonata form embodies a single, directed flow of time. Conceptually and perceptually, these pieces are radically different, seeming to represent extremes of music as

communication. If they are indeed opposed, and similarly if they are incomparable, it is pertinent to ask how and why, with a view to illuminating the issue of how the communication process differs from one to the other.

Defining icons, essentially (un)related

Both works enjoy an iconic status, composed at the height of their respective aesthetics, Viennese Classicism and European Modernism. This might seem merely coincidental, although it is inherent to the apex of any artistic movement that its ideas are communicated with distilled, even definitive clarity. *The Classical Style: Haydn, Mozart, Beethoven* is a detailed survey of the how the music of those composers defined the style of their era. It begins with Beethoven's departure from Bonn in 1792, after having been told '...[in Vienna] [y]ou will receive the spirit of Mozart through the hands of Haydn.' (Rosen, 1997: 19). Clearly, there was something of 'the essence' perceived in Mozart's music at that time. Over 200 years on, it is still frequently performed and written about in scholarly texts, and is in many ways representative of the Classical (with both a capital and small 'C').

That canon of Haydn, Mozart and Beethoven is also definitive of later eras. Principles embodied in their treatment of large-scale form, integrated texture, and harmonic and melodic language served as models for nineteenth-century composers. Only during the early twentieth century were new ways of addressing such concepts as global unity, temporal linearity and directionality explored by such composers as Debussy and Stravinsky. Later, the 1960s avant-garde brought yet more fundamental tenets of Classical music into question: the necessity for oppositional relationships, for example, or for temporal connectivity. Having thus stripped the art of its essence (which had originally been passed to Beethoven by Haydn) and rebuilt it,

Stockhausen's was the first European generation to produce music which overtly and self-consciously tested those very phenomena. Arguably, much of twentieth-century compositional thought stands in relation to ideals expressed so clearly by those Viennese Classicists.

It does not fall within the present remit to try to define modernism or classicism, although some contemplation of how such culturally-defining ideas are manifest in music is inevitable in considering these two pieces. The following dictionary definitions are useful:

classic:	... of acknowledged excellence; outstandingly important, remarkably typical. having historic associations
classical:	... simple and harmonious in style. ... (of music) serious, following established forms; of the period <i>c.</i> 1750-1800
modern:	... of present and recent times
modernism:	... modern views or methods

(Hawkins, 1986: 163&537)

Perhaps the most important difference between these aesthetics is the reliance on external referents for significance. According to the definitions, in classicism significance derives from conformity to an established form, style or type. This appears simple enough, although there seems to be a contradiction-in-terms here: that something might be both remarkable and typical seems to imply that it is simultaneously both the exception and the rule. In fact, classical works are remarkable for the way in which they bring about typicality by challenging norms. Importantly, they play upon the *extent* and *manner* of conformity, forming a dynamic within aesthetic experience. These ideas are investigated more fully below in relation to the Mozart. Testimony to the clarity with which his music communicates the classical ideal, it is reassuring how comprehensively they apply.

In contrast to the historic associations of classicism, the definitions pertaining to modernism are shorter and more straightforward, referring only to the here and now. In a century in which electricity drove the pace of life, there was an intensified sense of the present, giving rise to a desire for immediacy: to look outwards for identity is inevitably to make reference to the past. Compositions were built around unique systems and theories, such that each one provided its own framework for significance: events took on meanings specific to their immediate context. As with Mozart, it is remarkable how wholly Stockhausen's music seems to encapsulate this *Zeitgeist*: his Darmstadt-modernist conception of form for *Kontakte* is compressed to just one word, 'now' (see below). It follows to investigate how these ideas, the archetype and the antitype, are communicated at various levels.

Modelling Mozart: Expecting and the Unexpected

As public a genre as 'symphony' brings with it certain attachments and implications: that public has expectations. Even today, the term usually connotes a large-scale work for orchestra, although eighteenth-century audiences had far more specific expectations. In Mozart's time, 'Symphony' had implications for musical form. The 'G minor' follows the standard four-movement model: a sonata form followed by a lyrical slow movement, a minuet and trio, and a rondo finale. This seems *unremarkably* typical; the conventional number and type of movements is hardly what makes this symphony outstandingly important. Rather, it is the way in which it deviates from models at lower levels.

As explained in Chapter 1, in *Emotion and Meaning in Music*, Meyer argues that 'understanding is ... a matter of grouping stimuli into patterns and relating these

patterns to one another' (Meyer, 1956: 6). Composers played upon this perceptual truth before Mozart and well into the twentieth century (a tradition broken by Stockhausen). It was controlled particularly well by the Viennese Classicists: arguably, their works direct the grouping process with impressive clarity. Since music exists in time, composers can present the beginnings of a pattern without necessarily having to present its conclusion. As such, they can manipulate expectation. On recognising that a given pattern has commenced, listeners are furnished with an imagined idea as how it will continue and end: a model. Theoretically, if those expectations are realised, a sense of psychological satisfaction is derived, as things have turned out 'as planned', as it was imagined they would. Conversely, should the music continue in an unexpected way, listeners are left unconsciously off-course, the disparity between their imagined model and the actual musical events leaving them in a state of arousal. Inevitably, this is a simplification of a far more complex state of affairs. The basic principle is that listeners are caught in a constant flow between satisfaction and arousal; and as Meyer illuminates, this is what enables emotional affect in music. Thus, although classical music follows established forms, it is deviation from those models which gives it its dynamic force, since that is what arouses listeners. Mozart's output, the archetype, is dependent on non-conformity for its vitality.

The model principle is readily observable at lower structural levels, at which its underlying basis can clearly be seen. Notions of structural levels and (non)conformity to models are dependent on the concept of *closure*, which might be defined as the sense of satisfaction derived from pattern completion. As such, it resides in listeners; it is something that they perceive in music, rather something that is necessarily there. It is not as though the Mozart symphony is a kind of 'pattern

lottery' in which it could occur at any point, however. As a product of its creator's mind realised in those of its listeners, there are certain conditions under which closure is clearly intended to be experienced; certain groups of sounds seem complete both in their listeners' perception and their composer's conception.

In order to recognise patterns, listeners unconsciously compare proximal sounds and identify links between them, perceptually grouping them together. Inevitably, these patterns are larger (or longer-lasting) perceptual units than the individual sounds, since, by definition, they consist of more than one sound. Thus two structural levels are implied: the individual sounds are said to exist at the lower of the two, and the patterns that they form in combination, at a higher level. In turn, there might also be higher-still structural levels at which relationships between patterns can be perceived, and so on. Put in more concrete terms, notes combine to form motifs; motifs form themes; themes form sections; and sections form pieces – a generative process. Thus temporal hierarchies are established which imbue perceptual events with significance; as sounds contribute to pattern completion, they are imbued with implications either of continuation (that is, incompleteness), or of closure at other structural levels.

The first nine bars of the *Symphony in G Minor* provide a very clear example of how such hierarchical perception might be seen to operate (see Ex. 2.1).

Ex. 2.1:

(b. 1)

The image displays a musical score for the first nine bars of the *Symphony in G Minor*. The score is written on two staves: a treble clef staff on top and a bass clef staff on the bottom. The key signature is G minor (two flats) and the time signature is 3/2. Above the treble staff, a series of nested triangles illustrates the hierarchical structure of the music. The largest triangle encompasses the entire nine-bar phrase. Inside it, two smaller triangles represent the first and second motifs. Each of these motifs is further divided into two smaller triangles, representing sub-motifs. The musical notation below shows the notes and rests for each bar, with arrows indicating the flow of the melody and the harmonic progression in the bass line.

The triangles in the diagram represent perceptual units, such that the events under each one might be grouped together and perceived as a complete pattern. Accordingly, three structural levels are shown. At the lowest, the melody is divided into four two-bar phrases, although it could also be considered as a pair of four-bar questions and answers, as sequential repetition generates a middle level. In accordance with the fulfilment of symmetry in the underlying harmony, the whole melody can be perceived as a single, eight-bar unit. Overall, therefore, the effect of this temporal hierarchy is to bring about regular expectations of pattern completion, and subsequent recognition of whether or not it has occurred. Since all of those expectations are confirmed, the passage as a whole is self-contained, as closure frames the highest level of expectation up to that point.

The intention here is merely to illustrate the hierarchical nature of how listeners might perceive this specific passage – a task which, due to the formal clarity of Mozart's compositional language, this analysis performs perfectly adequately. Needless to say, however, it is a slightly simplistic reading of a simple melody which has an in-built basis for completion as a succession of pitches (the scalar descent in bars 3-4 and 7-8 seems literally to *close* the melodic gap opened by the leaps of a sixth in bars 3 and 7) and which is readily divided into temporal groups (by crotchet rests at the lowest, two-bar level, by sequential repetition at the four-bar level, and by harmonic resolution overall). It is important to recognise that there are certain percepts that the diagram ignores. In particular, it does not represent rhythmic stresses: it does not show that the first 'strong' downbeat actually occurs in bar 3, for example, which perhaps suggests that the triangles ought to be positioned differently. (Indeed, by overlooking the first bar, it could be read as suggesting that this nine-bar passage actually forms an eight-bar whole.)

An infinitely more detailed, particularly convincing, and formalised analytical method to deal with hierarchical perception was expounded by Lerdahl and Jackendoff in their book, *A Generative Theory of Tonal Music* (1983)¹. Their theory was informed by the linguistic analyses of Noam Chomsky (they cite Chomsky, 1965, 1968, 1975; Lerdahl and Jackendoff, 1983: 5), in which ‘tree’ diagrams are used to explain the relationship between the surface structure of a sentence and its deep structure. Another important influence on GTTM was the thinking of Cooper and Meyer, whose theory of *The Rhythmic Structure of Music* (1960) is grounded in patterns of strong and weak ‘feet’, such as might be found in prosodic analysis of a linguistic art form: poetry. Jackendoff is a linguist himself, although he and his co-author go to some lengths to explain that their ‘ultimate goal [was] an understanding of musical cognition’ (ibid: 6), and with this in mind, they sought to discuss music on its own (sound) terms rather than as a direct analogue for language (ibid: 5-6). For practical reasons, they restricted themselves to examining ‘those components of musical intuition which are hierarchical in nature’ (ibid: 8), and then set about deducing a generative grammar for tonal music.

This is not the place for a full exposition of the theory (such as is, of course, provided in GTTM), nor is an encyclopædic knowledge of it necessary to understand the insights it offers – the remarkably clear and self-explanatory manner in which its results are presented is testament to its success. Broadly speaking, Lerdahl and Jackendoff set out rules which suggest the conditions under which listeners might group sounds to form meaningful patterns. The *Symphony in G Minor* is used as an exemplar throughout, including a full analysis of the first 22 bars (shown in Ex. 2.2, overleaf), which is used as a comprehensive illustration of how the theory might be

¹ Henceforth ‘GTTM’.

applied. What follows is a brief discussion of that analysis, of the underlying analytical technique, and of the nature and extent of its relevance here.

Fundamentally, the outcome of Lerdahl and Jackendoff's analysis is dependent upon how they partition the musical surface according to 'Well-Formedness' and 'Preference' rules, which, respectively, spell out conditions under which listeners are *able* and *likely* to perceive events as conjoined. These are analytical guidelines as to the implications of what the authors call the Grouping, Metrical, Time-Span Reductional and Prolongational characteristics of the musical surface, and each of those four domains has its own set of both kinds of rules.

The first analytical step is to divide the melody into groups, which are notated using the 'phrase markings' beneath the reduction of the score in Ex. 2.2 (see below). Broadly speaking, the rules which govern this process of segmentation concern contiguity; they set out the circumstances in which particular events within the ongoing melody might constitute 'boundaries' between groups, and thus they dictate the formation of the Grouping structure. Following on from this, the second stage is to apply the Metrical Well-Formedness and Preference rules. In setting out their theory, the authors explain that,

Fundamental to the idea of meter is the notion of periodic alternation of strong and weak beats ...[and]...[t]he relationship of "strong beat" to meter is simply that, if a beat is felt to be strong at a particular level, it is also a beat at the next larger level.

(Lerdahl and Jackendoff, 1983: 19)

The rules, of course, specify the conditions for what can constitute a strong beat. Since they apply at a number of levels, a 'metrical hierarchy' is derived, represented by the rows of dots immediately beneath the reduction of the score (see Ex. 2.2).

Ex. 2.2:

The image displays a musical score for Ex. 2.2, consisting of a piano part and a corresponding tree diagram. The piano part is written on a grand staff (treble and bass clefs) with a key signature of one flat and a 4/4 time signature. The notes are grouped into measures, and there are various markings such as 'f' (forte) and 'p' (piano). The tree diagram is a large, branching structure that starts from a single point at the top and branches out downwards, with lines connecting to specific notes in the piano part. The tree diagram is a complex, branching structure that starts from a single point at the top and branches out downwards, with lines connecting to specific notes in the piano part. The piano part includes a treble clef staff with a key signature of one flat and a 4/4 time signature. The notes are grouped into measures, and there are various markings such as 'f' (forte) and 'p' (piano). The tree diagram is a complex, branching structure that starts from a single point at the top and branches out downwards, with lines connecting to specific notes in the piano part.

(Lerdahl and Jackendoff, 1983: 259)

The Metrical and Grouping structures are combined to create the Time-Span Reduction, shown in the tree diagram and the complementary 'secondary notation' – the harmonic reduction. At each level, the aforementioned strong-weak pairs form units which are grouped together at the next higher level, notated both as convergences between the branches of the tree (on levels *b-f*), and as events in the secondary notation (levels *b-g* are shown). Ultimately, every event is both subsumed by the top level of the tree and reduced to a single harmonic sonority, a G minor chord; and by

implication, those notations represent an event at level *a*. (The final stage of the method is the application of the Prolongational Well-Formedness and Preference rules, which explain patterns of voice-leading. Presently, however, this is not a concern, as the focus is on grouping.)

As the reader will no doubt have surmised, Ex. 2.2 does not conform to a neat-and-tidy order. On account of discrepancies between the Grouping and Metrical hierarchy, certain events do not readily fit within a simple, alternation of strong and weak beats, and in turn this influences the Time-Span Reduction. Note, for example, the seemingly redundant ‘unconnected’ branch stemming from bar 1, and the lack of a level-*e* connection in bars 10-11. The way round this, proposed in GTTM, is to incorporate those ‘problem groups’ by drawing connections at intermediate structural levels (*d*’ and *e*’). Leaving aside the issue of the first bar, this implies that the phrase starting in bar 9 belongs to a different branch of the tree than the subsequent, initially identical phrase (starting in bar 11). Such a grouping seems contradictory, following the opening melody, whose self-containment and satisfactory closure arises on account of repetition and symmetry (as shown in Ex. 2.1, and borne out here by the readily-tessellate convergences of levels *e*, *f* and *g* in bars 2-9). Indeed, Lerdahl and Jackendoff themselves remark that this ‘grouping analysis is complicated’, conceding that on account of these discrepancies, ‘the assignment of levels in the time-span reduction becomes somewhat arbitrary’, and ‘the secondary notation... becomes cumbersome’ (ibid: 258).

Despite these problems, Ex. 2.2 is a perfectly plausible representation of how a listener might choose to hear the opening of the *Symphony in G Minor*. Of course, that ‘choice’ is not (necessarily) a conscious decision: it is highly improbable that people would sit and ask themselves ‘how do I want to hear this music?’. Rather, here, the

term refers to the unconscious selective process by which some sounds, and not others, are perceptually grouped in certain ways. Analysis, however, is a wholly conscious act, and Lerdahl and Jackendoff are quite open about having made decisions which – without compromising their rule system – they might have taken differently (ibid 251, 258); indeed, the vast majority of the time spent using their method involves the application of *preference* rules.

On this issue of choice, however, the present understanding of the *Symphony in G Minor* departs from that proposed in GTTM. In restricting themselves to discussing ‘those components of musical intuition which are hierarchical in nature’ (ibid: 8), Lerdahl and Jackendoff take a positivistic view of listener perception – that mental representations of tonal musical structures are always hierarchical. This might seem to preclude the idea that tonal music can be conceived (and perceived) as networks. ‘Hierarchy’ could be considered a subset of ‘network’; effectively, a tree diagram is a set of connected points. Nonetheless, there is an important conceptual distinction between these two notions, which must be addressed.

Directed distribution: Hierarchies versus Networks

Traditional hierarchical understandings of tonal music assume that it has a ‘directed’ quality; that the entire musical surface is subsumed by a single, unified group – the *Symphony*, or movement, as a whole – which serves to articulate tonal order over time, culminating in resolution to the tonic. Thus, all of the events are motivated towards attainment of that goal. The intention here is not to present a radically different conception of how tonal music might be perceived. However, this implied directedness seems at odds with the ‘distributed’ quality of networks, which, conceptually speaking, allows for plurality of directionality – the possibility of multiple temporal

implications. Presently, an alternative reading of the type of hierarchical analysis developed by Lerdahl and Jackendoff is proposed.

If music is to be thought of as communication, the means by which it brings about significance needs to be considered. GTTM is underpinned by the idea that groups of (tonal-)musical sounds derive relative meaning as mutually implicative strong-weak (or weak-strong) pairs, thus generating hierarchical structures. By applying this principle at all levels, potentially, single tree diagrams might be drawn up to illustrate grouping strategies for entire symphonic movements. Inevitably, however, such graphs would be compromised as illustrations of perceived musical structure, for two intertwined reasons.

Firstly, (although their virtues are extolled in this thesis), at a fundamental level, all graphic representations of music are unfaithful to the listening experience, as they present a temporal succession of events simultaneously – whereas Lerdahl and Jackendoff present readers with trees, Mozart presents his listeners with the processes by which they grow. Secondly, following on from that, the possibility of multiple groupings within the same hierarchy implies that, at particular points, there are various directions in which the tree might grow. Thus, since listeners are presented with the growth of branches, plurality of implication is fundamental to listening to music as communication; in spite of the authors' acknowledgment that this passage might be grouped in a number of different ways, the value of their analysis is automatically lessened by the necessity to produce a single graphic representation. In doing so, they ignore a crucial part of the listening experience: structural flexibility.

The following discussion is an attempt to respond analytically to the flexibility of this musical structure, picking up where the simple triangles of Ex. 2.1 left off. The defining characteristic of that earlier diagram is four-square symmetry. The opening

melody clearly subdivides every two and four bars and is unified harmonically as an eight-bar whole. Thus, direct 'contacts' are made between structural levels, as moments of pattern completion are aligned; listeners have reason to expect closure at one or more levels every two bars, as events occupy pre-ordained ('every-other-bar') temporal positions within a perceptual framework. This regulation of expectation arises because of melodic repetition and harmonic resolution, which recur towards the end of the opening passage as a whole. Indeed, bars 16-20 are entirely constituted by microcosmic realisations of those two phenomena: recurrent voice-leading within a single, repeated cadence (see Ex. 2.3).

Ex. 2.3:

The diagram illustrates the structural analysis of the opening passage. It features a hierarchy of triangles representing different temporal levels: 8 bars, 4 bars, and 2 bars. A line labeled 'Temporal Compression' spans from the beginning to the end of the passage. A 'Problem Zone' is indicated by a dashed line with question marks between bars 10 and 16. The musical score below shows the notation for bars 1-20, with bar numbers 1 through 20 marked above the staff.

Taking a perspective on the passage as a whole, a sense of urgency arises on account of temporal compression: as shown, the 8:4:2-bar hierarchy of the opening melody is replaced by (the commencement of) a 4:2:(1)-bar structure at bar 10, which eventually leads to patterns of 2:1:($\frac{1}{2}$) bars (bar 16), and, by implication, 1: $\frac{1}{2}$:($\frac{1}{4}$) in bar 19. Obviously, this 'loose' analysis is not nearly as tightly defined as that in GTTM. Nonetheless, it is clear that temporal compression is fundamental to the listening experience in this passage. Thus, all of the events leading to bar 20 can be considered to contribute to a process of 'structural acceleration' in a manner quite independent of

Lerdahl and Jackendoff's method (albeit related; effectively, pattern completion passes downwards through the metrical hierarchy). Melodic recurrence and harmonic resolution increase at a consistent rate almost throughout.

In GTTM, the repeating cadences of bars 16-19 are reduced to a single, static D-major chord, such that the alternating diminished chords are mere elaborations of that (relatively) background sonority. This is entirely appropriate, given that the method is dependent on the separating out of structural levels. However, to some extent, this ignores, or does not sufficiently emphasise, an important part of the listening experience. Since listeners are presented with the growth of branches rather than simply a tree to observe, their perceptual experience is inherently dynamic. Although the diminished chords of bars 16-19 do serve to elaborate D major, the important thing here is that surface elaboration and background stability are far more closely related than at the opening ($1:\frac{1}{2}:(\frac{1}{4})$ is 'tighter' than $8:4:2$). In this case, that interaction is manifest as acceleration as hierarchical structures are successively compressed. Effectively, the way in which lower-level groupings contribute to higher-level activity is continually recast. Thus, listeners are invited to appreciate an ongoing process of negotiation between levels.

There is, of course, an interruption to this otherwise consistent process. The two-bar melodic recurrence and harmonic resolutions of bars 10-13 suggest to listeners that a four-square hierarchy will be complete at the start of bar 14. However, on that downbeat, closure is not attained: melodically, the expectation of (and implied need for) recurrence is not satisfied; the harmonic progression initiates a modulation to the dominant, D major, rather than leading back to the tonic; and texturally, the previously sustained 'tune/quaver-accompaniment/bass line' order is replaced with three-part counterpoint (the woodwind play a counter-melody to the violins, which is mirrored

by the violas). Thus, the melodic, harmonic and textural hierarchies are 'open' at a projected point of closure, implying continuation rather than arrival. Lerdahl and Jackendoff's method is sufficiently adaptable to contain this irregularity, using intermediate levels to suggest an appropriate grouping strategy. However, that very objective seems to negate the nature of significance here.

At the start of the movement, patterns of implication are established as being reliant upon – indeed, constituted by – the interdependence of adjoining levels within unified, four-square-symmetrical hierarchies. Therefore, at bar 14, presented with events that do not contribute directly to activity at the next higher level, listeners can no longer take the implications of strong-weak pairs for granted. Although GTTM suggests a sophisticated way of fitting these events within the overall 22-bar hierarchy, what really counts about them is that they do *not* fit, rather than *how* they could. Since there are multiple potential groupings, there is an experiential dynamic between ambiguity and fixity of implication, rather than the static inevitability of strong-weak alternation. Thus, the basis for significance itself is changed in bars 14-16. Where Lerdahl and Jackendoff seek to explain the significance of the problem zone, Mozart presents listeners with the problem of the significance zone. That this happens so early on in the listening experience brings the nature of implication itself into question, as well as merely the grouping of bars 14-16, and inevitably, this affects the perception of the remainder of the movement.

Whereas a Lerdahl-and-Jackendoff reading emphasises the eventual containment of all strong-weak pairings by higher levels (ultimately, by the whole movement), arguably, non-containment is fundamental to the changing nature of significance in the *Symphony*. Differences in the growth of structural patterns bring about a tension between 'bottom-upness' and 'top-downness', and that is what holds

the hierarchy together, whilst also allowing for structural flexibility. Thus, rather than a top-down, directed perception of hierarchy in which subsumption is the unidirectional, generative force, what makes this music meaningful is the ongoing process of negotiation between levels – a distributed network of closure. Although classical music follows established forms, it is the ways in which it deviates from those models which gives it its dynamic force and meaning (since that is what arouses listeners and forces them to reinterpret their expectations). Mozart's music, the archetype, is dependent on non-conformity for its vitality.

Darmstadt-modern = Anti-model?: Stockhausen and Unexpected the Expected

Despite having been composed fifty years ago, *Kontakte* (1958-60) is still an icon of 'new music', and at its première, this was literally true. In all probability, a great many of the electronic sounds in this half-hour span had never been heard before. This intensifies its modernity, as listeners had no context in which to situate the work, other than the immediate one: *Kontakte* itself. This lies at the heart of the difference between Mozart's classicism and Stockhausen's Darmstadt-modernism. In the classical *Symphony*, listeners unconsciously compare the sounds they hear with imagined models, such that the significance of past events stands in relation to that of future ones. By contrast, Stockhausen's aesthetic demands a lack of reference to anything other than the immediate present. Whereas the eighteenth-century composer demonstrably acted upon the expectations of his audience, the modernist took steps beyond acting against them, even denying them a role in the listening process; were such a thing possible, his listeners must *unexpected*. This was to be an original work in the absolute sense, in that the origins of listeners' understanding of it lie in their

perceptions of the sounds before them at each moment. By implication, therefore, the present is constantly disconnected from the past – or at least, not necessarily connected. This temporal dislocation is inherent both to the listening process and the formal conception of *Kontakte* and is emblematic of the all-encompassing clarity with which Stockhausen communicates, indeed embodies the modernist aesthetic.

Kontakte exists in two versions, one for electronic sounds diffused through four channels placed in the corners of the room, the other with the addition of piano and percussion; in both the part for electronics is identical. In the Mozart, the orchestral texture is organised hierarchically as explained above, although here materials are distributed between forces rather differently.

A series of **contact-forms** mediates between electronic music ... and instrumental music ... Six categories of instrumental sounds are employed: metal sound - metal noise, skin sound - skin noise, wood sound - wood noise; the piano either connects up or splits up these categories, or it gives signals in the ensemble playing.

The electronic sound categories create relationships and transitions between the instrumental categories ...

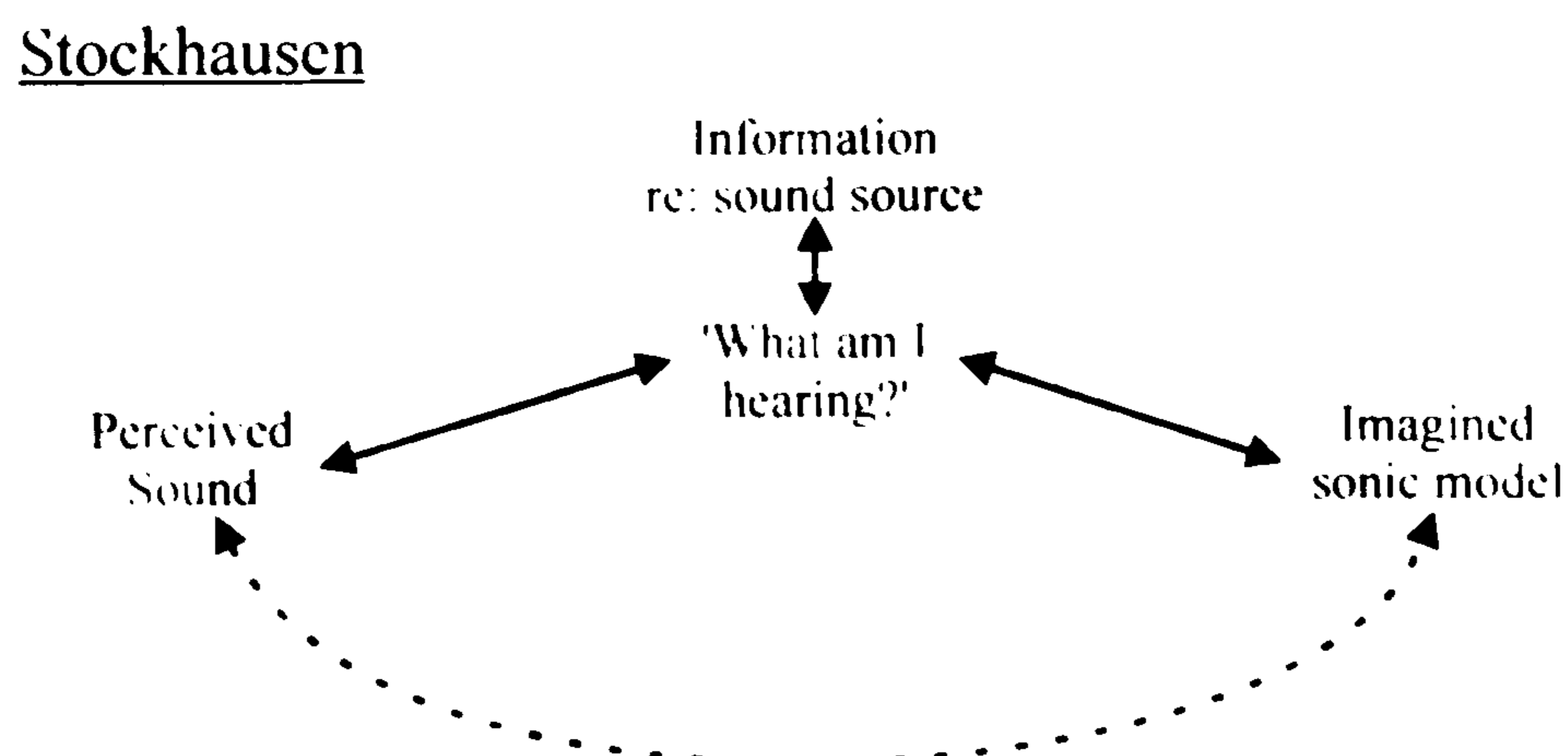
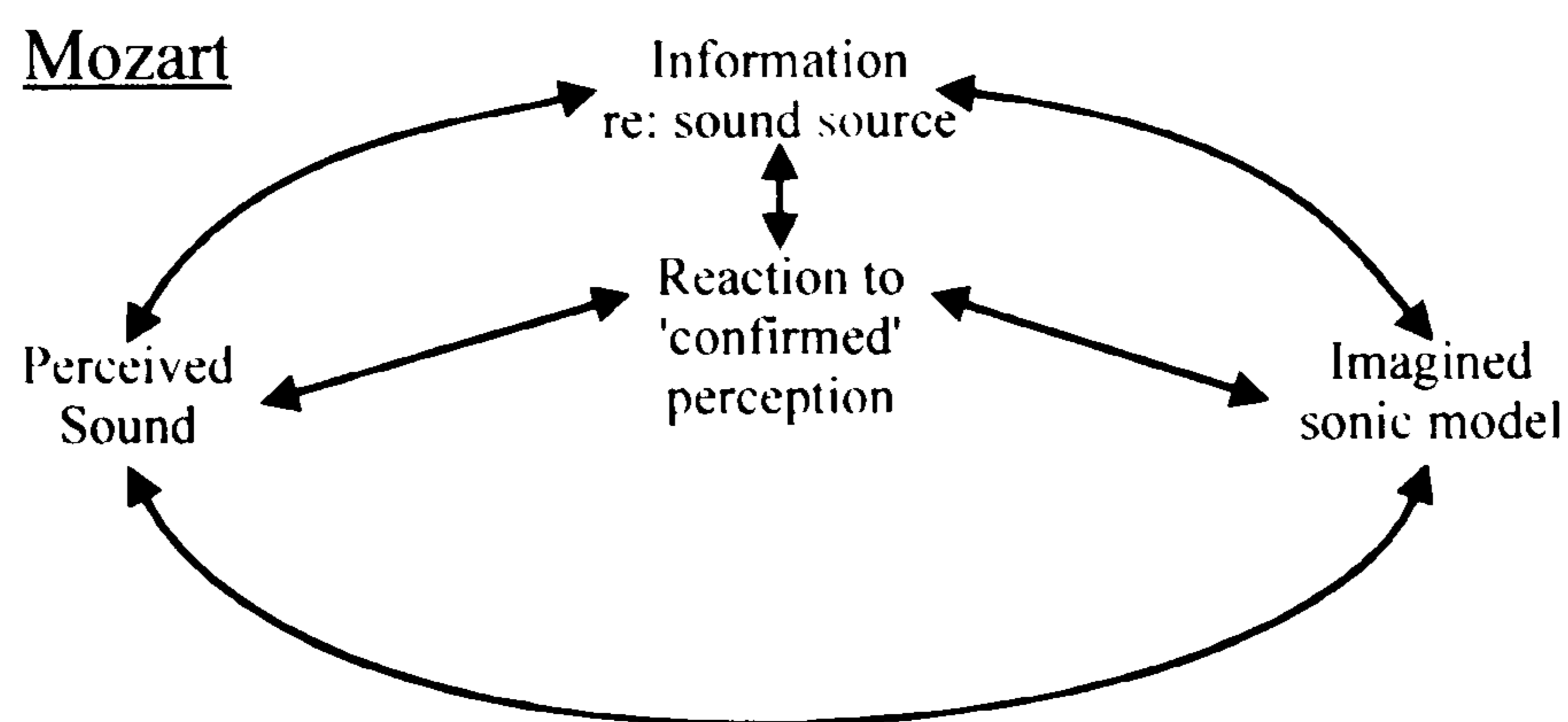
(Stockhausen, 1993: 155
(bold typeface in original))

From a single glance at the realisation score and within seconds of hearing any part of the work, it is obvious that there is no tune-accompaniment relationship. This quotation goes some way to explaining why such a hierarchy is impossible. It implies that the roles played by the instruments and electronics are in constant flux, meaning that any notion of foreground and background cannot be sustained. Instead relationships between sounds are in a perpetual state of reorganisation and creation, such that by implication, the musical information here is precisely that: music *in formation*. This results in an entirely different and lower-level listening process. Instead of unconsciously assessing the significance of musical events (questions of *why* and *how* they relate), as in the Mozart, in *Kontakte* it is not always clear *what* listeners are hearing. Indeed, this is inherent in the realisation of the work. Typically,

the work is realised with instruments, although without them, notably, an entire layer of theatrical meaning is absent. This has massive consequences for the listening experience, ensuring the immediacy of communication inherent to modernism, as listeners can only engage with the sounds and noises before them.

Faced with an orchestra, listeners are given crucial visual information as to the sounds which might occur even before a note is played – those which are possible using the instruments on stage. Furthermore, during the performance, players' physical positions and movements offer a guide to the dynamic significance of the music; as Davidson concludes, 'performers make a series of gestures which serve to clarify and coordinate certain ideas for communication to co-performers and the audience, ... which are embedded within a cultural framework.' (Davidson, 2005: 233). Faced solely with (in this case surrounded by) electronic speakers, however, no such guide to perception is available. Sonically, anything could happen in such an acousmatic context. Ex. 2.4 shows two diagrams illustrating how that interaction might work in each case:

Ex. 2.4:



In both scenarios there is interplay between three discrete factors; the sound source, the perceived sound, and the imagined sonic model to which it subscribes. In the orchestral example all three work in tandem, as the presence of the ensemble provides a framework in which information can be situated, a perceptual model. There is thus a strong 'source-bond', an intrinsic-extrinsic thread between the resulting sound and its production (Smalley, 1997: 110). Since that aspect of the music is not in any doubt, the listener is free to concentrate on the significance of the events within it: structural connections, emotional reactions, and so on. By contrast, in the second example, there is only interplay between the perceived sound and its imagined model. Listeners can but speculate as to how it is produced and must focus their attention solely on patterns in its behaviour (how it changes through time) in order to engage with it.

This does not imply that source-bonding does not occur in acousmatic contexts. It might be that the loudspeakers reproduce a performance by an orchestra, for example, in which case there would be a strong intrinsic-extrinsic thread. Innately, listeners attempt to impose a subconscious model upon the sounds they perceive. Stockhausen plays upon precisely this tendency. At various times in *Kontakte*, the electronics mediate between skin, metal and wood sounds and noises implying different extents of contact between the sound source, the imagined sonic model and the perceived sound. For example, in the passage shown in Ex. 2.5, the electronics produce a timbre similar to a bongo, with which the instruments (in the version for piano and percussion) are synchronised in a clear dialogue.

Ex. 2.5:

Handwritten musical score for Ex. 2.5, featuring a complex rhythmic structure with various time signatures and dynamic markings. The score is divided into several measures, with time signatures including 21,5", 27,1", 35,6", 38,2", 39,3", and 43,8". Dynamic markings include *mf*, *f*, *ff*, *p*, and *mf*. The score includes a section for two Bongos, with instructions: "Bis 13. entweder auf 2 Bongos mit Händen möglichst viele Tonhöhen- und Klangfarbenunterschiede spielen; Gruppen unter unbedingt synchron mit elektr. Klängen sein." and "oder Bongo+3 Tomtoms frei verwenden (obere Linie für die beiden höheren, untere Linie für die beiden tieferen)". The score also includes a section for a Bongo and 3 Tomtoms, with instructions: "frei verwenden (obere Linie für die beiden höheren, untere Linie für die beiden tieferen)". The score is marked with "synchron" and "♩ = 60".

There might seem to be an incompatibility in discussion. Acousmaticism in *Kontakte* seems worlds apart from the implications of phrase structure in Mozart, although there is a link between these two phenomena. Just as in the recognition of tonal structural hierarchy, source-bonding implies a connection between models in the listeners' imaginations and the sounds they perceive. Therefore, albeit manifest in contrasted ways, the same fundamental process occurs, only at vastly different structural levels; for the Mozart, those of melody, harmony and form; for the Stockhausen, that of timbre. Inevitably, that vast disparity of structural level has implications for communication.

In the *Symphony* the predominant model was a stylistic norm, the four-bar phrase, resulting in expectations of future events; anticipation of closure. The time it takes to experience harmonic resolution is on a different scale to that required for the

perception of timbre, however, which is, to all intents and purposes, instantaneous. It is difficult to conceive how closure might be achieved using timbre, as unlike in tonality, there are no relative states of strength and weakness to necessitate resolution. Certainly there are oppositions between bright and dark, dense and sparse, and so on, although they do not typically have a culturally-engrained temporal function. At this micro-structural level, there is a distinction between static events – separate timbres – which articulate space, and transformations, occurring over time. Pattern completion at this micro-structural level results in recognition and differentiation rather than expectation, since ultimately any given timbre is a complete sonic pattern unto itself.

It should be emphasised that this kind of ‘modelling’ does not occur throughout *Kontakte*. To try to hear the work as a full half-hour of electronics imitating instruments or vice-versa is not only impossible but is to misunderstand the modernist aesthetic of originality. Instead, one of the things that the work invites is recognition of the extent to which sounds conform to such models, throughout. Sometimes that relationship is close, as in Ex. 2.5, although most of the sounds cannot be so easily categorised. For the most part, listeners must perceive timbral characteristics and behaviour independent of mnemonic models. On that basis it may seem invalid to cite the perception of timbre in the Stockhausen as comparable to the process of hearing four-bar phrase completion in Mozart. The idea that the difference between those perceptual aspects is one of structural level is inherent to the thinking behind *Kontakte*, however.

'The Unity of Musical Time'

The implications of this theory are vastly profound. It is beyond the present remit to explain it fully; Stockhausen goes into far greater detail in his article, *The Concept of Unity in Electronic Music*, from which the quotations are taken.

... I would like to discuss ... the correlation of timbre, pitch, intensity and duration. In the past, it has been customary to regard these correlative properties of sound as mutually independent, as belonging to fundamentally different spheres. They have appeared increasingly separate as our acoustical perception developed along such lines.

... In the preparatory work for my composition *Kontakte*, I found, for the first time, ways to bring all properties under a single control. I deduced that all differences of acoustic perception can be traced to differences in the temporal structure of sound waves.

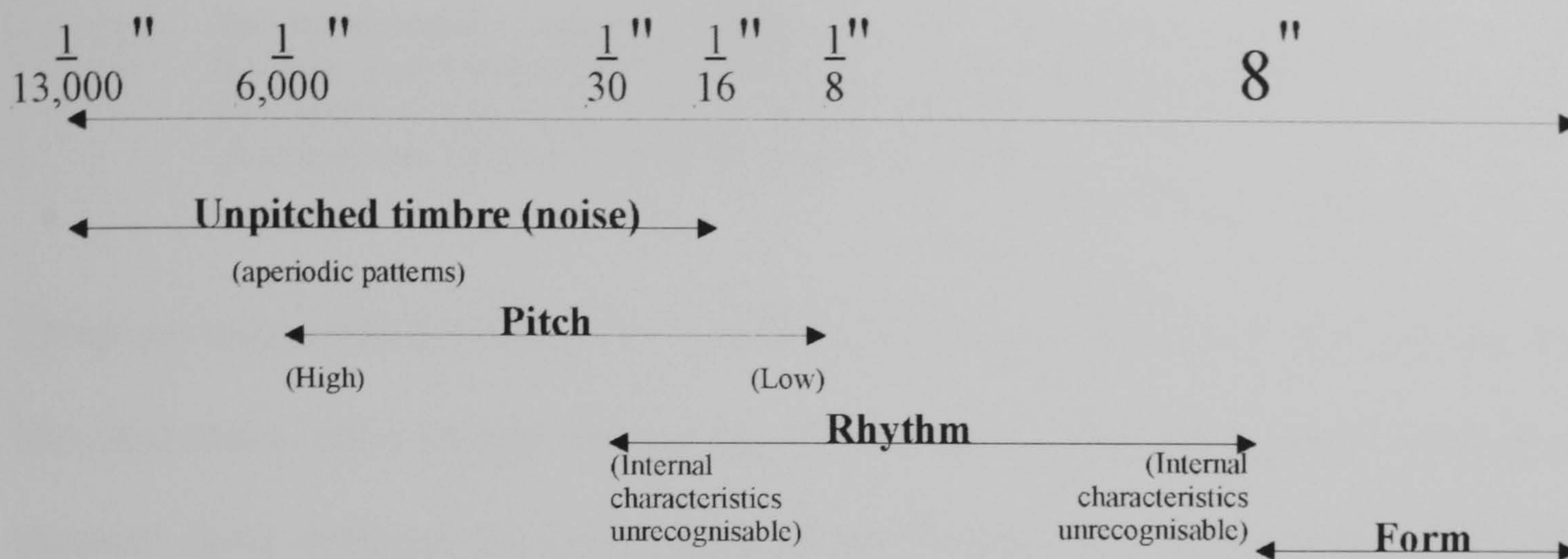
(Stockhausen, 1962: 39-40)

If ... all of the experiential properties of sound could be traced to a single principle of ordering... compositional thought would have to be radically reorientated.

(ibid: 41-2)

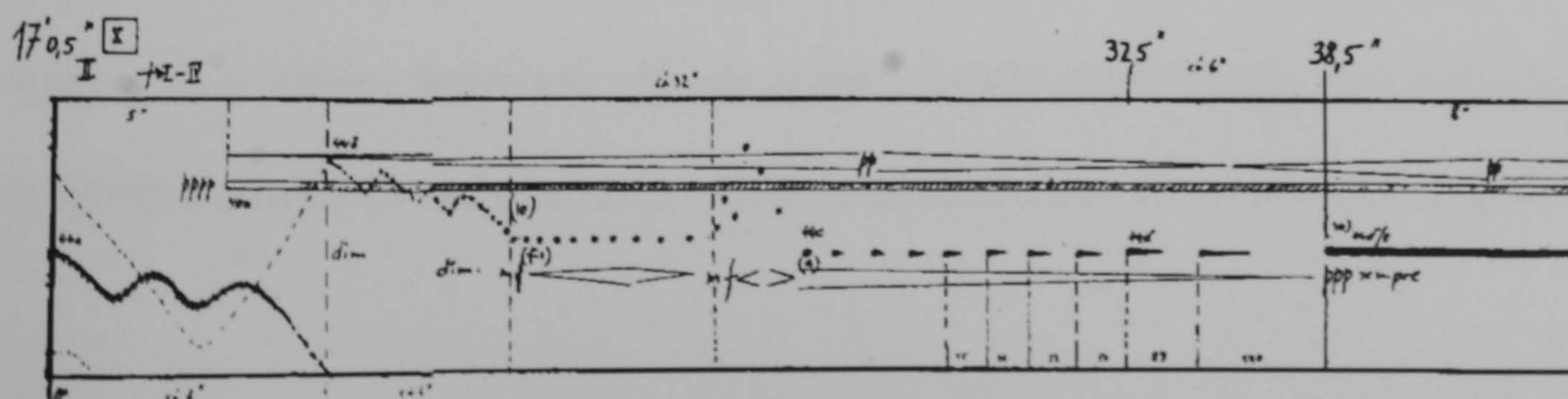
In making *Kontakte*, Stockhausen produced sounds by recording patterns of impulses from an impulse generator on to tape loops. By vastly speeding them up, the rate at which those (micro-)rhythms recur is increased beyond the point at which the individual impulses can be experienced. Instead of rhythms, the mind perceives sound waves whose qualities of pitch, timbre, and intensity are all determined by the initial pattern. As such, for any sound, those dimensions are characterised by the distribution and organisation of events over time, an idea which holds at the formal level. Effectively this implies the conception of a single unified continuum of musical time, of which pitch, timbre, rhythm and form are different parts. This can be difficult to grasp, and is expressed more clearly below:

Ex. 2.6:



The numbers shown on the diagram refer to the rate at which the pattern, or distribution, of impulses recurs per second. Importantly, they are approximate, and the various parts of the continuum blur into one another – there is no absolute point at which noise becomes pitch, for example. Moving from left to right, listeners' perception gradually changes from un-pitched timbre to that of form as the rate of recurrence decreases. Effectively then, according to Stockhausen, all of music can be understood as offering a range of simultaneous perspectives on musical time; whereas we perceive pitch, rhythm and timbre as different aspects of sound, they are actually all contained within one super-dimension. This is a beautiful abstract idea, and it is communicated equally as exquisitely in perhaps the most famous part of *Kontakte*. Approximately half way through the work, a single sound passes fluidly through this notional continuum of musical time. The relevant part of the realisation score is shown below.

Ex. 2.7:



Stockhausen explains that

The initial sound ... slides ... about 7½ octaves downwards, passing through the zone where perception of pitch modulates into perception of rhythm, where perception of “tone-color” merges into that of “melody,” and thus the “color” is dissolved into a succession of individual “pitches.”

(Stockhausen, 1962: 46)

There are many manifestations of *contact* in the work, between the instruments and the electronics, for example (as in Ex. 2.5, above), or between sounds moving in physical space between the four loudspeakers. Perhaps most importantly, as in this example, ‘the ‘contacts’ of the title may...be understood as happening among the parameters, and also between the domains of pitched sound and noise...’ (Griffiths, 1995: 143). *Kontakte* plays upon the nature of perception in this manner throughout, effectively turning the question of *what* listeners perceive, be it instrumental or electronic, pitch, timbre, rhythm, or noise, into one of *how* they are perceiving. By implication, the work denies listeners any fixed imagined framework in which to receive or situate musical information, since that which it offers constantly changes in ‘type’. Considered thus, it is a counter-pole to the Mozart, which provides, indeed generates, such a framework.

Closing Down on Counter-poles

The starting point for this chapter was that these iconic works, the archetype and the antitype, must be related at some fundamental level, even if merely by polar opposition. So far, discussion has revealed that there are indeed equivalences, although these cannot constitute parallels in terms of listener perception. In the *Symphony in G Minor*, harmonic closure generates structural levels, and thus there is an inherent dynamic in the extent to which musical events fit within that framework.

Kontakte stands in opposition to this, although importantly that does not imply that it is concerned with the extent to which events do *not* fit. Effectively, that is inherent to the Mozart, as the concept of fit is dependent on its opposite. Rather, in *Kontakte*, notions of closure, structural framework and hierarchy do not apply.

Essentially, closure serves to fix patterns, thus to link events, in time. It is therefore dependent upon consistency in the *type* of event; for those connections to have relative significance there must be sufficient ground for equivalence. For example, because closure is brought about harmonically and melodically in the *Symphony*, it is dependent specifically upon pitch-events. A prerequisite, therefore, is the differentiation of musical dimensions such as pitch, timbre and rhythm. Contrary to enabling listeners to make such perceptual distinctions, *Kontakte*, in accordance with its name, conjoins discrete pitches not only with each other but also with timbre and rhythm. The difference is not that closure *does not* occur in the Stockhausen, but that it *cannot*, without the separating out of musical dimensions; where it is essential to classicism, it is impossible within this high modernism. In this sense, these two works are fundamentally related, although as counter-poles, in that they present opposite positions on the notion of closure as a basis for significance.

Underlying closure is the notion of 'pattern', which implies the inclusion within a larger unit of certain elements (and subsequent exclusion of others) from an ongoing stream of information. Crucially, these two works are conducive to different approaches in the mental processing of that stream. The closed patterns of the *Symphony in G Minor* invite perceptual division of time; in *Kontakte*, time is conceived as fluid. This is paradoxical: the classical archetype of symphonic continuity is inherently discontinuous; the fragmentary icon of modernism presents time as an uninterrupted flow.

In the Mozart, closure brings about 'fixed' significance. A given pattern can be perceived as a satisfactorily unified whole, with a particular 'meaning' or expressive value relative to the others around it. Importantly, satisfactory closure implies resolution to a *specific* harmonic or tonal centre at a *specific* point in time. Therefore, if, at the projected point of closure, this does not occur, there is a stark contrast between expectation and perception. Where the mind *had* prioritised the significance of one *particular* (imagined) event, there are multiple possibilities in its absence. This is manifest in the *G minor* in an inherent temporal dynamic between fixity and ambiguity. By contrast, in *Kontakte* the impossibility of closure prevents any such stable-unstable perceptual framework. Rather, everything within its single, unarticulated dimension of musical time is consistently fixed and/or ambiguous. This is borne out in the radically different formal conceptions of these two works.

Moment Form and the Diversity of Musical Times

In moment forms

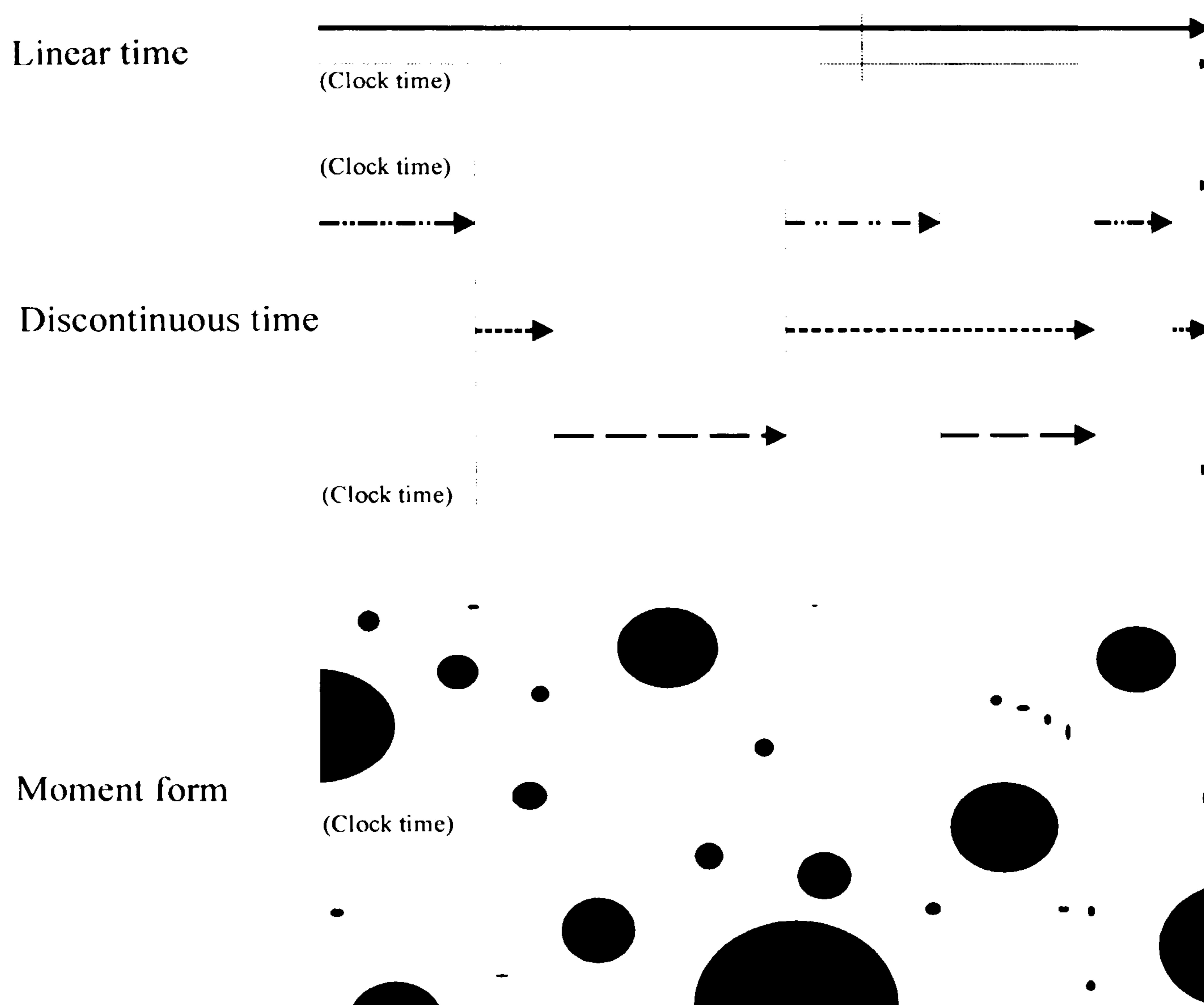
... we start with completely separate instants: Now! Now! Now! Now!
Now! – and then begin to determine how much memory or hope each
Now may have – how much it may be related to what happened before
or what will happen next.

(Stockhausen, 1989: 67)

Each of those instants is a moment: a slice of material of any length, juxtaposed with others. This might seem to imply that this conception is merely one of surface discontinuity, although the implications of this idea are far more profound. These formal segments are 'self-contained entities, capable of standing on their own yet in some nonlinear sense belonging to the context of the composition' (Kramer, 1988: 207). Such structural independence implies that a given moment has no added

significance in relation to any others, instead assuming meaning only in relation to itself. The all-important term here is 'non-linear', since it has significance above and beyond discontinuity, instead implying the negation of continuity as a concept. The difference between these states of affairs is expressed diagrammatically below.

Ex. 2.8:



In linear time, a musical beginning, middle and ending follow on from one another, as in the Mozart. The second example represents discontinuity, as found in the works of earlier twentieth-century composers such as Debussy and Stravinsky. Typically, such music presents a broken chain. The temporal flow is disrupted, although events are recognisable as belonging to, and as extensions of, that particular chain. Although these first two instances imply an opposition between continuity and

discontinuity. they share the notion that time is linear; both imply time as a single axis, albeit fragmented in the second instance. Moment form stands independent of both, since it denies that underlying concept of connectivity. Conceptually, should temporal direction be perceived, it exists between points within a multi-dimensional field (this exposes the 2-D inadequacy of the diagram), rather than points within a continuum. Thus, clock time is merely an arbitrary trajectory with no functional connotations regarding the beginning or end of the form.

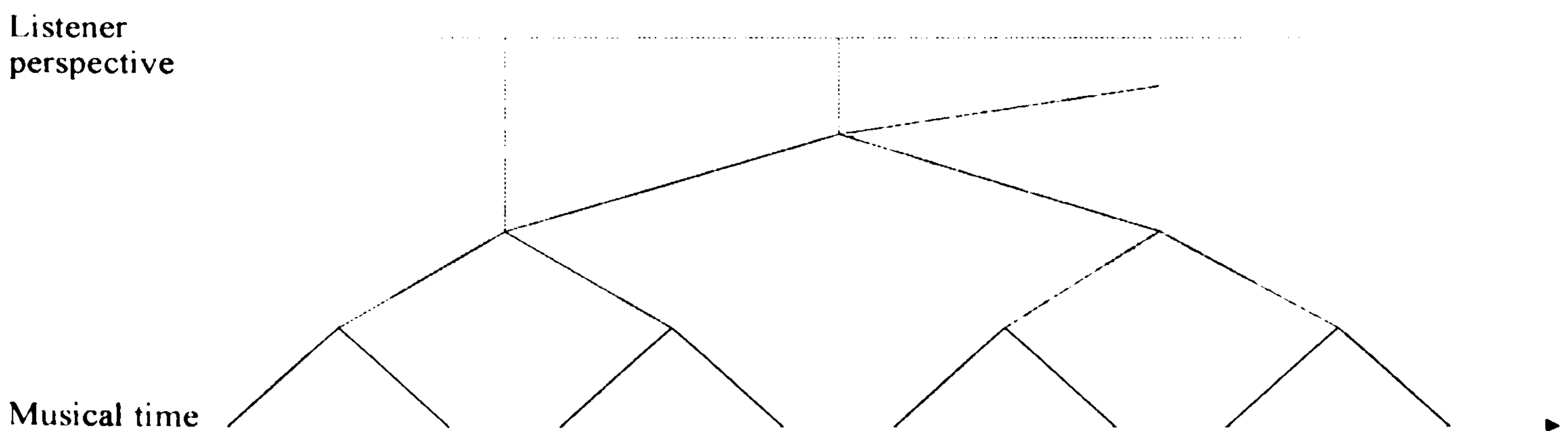
Wörner explains the difference between musical 'beginnings' and 'endings' as opposed to 'starts' and 'finishes'. In the case of the former, some kind of musically logical conclusion is reached. Between a beginning and ending an issue inherent to the material is presented and resolved, or at least developed, meaning that there is a perceptible musical 'argument', or process which progresses through time, as in sonata form. In contrast, moment forms simply start when the sounds commence and finish when they cease. A prerequisite is that 'causal' links between musical events are insignificant, requiring there to be no overarching or underlying dialectic which might provide a 'reason' or 'explanation' for a moment-form (or any part thereof) to start or finish at any particular time or in any particular way. Effectively, moments are presented as 'excerpt[s] from a continuum', which has no inherent 'end' (Wörner, 1973: 108). Thus, the past and future are reduced to irrelevance; at any given moment, form illuminates and intensifies the present: 'Now! Now! Now! Now! Now!'...

Importantly, this subverts the roles played by memory and expectation, which situate events in relative positions along a single temporal axis. Put more poetically, listeners must abandon those aspects of perception in order to experience the ever-present: timelessness. *Kontakte* is indeed a challenge to perception, embodying both

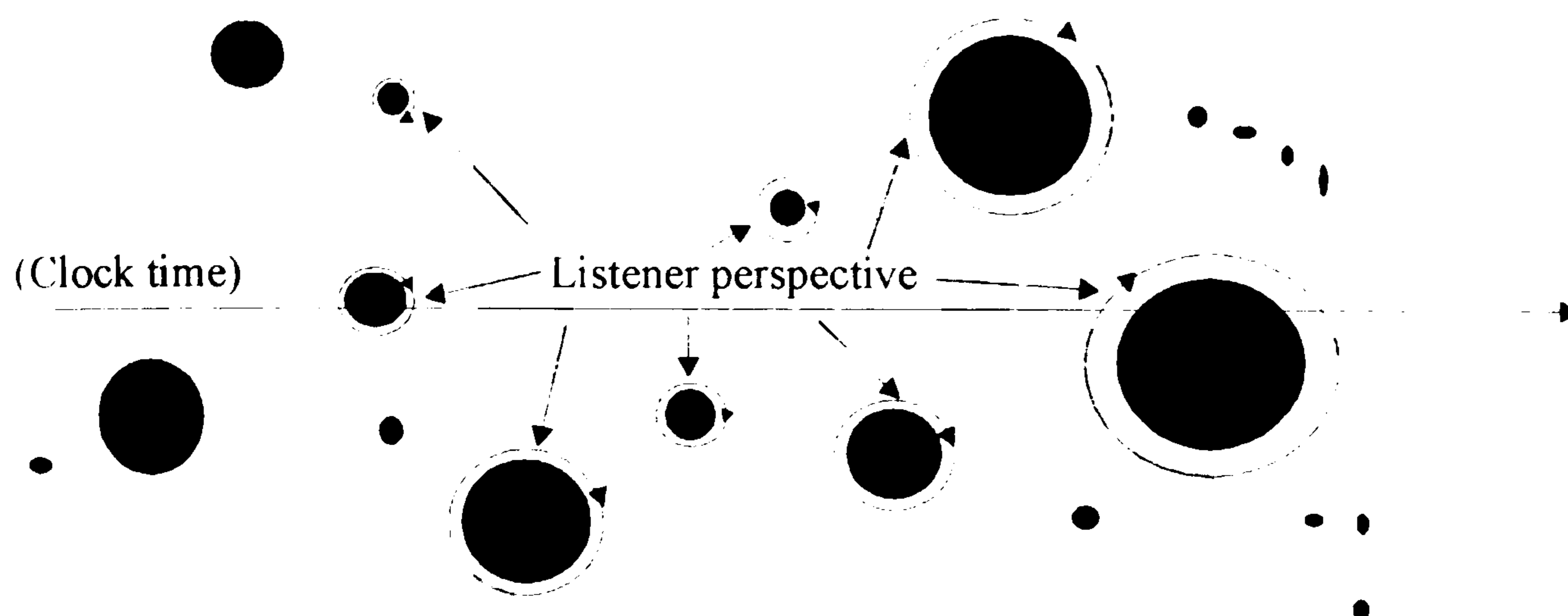
the unity of musical time and the first manifestation of moment form: and inevitably, these ideas have implications for the listening experience.

As explained above, Stockhausen deduced that pitch, timbre, rhythm and form are effectively different zones within a continuum of the rate at which musical time passes. This means that in order that pitch might be perceived as the structural force governing the *Symphony*, it is taken for granted that musical time passes at a single, even rate overall. By analogy, to hear those phenomena as separate musical elements implies that the listener's experience takes place from a 'fixed perceptual position' relative to the super-dimension shown in Ex. 2.6, and from that implied 'viewpoint', timbre and rhythm are consistently subordinate to pitch events. Thus, to hear a tonal structure is to observe the passage of musical time from an ongoing, parallel perspective, as shown below.

Ex. 2.9:



The *Symphony* embodies what Stockhausen calls the 'traditional concept...that things are in time, whereas the new concept is that time is in the things' (Stockhausen, 1989: 96). In *Kontakte*, the rates at which patterns recur vary to the extent that its moments might be perceived as timbre, pitch, duration, or a combination of these: hence the equivalent diagram:

Ex. 2.10:

The listeners' perspective is in a state of perpetual change from one causally disconnected moment to the next. There are strong links between this concept of thinking and relativity (Stockhausen, 1989: 100-101), as discussed below. (For present purposes, this discussion refers to the electronics-only version of *Kontakte*.)

The work is divided the work into 16 strukturs, and there is a marked difference in the behaviour of the sounds in strukturs I and II. The first is subdivided into six sections, the first five of which (IA-IE) consist of a sequence of states and events (collections of sounds notated as occurring within the same box, and spots standing outside those boxes) juxtaposed with one another and with silence. In contrast, struktur II consists of continuous and gradually transforming sounds, never more than three at a time, notated as single lines (see Ex. 2.11).

Ex. 2.11:

Nr. 12 Kontakte

Karlheinz Stockhausen




The respective natures of these two *strukturen* result in an interesting difference in perceptual effect, which might find a broad analogy with visual art. In a landscape painting, various objects are shown within a small-scale depiction of a large space, implying an emphasis on the global perspective. Thus, the visual composition is ‘about’ how the parts make up the whole image. Similarly, in (sub)*strukturen* IA-IE, listeners cannot process the internal relationships in each state due to the sheer quantity of sonic events. Instead, saturated with information, they must take an overall perspective on the collective behaviour of each group of sounds: temporal characteristics (as opposed to rhythm), timbral similarity, and so on. By contrast, the gradual nature of change in *struktur* II means that listeners can focus on the transformation of single sounds: changes of pitch and dynamic. This is more like a portrait, which induces a ‘closer’ perspective from which the viewer is free to concentrate on the *details* of objects, since it is clear how the (few) things depicted contribute to the sum of the picture.

Essentially, this analogy concerns the relationship between form and content. The slight change in pitch at 11,9” in *struktur* II (see Ex. 2.11) is, at that point, as dynamically important an event as the commencement of a new state in *strukturen* IA-IE, on account of the shift to ‘portrait’ from ‘landscape’. Thus, changes in the listening perspective might seem to provide snapshots of a continually changing relationship between form and content. Effectively, however, there is no such distinction, since each moment is heard on its own terms and not as part of an overarching shape. This explains how temporal linearity is negated, as opposed to ruptured, since it implies not only a lack of connectivity between these *strukturen* but the absence of an underlying relativity in which to frame perceptions.

The above explains the implications of contrasted listening perspectives for moment form-and-content, taking strukturs IA-IE and struktur II as an example. However, the shift between those perceptual 'viewpoints' is not as abrupt as this might seem to suggest, due to the nature of struktur IF. Coenen explains that a 'parameter in relation to the moment can be called "temporal tendency," and ranges from *Prozess* (dynamic structure) to *Zustand* (static structure)' (Coenen, 1994: 213). Struktur IF errs on the side of the former, *Prozess*, since for want of a more suitable term, it provides a sense of transition (see Ex. 2.11). There are still bold contrasts. However, these are less marked than in the preceding moments, since continuous sounds of the sort which comprise struktur II are introduced, serving as intermediate elements between sonic states and silence. Crescendi and diminuendi are also used, as well as sectional overlaps. Over the course of the substruktur, graduality of change is introduced in the place of abrupt juxtaposition. Crucially, this implies that transformations occur over time, alongside a gradual shift in listening perspective.

This seems contrary to the concept of moment form, implying temporal connection between strukturs IE and II; IF serves as a link between the 'then' and the 'next', rather than standing as a 'now' in its own right. Granted, it is an attribute of sonic behaviour (the rate at which change occurs) rather than a substantive relationship that gives rise to this sense of conjunction. This still seems inconsistent with moment form, since it implies a division between form and content, a multi-levelled listening perspective. Crucially however, *prozess*-moments such as this are essential to the negation of temporal connectivity on the large-scale: were the entirety of *Kontakte* to inhere only one perspective at a time a *global* dynamic would be created in the changes between those perceptual viewpoints. Paradoxically, it would

seem that in order to avoid large-scale significance, at times activity must occur at higher levels.

To try to take a perspective on the whole formal process of *Kontakte* is totally inconsistent with its conceptual and perceptual implications; indeed the work itself negates almost every word in the first half of this sentence. From one moment to the next, the nature of the listening perspective changes, meaning that there is no single dimension in which the work can be perceived. Therefore, any connections between points in time have no implication for the whole, since there is no consistent ground for the relative significance. As such, all of the sounds are, conceptually speaking, equally (in)significant: issues of fixity and ambiguity cannot be applied. This is in stark contrast with the Mozart, in which hierarchic structures contain events at all levels.

Mozart's Modes of Expression, and Spinning Discs

In accordance with the title, the pitches in Mozart's *Symphony* 'sound together' in G minor. Inevitably, this has implications for communication. In general, minor-mode works are more emotionally expressive than those in the major. This is not merely an arbitrary decision on the part of the composers, nor a sign that they necessarily suffered any greater emotional turmoil in creating these pieces. Rather, there are inherent characteristics of the minor mode which makes this increase in affect possible.

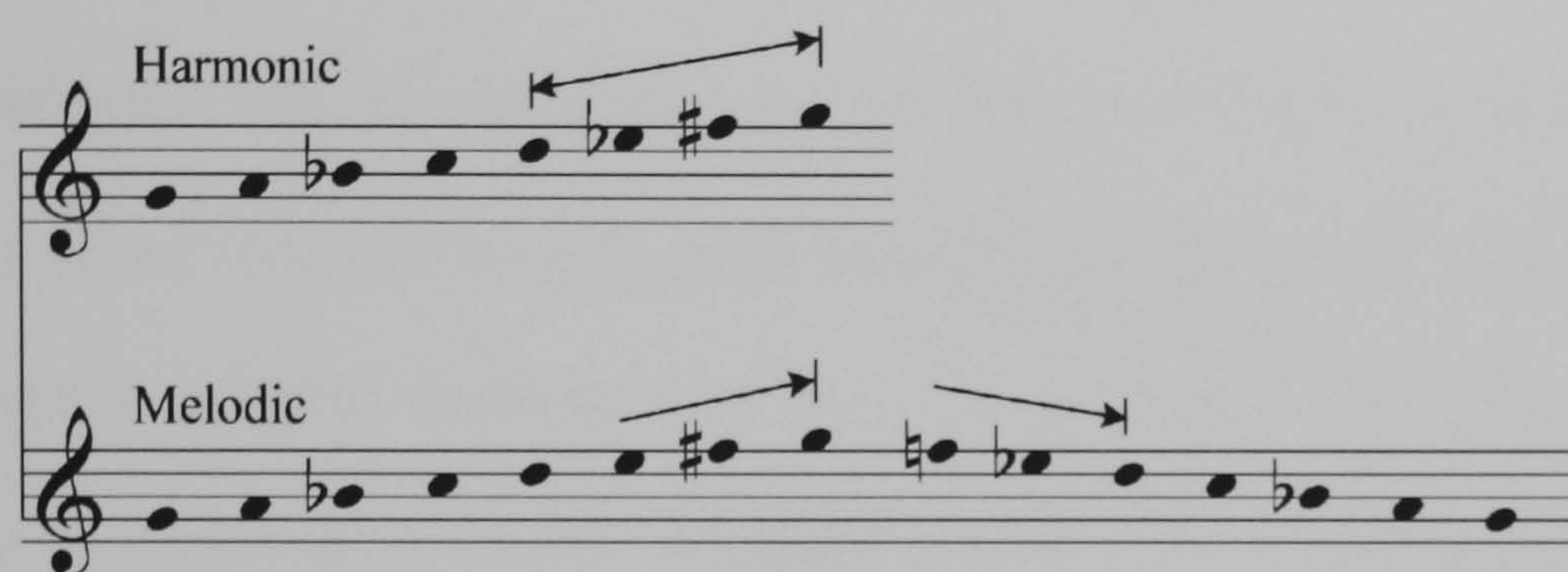
... a major chord is ... more stable than a minor one, which is ... an essential fact in comprehending the expressive significance of tonal music.

The minor mode is essentially unstable... it does not clearly define a movement to another tonality, but is an unstable and more expressive form of the same key.

(Rosen, 1997: 25-6)

Part of the stability associated with major keys is that they are unequivocally identifiable by a single set of seven pitches within the octave. In contrast, minor scales exist in three versions, meaning that they offer literally more possibilities for expression. Thus, even the term 'G Minor' is inherently ambiguous, since it can be used to refer to more than one scale (see below).

Ex. 2.12:



The lower portion of the scale is fixed, containing the same pitches in all three instances, although the upper part varies from one version to the next: the sixth oscillates between E^b and E^{\natural} , and the seventh between F^{\natural} and F^{\sharp} . Those degrees of the scale perform different functions in accordance with their harmonic gravity, as marked. At a simple level the theoretical implications are easy to grasp; the minor mode is inherently unstable due to the multiple possible functions of certain of its members. In turn, there are practical consequences. The composer of a minor-mode symphony faces the challenge of bringing about and controlling tension and ambiguity in an already tense and ambiguous context. A crucial resource, one which is specific to the minor scale, is the diminished seventh chord.

This chord plays a unique role within tonality. Like all sevenths it is harmonically tense, but in addition it is tonally ambiguous. It consists of three minor thirds stacked on top of each other, resulting in a symmetrical division of the octave.

Considered thus, it seems paradoxical that it brings about any tension at all, given its characteristic evenness; theoretically there are no issues to resolve.

However, as evidence of the human need to recognise and impose organised patterns, tonal stability itself is inherently inconsistent, since its fundamental premise is that certain pitches are perceived as more important or stronger than others. Due to the lack of a perfect fifth to divide the octave asymmetrically, diminished sevenths deny potential for harmonic anchorage on any one pitch. Instead, they comprise interlocking tritones; and this intensifies the necessity for harmonic resolution, since a change of any of the four pitches is a move towards inconsistency, towards stability.

Perhaps a suitable metaphor for the role played by this chord is that of a spinning disc, as presented in the diagram below. The equal significance of its members suggests circularity, and the intense need for resolution connotes unreleased energy – by implication, movement must occur. That energy might be released in a number of directions, as the chord might be resolved in a number of ways, some of which are shown in Ex. 2.13.

Ex. 2.13:

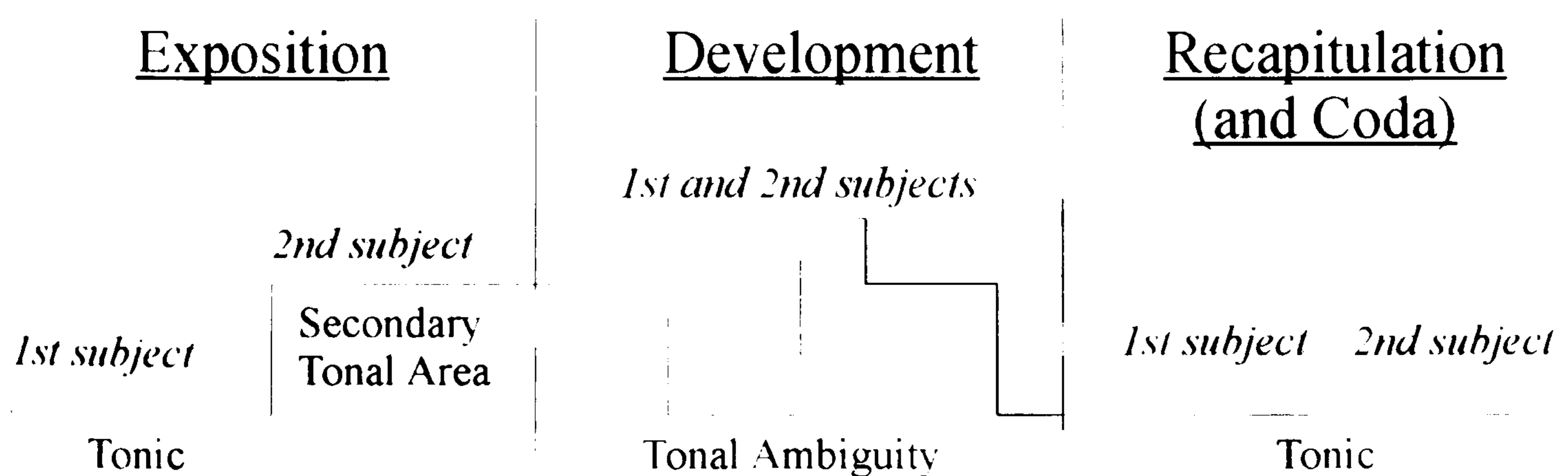


Crucially, the ambiguity which characterises this chord arises out of its inability to resolve without tonal implication. Any change of pitch commences motion towards a new potential tonic, imbuing the diminished seventh with the power to effect modulation in a number of directions. As such, it serves to conjoin structural levels, since it both necessitates local harmonic resolution and potentially sets in motion large-scale tonal change. This has particularly interesting connotations for conceiving of how tonality operates within sonata form, since it implies that this ambiguous chord has the potential to play a role of equal importance to tonally stable material in determining global shape. This suggests particular considerations for analysis of the overall form.

Sonata Form

Sonata form, in which this and most symphonic first movements are cast, fundamentally involves the presentation and development of thematic ideas in different keys, as shown below:

Ex. 2.14:



Despite the vertical division into three sections, horizontal momentum is generated by the ongoing tonal argument. Tension arises from the initial departure from home at

the second subject, intensifies in the development, and is resolved in the recapitulation. Globally, therefore, the form is often conceived of as goal-directed, as all activity leads to that final resolution. However,

The symmetry of sonata form which the nineteenth century tried to codify was in the eighteenth a free response to symmetrically ordered material, and the symmetry could take many forms, some of them surprisingly complex. That some form of symmetrical resolution was felt as essential to the sonata (and to almost everything else) is unquestionable: in the rare cases where the material implied either a markedly asymmetrical resolution, or a form...that is relatively unarticulated, the result was a Fantasy.

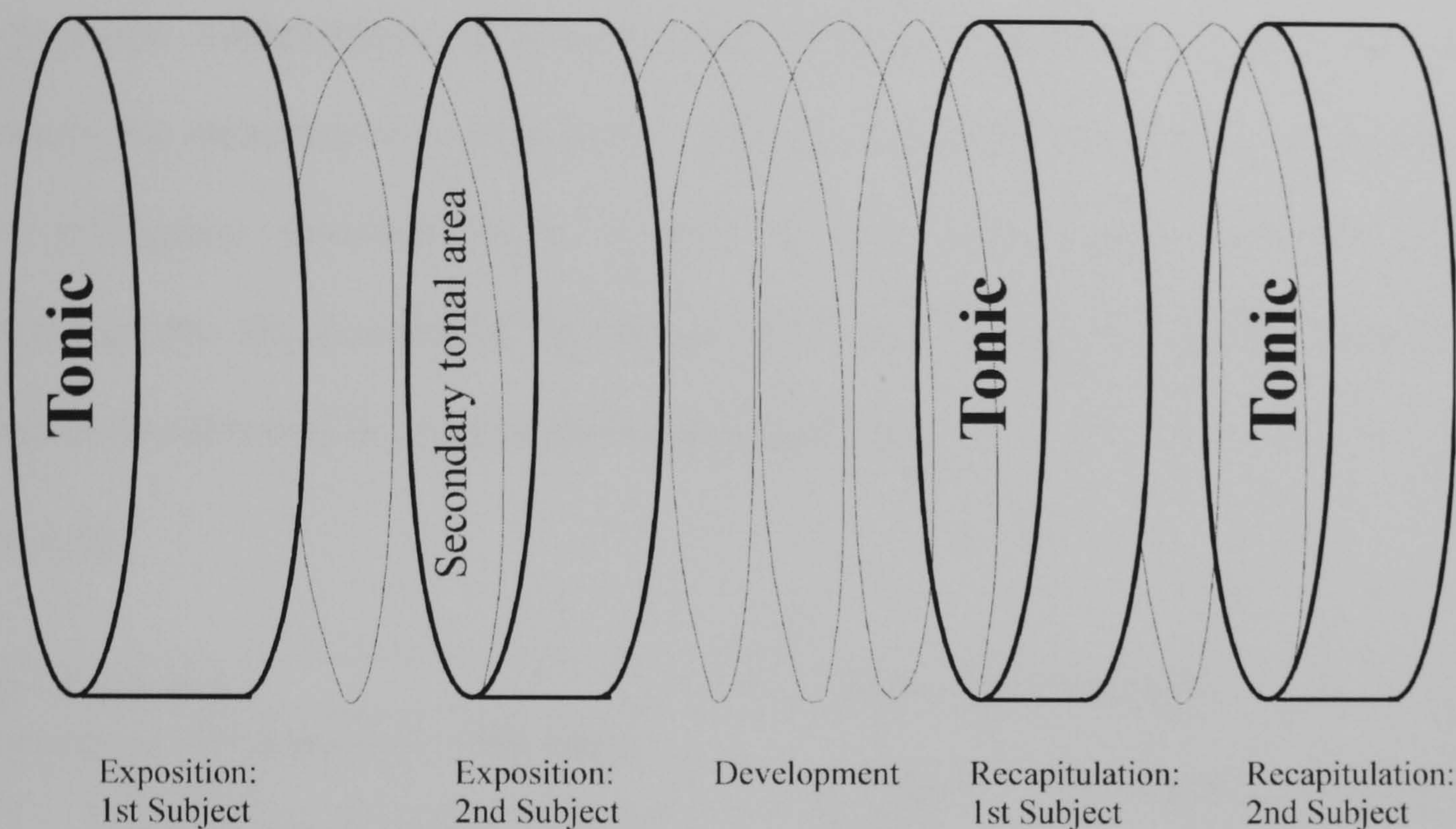
(Rosen, 1997: 91)

Symmetry implies centricity rather than directionality, balance around one or more inner fulcrums as opposed to movement towards an ultimate point. This does not invalidate Ex. 2.14; the diagram is an objective representation of how tonal and thematic activity belongs to a single, unified shape. Importantly, however, sonata form is experienced as a hierarchical system rather than merely from one global tonal perspective. Indeed, its vitality – its temporal momentum – is dependent upon oppositions between structural levels: as events are closed locally, they might be ongoing at a higher level. Thus, the balance between fixity (as defined by resolution to a particular harmonic centre) and ambiguity (the bringing into question of the prevailing tonal centre) is continually revisited. Rather than tensions between tonal centres, such interaction between structural levels is what generates the ongoing formal dynamic. Sonata form is concerned less with the significance of pitches than with the ways in which they signify.

The idea that large-scale temporal momentum arises out of the continually shifting balance between ambiguity and stability suggests a more detailed conception of overall form than that shown in Ex. 2.14. Taking a single perspective on the whole, that linear model presents a succession of blocks of material which are tonally and temporally fixed, which seems untrue to the nature of a relationship in constant

flux. Perhaps the model proposed below goes some way towards representing the various perspectives which inform the listening experience (see Ex. 2.15).

Ex. 2.15:



Harmony is presented as a circular plane, orientated vertically, whilst tonality, changes in which occur over longer time spans, is shown along the horizontal. The logic behind this is simple. Within a single key, order within the octave is maintained; and as stable pitches recur, their structural significance is reiterated, implying circularity. As successive chords form harmonic progressions, they are figures within a constant ground, provided that the key does not change. On that basis, modulation implies that the ground itself shifts. By implication, the underlying organisation of tonal space is in flux, meaning that time moves forward on the large scale. As such, that which was constant, changes, implying temporal momentum, represented as spiral motion. This is not intended as a map of the movement under consideration here. Rather, it is an attempt to present more clearly the balance between those parts of the sonata-form model which are tonally ambiguous and those which are stable; the

development is, in some sense, merely an extended transition between the exposition and recapitulation.

The idea that the whole sustains an ongoing relationship between fixity and ambiguity, rather than serving to confirm the authority of a particular tonality, implies a particular interpretation of how its parts function. Considered as goal-directed towards the recapitulation, each formal segment has attendant tonal characteristics; the ambiguous development is framed by the more stable exposition and recapitulation. On account of the minor-mode tonality, many structural functions seem to be subverted in this movement, as outlined below.

Ex. 2.16:

Bar	Material	Duration	Tonality
Exposition: 100 bars (x 2 = 200 bars)			
1	1st subject	19 bars	Gm, transition to D major
20	1st subject (used to trigger transition)	8 bars	Gm
28	<i>Transition theme</i>	16 bars	B \flat
44	2nd subject (a)	14 bars	B \flat
58	2nd subject (b)	14 bars	A \flat , moving to B \flat
72	2nd subject (c): synthesis of 1st and 2nd	16 bars	B \flat
88	<i>Coda-like scalic movement leading to cadence</i>	13 bars	B \flat
Development: 66 bars			
101	1st subject passed between Vlns and	38 bars	Unstable, ending in Dm
139	1st subject fragments leading to V pedal in Gm	28 bars	Unstable
Recapitulation: 110 bars			
166	1st subject	17 bars	Gm, transition to D major
183	1st subject (used to trigger transition)	8 bars	E \flat
191	<i>Transition theme</i>	7 bars	E \flat
198	▪ <i>Transition theme: stretto and synthesis with 1st subject</i>	13 bars	Fm
211	▪ <i>Transition theme</i>	16 bars	Gm
227	2nd subject (a)	14 bars	Gm
241	2nd subject (b)	6 bars	E \flat
247	<i>Transition theme variation</i>	7 bars	Unstable
254	2nd subject (b) cont.	6 bars	Gm
260	2nd subject (c) : synthesis of 1st and 2nd subjects	16 bars	Gm
Coda: 24 bars			
276	<i>Scalic material</i>	5 bars	Gm/Dm
281	<i>Chromatic ascent</i>	4 bars	Chromatic on G
285	<i>Stretto fragmentation of first subject</i>	8 bars	Unstable Cm, G-Pedal
293	<i>Cadence in G minor 293-299</i>	7 bars	Gm

Exposition

Broadly speaking, a sonata-form exposition has three parts: the first subject thematic group, a transition, and a second subject group in a different key. Theoretically the two thematic groups ought both to be tonally stable, the intervening modulatory passage smoothing the opposition between them. Here, rather than gradually moving away from the tonic, the transition seems to interrupt the first subject mid-flow. In fact, the modulation is 'hidden' within the first subject, which is repeated at bar 22 using the melodic minor (itself a different perspective on B^b major) as a harmonic resource:

Ex. 2.17:

Bar 22

Woodwind

Horns

Violin 1

Violin 2

Viola

Violoncello

Wwind

Hn.

Vln. 1

Vln. 2

Vla.

Vc.

In itself, the transition theme could hardly be more stable (starting with a I-V-IV-I progression), and this relative strength is enhanced when set against a first subject which itself moves away from the home key, first to D major (at bar 16, see Ex. 2.2), and then to B^b major, as above. This formal mismatch – an unstable first subject followed by a stable transition – is intensified further by comparison with the second subject (see below).

Ex. 2.18:

Bar 44

The musical score for Ex. 2.18, starting at Bar 44, is arranged for four instruments: Woodwind, Violin 1, Violin 2, Viola, and Violoncello. The key signature consists of two flats (B-flat major or D minor). The woodwind part begins with a rest, followed by a highly chromatic melody in the next measure, characterized by numerous accidentals and a complex rhythmic pattern. The string parts (Violin 1, Violin 2, Viola, and Violoncello) provide harmonic support with various rhythmic patterns and accidentals, including some chromatic lines.

The tonic chord, B^b, is not stated in full at any point, and the highly chromatic melody and harmony seems far from stable in that key. Effectively, conventional formal functions are *inverted* rather than merely subverted here: the subject groups seem far more transient than the transition itself. Both subjects cadence with sufficient regularity to belong clearly to their respective keys, however; none of these are instances of actual tonal ambiguity.

More interestingly from the point of view of the balance between ambiguity and fixity, the diminished seventh appears at important points in the thematic process. Bars 16-20 mark the end of the first subject, involving transient modulation to the dominant; the passage between bars 34 and 44 confirms B^b as the secondary tonal area in readiness for the second subject, and finally, at bar 73 resolution precedes the

synthesis of the two principle melodies. In accordance with the proposed model, these events are shown below as spiral motion.

Ex. 2.19:

The image displays a musical score for Ex. 2.19, illustrating spiral motion. It consists of several parts:

- Top Left:** A score for Bars 16-20, featuring Woodwind, Horns, and Strings.
- Top Right:** A score for Bars 34-44, featuring Woodwind, Horns, and Strings.
- Center:** A diagram showing spiral motion between three sections: Bars 16-20, Bars 34-44, and Bars 62-72. Each section is represented by a small musical staff with notes and rests, connected by curved lines that spiral inward.
- Bottom Left:** A score for Bar 62, featuring Woodwind, Horns, and Strings.
- Bottom Right:** A score for Bars 62-72, featuring W. W. (Woodwind), Horns, and Str. (Strings).

Albeit in different ways (as a substitute for the dominant, a chromatic ornament, and a passing chord respectively) the same diminished 7th is used in all three instances. This might seem irrelevant, but it implies that the sonority which generates ambiguity is actually constant, whereas the areas of tonal fixity change around it. This is quite opposed to the function of the exposition within a goal-directed conception of sonata form, since it suggests that this opening serves to establish balance between fixity and ambiguity, rather than to fix the significance of opposed tonal centres.

Development

As mentioned above, the development functions as a large-scale modulation to the home key. Thus, it must move away from the secondary tonal area and start back towards the tonic. Here, it starts with a moment of tonal violence rather than bringing about gradual transition. Immediately following the 60-bar second subject in the relative major, there is a cadence in the home key within two bars, followed immediately by the utmost tension and ambiguity: the 'wrong' diminished seventh resolves to present the first subject in the 'wrongest' key, F[♯] minor.

Ex. 2.20:

Bar 98

Woodwind

Horns

Violin 1

Violin 2

Viola

Violoncello

Wwind

Vln. 1

Vln. 2

Vla.

Vc.

Resolution to a G minor triad is extremely cumbersome from this chord. Instead, that harmonic spinning disc comes to rest in one of the remotest tonal areas, the leading-note minor. Because of this, all of the scale functions change; and most significantly the weakest member of the home key is transformed into the strongest pitch at this point. From here the harmony moves back towards the tonic in readiness for the recapitulation, as the first subject is fragmented, leading to a repeating imperfect cadence in D minor between bars 133 and 138, the centre of the development (and thus, but for the repetition of the exposition, of the tonal argument). This is a far less remote tonal area than F[#] minor, since there is only one pitch class in the collection

which is not found in G minor. Interestingly, this implies a reversal of the scale functions at the mid-point of the formal dialectic (see Ex. 2.21).

Ex. 2.21:

The diagram shows two musical staves. The top staff is labeled 'D Minor' and the bottom staff is labeled 'G Minor'. Both staves show a sequence of notes. Above the D Minor staff, a horizontal line with arrows at both ends is divided into two sections: 'Fixed' on the left and 'Ambiguous' on the right. A double-headed arrow is positioned at the midpoint of this line. Below the G Minor staff, a similar horizontal line is divided into 'Fixed' and 'Ambiguous' sections, also with a double-headed arrow at the midpoint. Dashed lines with arrowheads connect the notes in the 'Fixed' region of the D Minor staff to the 'Fixed' region of the G Minor staff, and the notes in the 'Ambiguous' region of the D Minor staff to the 'Ambiguous' region of the G Minor staff, illustrating the reversal of scale functions.

Where in the home key the space between D and G might be occupied in a number of ways, in D minor that area is fixed, notably filled-in by E^{\natural} and F^{\natural} , the only combination of E- and F-related pitches which does not belong to a single version of G minor. In terms of scale functions, therefore, the relationship between fixity and ambiguity is inverted at this central point of the development, in readiness for the move back to the tonic. In the second half of the development, D acts as a dominant pedal, and the scale functions shift around it: the original relationship between fixity and ambiguity is restored in readiness for the recapitulation.

Recapitulation

The name of this third formal segment suggests that its function is to provide global closure, confirming the authority of the tonic. Everything capitulates once more to the initial order, as all of the themes are repeated in the home key. This implies an interesting role for recapitulatory transitions, amongst which the present example is

‘one of the most interesting instances...’ (Schoenberg. 1954: 143). This passage is essential for the balance of the melodic and tonal structure, as it balances out the equivalent passage in the exposition, although it is structurally redundant in a goal-directed conception of sonata form, since no modulation is required. At the start of the recapitulation, G minor is established as a strong tonal centre on account of the preceding dominant pedal, implying that tonal fixity and ambiguity are clearly-defined and opposed states. As the movement approaches its end, however, that distinction becomes increasingly less valid. This is explained relative to Ex. 2.22 (overleaf), which shows the spiral motion involved in this transition.

Initially the first subject re-establishes the authority of G minor. In a repeat of the opening, the diminished seventh on C[#] resolves to the dominant, which in turn capitulates to the tonic chord (bars 179-185 balance bars 16-22). As in the exposition, the first subject triggers a transient modulation, although this time the melody is altered to include A^b, initiating modulation to E^b major, in which the transition theme is first heard (bar 191). Following this, that same diminished seventh resolves twice to F minor. This would seem to suggest that that key would be sustained, although this is not the case; a harmonically mobile development-like passage ensues, in which variations upon the first subject and the transition theme are set against each other. During those bars (203-211), cadences occur in a new key in almost every bar.

Ex. 2.22:

The diagram illustrates the relationships between various musical themes and their repetitions across a sequence of measures. The themes and their locations are as follows:

- First subject:** b. 166 (F minor), b. 180 (E-flat major), b. 184 (E-flat major), b. 185 (F minor).
- Transition theme in F minor:** b. 191, b. 192, b. 203.
- Transition theme in E-flat:** b. 202, b. 204, b. 205, b. 206, b. 207, b. 208, b. 209.
- Transition theme in G minor:** b. 210, b. 211.
- Other measures:** b. 217, b. 220, b. 221, b. 227.

Arrows indicate the following relationships:

- From b. 166 to b. 180 (First subject).
- From b. 180 to b. 184 (First subject).
- From b. 184 to b. 185 (First subject).
- From b. 185 to b. 191 (Transition theme in F minor).
- From b. 191 to b. 192 (Transition theme in F minor).
- From b. 192 to b. 203 (Transition theme in F minor).
- From b. 203 to b. 202 (Transition theme in E-flat).
- From b. 202 to b. 204 (Transition theme in E-flat).
- From b. 204 to b. 205 (Transition theme in E-flat).
- From b. 205 to b. 206 (Transition theme in E-flat).
- From b. 206 to b. 207 (Transition theme in E-flat).
- From b. 207 to b. 208 (Transition theme in E-flat).
- From b. 208 to b. 209 (Transition theme in E-flat).
- From b. 209 to b. 210 (Transition theme in G minor).
- From b. 210 to b. 211 (Transition theme in G minor).
- From b. 211 to b. 217 (Transition theme in G minor).
- From b. 217 to b. 220 (Transition theme in G minor).
- From b. 220 to b. 221 (Transition theme in G minor).
- From b. 221 to b. 227 (Transition theme in G minor).

The lack of sustained order within the octave at this point in the form implies that far from being strengthened, tonal stability is weakened both as a concept and a percept, meaning that, conversely, ambiguity also loses its significance. For example, after the transition theme is belatedly repeated in the home key, the diminished seventh sets off a secondary dominant progression; between bars 217 and 220 that sonority resolves to the tonic chord in three stages.

The final passage involving the diminished seventh (at bar 247), a sequentially repeated variation on the transition theme, is chromatically saturated, as it names all three versions of the chord.

Ex. 2.23:

The musical score for Ex. 2.23 is presented in two systems. The first system, starting at Bar 247, features six staves: Woodwind (treble and bass clefs), Horns (treble clef), Violin 1 (treble clef), Violin 2 (treble clef), Viola (alto clef), and Violoncello (bass clef). The second system features five staves: Wwind. (treble and bass clefs), Hn. (treble clef), Vln. 1 (treble clef), Vln. 2 (treble clef), Vla. (alto clef), and Vc. (bass clef). The score is characterized by complex harmonic textures, including diminished seventh chords and chromatic movement, with various musical notations such as trills, slurs, and dynamic markings.

Despite successive resolutions to B^b minor and C minor chords, neither of those keys is sustained; these are cadences rather than modulations. At this late stage in the form, for the first time, the final diminished seventh, that on C^\sharp , which provided tonal ambiguity during the exposition, resolves directly to a G minor chord, which forms the tonic in readiness for the coda.

Over the course of this recapitulation, the diminished seventh chord loses modulatory potency, such that by the end it is merely harmonically tense rather than tonally ambiguous. Lack of tonal movement is inherent to this part of the form, since departure to another key would undermine the ultimate authority of the tonic. It is, therefore, important to recognise that minor tonality is itself ambiguous, as explained above. Perhaps as a consequence, even the coda is not entirely stable in this first movement; it is not until the final 7 bars of the movement that material steadfastly resolves to G. Of particular note is the passage between bars 281 and 286 (see below).

Ex. 2.24:

Bar 281

The musical score for Ex. 2.24, starting at Bar 281, is arranged in a system with six staves. The top staff is for Woodwind (flute and bassoon), showing a complex chromatic line with many accidentals. The second staff is for Horns, playing a series of chords marked *sf*. The third staff is for Violin 1, the fourth for Violin 2, the fifth for Viola, and the sixth for Violoncello. The strings play a rhythmic pattern of eighth notes with various accidentals.

The idea of equal parity between tonal fixity and ambiguity is crystallised in the notion of chromatic saturation, since it suggests consistent significance within the octave. The temporal structure of these bars (stable pitches being sounded at strong points in time) means that this does not occur here, although the appearance of such chromatic material at this point is significant, particularly considering the implications for scale functions. Whilst the woodwind and violins move in semitones between G

and D (the lower, fixed portion of the G minor scale). the lower strings chromatically fill the portion between B^b and F, the equivalent in the secondary tonal area. Having been reversed at the centre of the development (see Ex. 2.21), the contrast between the ambiguous and fixed portions of the scale is lessened, since the more stable part is chromatically saturated.

The final pitch to be added is F^z, which resolves to G in bar 287, confirming its function as the leading note in the home key. The authority of that tonic is demonstrably weakened in the course of this sonata form, rather than strengthened, as one might expect. Since the G-minor background against which it is heard is inherently unstable, it is not so much the case that it is significant that even in the coda there is tonal ambiguity, but that the ambiguity in the coda is relatively insignificant. Overall, by the end of the movement, the initial opposition between tonal ambiguity and fixity is evened out; over the course of the symmetrical sonata form, they are balanced.

Resisting closure

type: a class of people or things that have characteristics in common, a kind.

(Hawkins, 1986: 888)

Obviously, the intention for this chapter was never to argue that these two works are of the same kind. Rather, the title refers to their relation to type, which is in both cases inherent to the aesthetic from which they arose. Another common feature is that they seem so clearly and comprehensively to communicate, indeed to help define their respective cultural ideals, although even slightly above that level of abstraction they seem directly opposed. Fundamentally, the *Symphony* looks outward for significance, engaging positively with its genre, where *Kontakte* makes no external references.

looking so far inwards for definition that even its internal parts are largely unrelated; it is staunchly anti-type.

This opposition between inward and outward significance resonates in terms of the intended relationships of these works with audiences. The Mozart is an 'open' work, his intention being that the public would hear its sounds together. As a result, it plays upon (then) familiar models, and, to some extent, 'directs' listeners' perceptions, framing significance within a unified hierarchy. Contrastingly, the Darmstadt-modernist audience was elitist in the extreme, often caricatured as consisting only of composers and contacts within their circle. In keeping, the acousmatic realisation of *Kontakte* ensures that perceptions are in no way guided, as no clues are given as to what might happen next, either visually or in terms of musical structure. This might seem to imply a barrier to communication, although there is a similar philosophical tension between the musical surface and the listeners' perception in the Mozart.

The *Symphony*, defined above as the more open of the two works, serves formally to contain musical dimensions in the pursuit of global closure and fixed significance; timbre and rhythm are subordinate to formal activity as defined by melodic, harmonic and tonal patterns in pitch organisation. Conversely, Stockhausen's intention was to open up such divisions of musical time and space – hence the *Unity of Musical Time* and moment form. Of course, this is largely esoteric, although it does highlight the importance of resistance to communication in the musical surface. Although *Kontakte* consists of discrete moments, the task for the listener is to experience the work as a timeless flow: the temptation both as a listener and analyst is to try too hard to understand its significance. Dissimilarly, that archetype of musical communication, Mozart's *Symphony in G Minor*, is a single,

unified shape, although its dynamic power is sustained by recognising the parts that do not fit.

Section 2

Constructing Evolving Networks

Chapter 3

Connecting Points and Cutting *Atmosphères*: Dividing Unified Musical Space in Ligeti

The relationship between a work and its title is a fundamental aspect of musical communication, and this sheds a particularly interesting light on '*Atmosphères*'. Appropriately for such a deeply affecting and demonstrably well thought-out work, two common usages of this term concern emotion and science. In both senses the word refers to the *surroundings* of an object rather than an entity in its own right: an atmosphere is a physical or imagined space in which something might exist, or an event might occur. Conceptually then, there is no-'thing' here, merely the 'ground' in which existence is possible – the absence of musical substance. (It is easy to find one's head in the clouds talking about this piece.) Given that theoretically a network is a set of connections between points, themselves manifest as musical objects, clearly the piece presents a challenge to perception, begging the question of how two things might be linked when neither exists. In this context it is perfectly down-to-earth to consider the theoretical implications of how musical space and time is occupied, as defined by dimensions of pitch, timbre, amplitude and duration.

Such issues were clearly on Ligeti's mind around the time of *Atmosphères* (1961). A great deal of time during his early days in the West was spent discussing compositional aims and aesthetics in the Darmstadt avant garde (for a fuller discussion of the circumstances surrounding Ligeti's arrival in the West, see Steinitz, 2003: 72-7). In 1957, on fleeing his native Hungary, the composer stayed with Stockhausen for six weeks, whilst at the same time, a four-month scholarship allowed him to work in the Radio Südwestfunk studio in Cologne. One year later Stockhausen began to realise *Kontakte* there, during which time Ligeti's presence continued.

It was Gottfried Michael Koenig, however, who was most influential on the Hungarian. He learned a great deal from that 'mentor' and assisted in the realisation of his 'electronic *Essay* (1957-58), whose sonic fluidity so impressed him that he still regards it as the best example of the studio's montage work' (Steinitz, 2003: 75-8). Such fluidity is central to much of Ligeti's early mature output; and Koenig's influence is clearly apparent in the electronic piece *Glissandi* (1957), which, as Steinitz says,

... is significant for at least one reason. In this new medium, Ligeti could create for the first time an amorphous sound-flow, freed from metre and pulse, which would become the defining trait of his return to instrumental music. It was an important extension of his horizons.

(Steinitz, 2003: 79)

Within that return to instrumental composition *Atmosphères* is preceded only by *Apparitions* (1958-59), and owes a great deal to such electronic-music thinking. Flow of any kind denotes a lack of divisions and/or boundaries, and the material within this work seems, on first hearing, to resist containment. Rather, these are continuous, expansive atmospheres: in a very real sense, musical horizons are extended.

The studio is an ideal training ground for the composer of a work concerned with the absence of musical objects, since it offers the artist only raw sonic materials, rather than fully-formed motifs, themes and chords. Composers of electronic music may work with frequency rather than pitch, bandwidth rather than tessitura, timbre rather than instrumentation, transformation rather than development and so on. Considered thus, rather than being divided into bars and beats or octaves and semitones, dimensions of pitch, timbre and amplitude are continua which require organisation. Ligeti's time in Cologne clearly had a lasting significance on his musical conception and language, although he is notable amongst his contemporaries for having adopted an individual compositional stance. Where total serialism might be

cited as totally-imposed articulation of musical dimensions, his 'music is a continuous flow. unbroken ...' (Ligeti, 1983: 14). The absence of elements such as rhythm, harmony and melody creates a kind of musical void, and what is left is a slowly evolving 'textural composition' – a genre surely spearheaded by Ligeti. Thus, the titular connection is communicated with the utmost immediacy and clarity. Listeners are presented with an empty space, or atmosphere, devoid of any immediately recognisable content. With a view to considering what *is* in the piece as opposed to what is not, it is important to understand this notion of a 'content-free' piece in the sense that *Atmosphères* is 'liberated' from rhythmic, melodic and harmonic constraints, rather than in any way lacking in substance.

In more traditional works, those elements act as perceptual frameworks; they exist within imagined grids which divide or articulate musical time and space. Effectively, this provides listeners with a means of understanding how events are contained within those dimensions, hence 'closure'. To hear a rhythm, melody or harmony is to perceive a 'thing' – a unified musical entity consisting of connections within a group of sounds, occurring at positions along those axes of pitch and time. By implication, any musical object implies the remainder of the dimensions within which it is situated – the possibility of *other* things. Thus, there is scope for 'opposition': points that are connected differently are recognisably *not* the initial object. It is on this basis that networks evolve. In the course of a piece, unified objects are opposed (or related) to each other in different ways, and they thus assume distinctive significance within a growing context of oppositional relationships. By liberating his music from these grids, therefore, Ligeti suspends certain fundamentals, denying listeners their traditional means of perceiving the division of musical space and time. Michael Hicks points out that

... when constructing a musical form during this part of his career, he replaced tensions vs. resolution, dissonance vs. consonance, and other “pairs of opposition in traditional tonal music” with a concern for textural density.

(Hicks, 1993: 174; quotation from Ligeti, 1983: 60)

Arguably, *Atmosphères* goes beyond merely eradicating such dynamic couplings: it transforms the nature of opposition itself. In this way, Ligeti presents from the outset an entirely new perspective on the communication process.

Opening Sound(’s) Extreme: Everything at Once, or Nothing Forever?

The profoundly gentle impact of the opening of *Atmosphères* is difficult to describe in words, and resonates beyond its immediate context; it is surely one of the most important moments in twentieth-century music. Ultimately, any attempt to capture its essence in another medium is a huge compromise, and due to its uniqueness the initial sonority must be experienced rather than imagined. Ex. 3.1 is a colour-coded map of the pitches in the work in which red stars denote strings, blue woodwind, and yellow brass. The notation is reduced in Ex. 3.2.

Ex. 3.1: see fold-out sheet (p. 145)

Ex. 3.2:

MOLTO SOSTENUTO
♩ = 40 or slower

Flutes
pp dolcissimo *morendo*

Clarinets
pp dolcissimo
con sord. *dim...morendo*

Bassoons
(+ Contrabassoon)
pp dolcissimo *dim...morendo* *dim...morendo*

Horns 1, 3, 5
pp dolcissimo *dim...morendo*

Horns 2, 4, 6
pp dolcissimo *dim...morendo*

Strings
pp dolcissimo *dim...morendo*
con sord., sul tasto

Fifty-nine pitches are sustained for eight bars at ♩ = 40 or slower, at a dynamic of *pianissimo*. During the first 12 of these 48 seconds no change occurs; and for the remainder, there is a gradual diminuendo to *ppp*, some instruments fading out fully. It is no accident that time and space seem suspended, and accordingly it is apt to consider events in their various dimensions.

With regards to pitch, every semitone within a span of five octaves is sounded (with a single exception of the B one octave and a semitone below middle C). To all intents and purposes the sheer vastness of the sonority represents a total and even distribution of sounds within pitch space. Intervallic consistency on this scale has a

limiting effect on perception; where everything is the same, it is nigh-on impossible to discern any detail, less still any meaningful patterns. In such a saturated context it is hard to pick out any intervallic relationships. Testimony to the import of this for communication, it is difficult to know how to label the pitch content of this sonority. Certainly, 'chord' is inaccurate, since without a sense of intervals there can be no basis for hierarchy, less still functionality. Rather, every note has equal, and thus functionally unspecific, significance. In turn, this exposes the inadequacy of the term 'cluster', which implies concentration in a particular area of pitch space. The more Ligetian 'cloud' is wholly appropriate. Leaving aside such terminological niceties, what is important here is the perceptual result of this opening sound. Ex. 3.1 shows that as the woodwinds fade, gaps are left in the sonority. However, it is difficult to imagine that any listener would hear this as a change in *pitch content*, since the global effect of total saturation is sustained. Instead, the result is a subtle gradation of orchestral colour and dynamic, a slight change in the otherwise consistent overall sonority.

A similar effect is achieved in terms of orchestration. The cloud is scored in order to create as homogenous an overall timbre as possible. The use of mutes and *sul tasto* by the strings removes higher harmonics, those which serve to characterise the 'string' sound. The winds are also muted, to similar effect, their respective pitches dovetailed and placed in the central register so as to merge with the overall sound. The only brass instruments used are the horns, despite the presence of trumpets and trombones in the orchestra. Again, those timbres contain higher harmonics and are thus brighter, meaning that they would stand out within the overall sonority. Demonstrably, steps have been taken to ensure that instruments blend as closely as possible, creating a slowly transforming, single timbre, as opposed to the combination

of many. For orchestration just as for pitch, there is no sense of hierarchy, as again, listeners are denied a means of 'dividing' the material, given its consistency.

The opening of any musical (net)work is of extreme importance for its reception as a whole, since it presents the beginnings of an evolving context and thus conditions the understanding of later events. Therefore, the information it provides as to the manner in which time passes is crucial, since it informs the nature of how other parts of the piece are perceived: as interruptions, continuations, or as belonging to another unrelated continuity. Here, there is no articulation of the underlying 4/4 pulse, let alone any dynamic events around which to structure a recognition of change. Rather, the transformation which occurs is fluid; a gradual and slight *diminuendo*, resulting in a change in the colour of a single orchestral timbre. Since the surface is altered so minimally and slowly, it is impossible to perceive and consequently to understand the significance of each alteration. Thus, as is the case for pitch and timbre, the temporal dimension is presented as almost entirely consistent: paradoxically, so continuously fluid as to be static.

In this sound mass, parameters of pitch content, dynamic, and animation are all in one or other of their utmost states. Listeners experience extreme quiet, almost absolute stasis and, to all intents and purposes, the total saturation of pitch space. Aside from vastness, the most defining trait is the lack of characteristics. Nothing stands out as more significant than any other within any single dimension, and in turn, no particular dimension seems to dominate. Therefore, in terms of the overall effect, listeners are simultaneously saturated with information and offered no basis for distinguishing between sounds. The implication seems to be that they are presented with the entirety of musical space in a single instant and given no means to

differentiate between any of its parts. Given the marked lack of change through time, then, faced with everything at once, listeners experience nothing forever.

Again, the discussion verges on total poetic abstraction. Just as the music itself evolves from seeming stasis, so must this investigation of *Atmosphères*. With a view to moving on, and in keeping with the listening process, it is valuable to consider how this opening gesture conditions the rest of the work. In essence it presents musical space as wholly unified: it is perceptually difficult to divide or parse the information it provides, either horizontally or vertically. Thus, since perceiving the difference between sounds underlies any musical dialectic, this represents a fresh perspective on communication, which surely contributes to its ethereal quality. The work proceeds as a single, transforming state, at different times occupying different positions within various fluid scales of intensity. The impact of this opening sonority is such that it affects the perception as well as the reception of the remainder, and much of the discussion below arises on account of the communicative framework established in these first few bars.

Having considered the implications of the opening sonority, it is important to examine those of *Atmosphères* as a whole. Broadly speaking, the piece is constructed out of immense 'blocks' of sound and smaller, more-concentrated 'threads' (see Ex. 3.1). Accordingly, the listening perspective constantly oscillates between zoomed-out generics and focused specifics. The potential implications of those two states of affairs for perception are considered below, starting with those of the immense sonorities.

Immensity and Imprecision: Merging in Dimensions-merging-in

In the 'huge' sounds in bars 1-8, 13-22, 44-8, and 66-72 (see Ex. 3.1), the discernment of specific intervals and instrumental sonorities is limited by saturation, so that, perceptually, cutting *Atmosphères* can be difficult. Because musical space is occupied so fully and consistently, by implication its articulation is hidden. Elements such as pitch, rhythm and orchestration are disposed quite differently than in more conventional music, bringing into question their qualification as dimensions – as separate 'measures' of sound. (Of course, it is possible to listen for particular intervals or instruments and to hear them, although to do so is to project a model onto the musical surface which is not inherent to it.) The challenge to differentiation during these vast passages invites a kind of 'imprecise' or relative hearing, one which informs the reception of the whole. Since limits are imposed on the level of detail which might be perceived, more-general characteristics and behaviours of the material are elevated in perception.

The subversion of distinction within pitch and timbre implies a limit on the extent to which degrees in those dimensions can perform structural functions. For example, given the lack of octave equivalence, division into semitones serves a regulatory purpose, ensuring consistency within pitch space and avoiding any hierarchy. Notionally, therefore, things merge in perception, as divisions are insignificant. Rather than gradated axes, pitch and timbre function as continuous spectra, or spectral continua. In the absence of perceptual coordinates, there are three features of continua, each representing a sensitivity to which listeners must attune themselves in order to understand how a single object might exist within it:

- the extremities
- the amount of 'space' populated at a given point, and the manner in which it is populated
- movement within it.

Certain of these sensitivities might come to the foreground at different times, depending on the characteristics of the material within a particular dimension. At some times, pitch movement might predominate, whilst at others a rapid and/or vast increase in loudness might highlight the extreme position of events in terms of amplitude, and so on. Effectively, the dimensions provide *perspectives* on the behaviour of the material at any given point. They act as inherent characteristics of the overall sound which are continually reprioritised. Considering the work in its entirety, just as for *Kontakte*, the dimensions (time) are in the object, rather than the object being located in dimensions (time). Yet, since the listening process exists in time, music cannot be experienced as a simultaneous whole. Although perhaps in this piece less than in any other, there remains an inevitable tension between content and form. Effectively, that friction is lessened here, since 'merging' occurs on two levels. There are points at which behaviour within a particular dimension is prevalent (albeit positions within it are indistinct), and there are others in which no single continuum prevails. Thus, as well as merging-in-dimensions, listeners can also hear dimensions-merging-in.

Immensity and imprecision I: 'registering' pitch as a spectral continuum

It is easy to understand how sensitivities to the extremities and the amount of space populated within the continuum are manifest in terms of pitch. Perceptual imprecision in this dimension has the effect that listeners are afforded the opportunity to experience *register*, rather than clearly defined pitch levels. Sounds are heard in relation to two extremes - as relatively high, low, or somewhere in between.

Similarly, the amount of space populated within the continuum translates into *tessitura*. This aspect of the material takes on heightened importance at various points, and indeed, it is the defining difference between these vast sections and other, 'smaller' ones. Listener sensitivity to movement in this dimension has rather more subtle implications, however.

The impression of pitch motion is an illusion, brought about by changes in pitch-content. To hear a melodic line is to perceive pitches occurring at different points in time as connected, as parts of a single, horizontal stream of information with inherent mobility. Momentarily turning away from *Atmosphères*, this occurs clearly at the opening of the second movement of Mozart's *Symphony in G Minor*, K. 550, as shown in Ex. 3.3. That passage is chosen for discussion here on account of the consistency of timbre, dynamic and rhythm; just as for the example of Ligetian micropolyphony discussed further below, pitch is the only aspect which changes.

Ex. 3.3:

Andante

Horn in Eb

Violin I

Violin II

Viola

Violoncello e Contrabasso

p

There is sufficient proximity for the parts to be recognised as combining to form a single polyphonic whole, rather than as separate objects. Within it, changes of pitch elevate different lines to prominence at different times, set in this instance against stasis in the others. For example, the chromaticism in the 'celli and basses stands out from the rest of the texture in the second full bar, as does the diatonic movement of the violas in the third bar, and so on. In more complex textures, this effect arises on account of the different speeds at which the contrapuntal lines move: because, at given points, some parts are faster than others, they take on added relative significance.

The idea that certain lines stand out at different times implies the notion of a perceptual foreground, occupied by the various lines as they come to prominence, and a background texture into which they recede. Thus, pitch movement might be perceived as occurring within those two contexts. Importantly however, there is a further-back ground here. The pitches are heard in terms of the extent to which they conform to, and their position within an E^b major-octave; they are figures to that ground (which in itself might be thought of as a figure to the ground of the chromatic scale). Of course, at no point is the entire E^b -major scale heard simultaneously. Instead, it acts as an imagined perceptual framework which gives the pitches their relative melodic and harmonic significance, and thus characterises them as having-resolved, or not. Thus, they take on temporal implications (of the necessity for continuation) as they move through pitch space.

By contrast, in the vast sound masses of *Atmosphères*, the background against which pitch is heard is to all intents and purposes fully realised and, in addition, saturated. Further, for much of the work, instruments simply sustain or repeat pitches: as shown in Ex. 3.1, the pitch content remains constant in most of the large blocks of

sound. Theoretically, this ought to negate any percept of foreground and background, since it implies an absence of any difference in the rates at which the parts change. There are two passages in which the illusion of movement within the pitch domain is brought about, however.

For the most part, the saturated musical surface denies the listeners a means of perceiving intervallic relationships. However, between bars 16 and 20, chord-like formations are clearly audible. A reduction of the aural effect is shown below.

Ex. 3.4:

The image displays a musical score for Ligeti's work, starting at Bar 16. The score is organized into several systems of staves:

- Horn Section:** Six staves labeled Horn 1 through Horn 6. Each staff begins with a dynamic marking of *ppp*. The notation includes various dynamics such as *dim.*, *morendo*, *pppp*, *f*, and *ff*. There are also markings for *pppp* and *pppp* with a *morendo* instruction.
- Trumpet Section:** Four staves labeled Trumpet 1 through Trumpet 4. Each staff begins with a dynamic marking of *ppp* and includes the instruction "con sord. (cartone)". Dynamics include *dim.*, *morendo*, *pppp*, *cresc.*, *f*, and *dim.*.
- Trombone Section:** Four staves labeled Trombone 1 through Trombone 4. Each staff begins with a dynamic marking of *ppp* and includes the instruction "con sord. (cartone)". Dynamics include *morendo*, *pppp*, *pochiss cresc.*, *ppp*, *dim.*, *morendo*, *pppp*, *cresc.*, *f*, and *dim.*.
- Aural Effect:** A single staff at the bottom, labeled "Aural Effect". It starts with a dynamic marking of *ppp* and shows a progression of dynamics: *f*, *ppp*, and *ff*.

The score uses various musical notations including slurs, accents, and dynamic hairpins to indicate the intended performance. The overall texture is dense and complex, characteristic of Ligeti's style.

Effectively, the orchestra acts as a single resonating chamber for the *crescendi* in the brass; the strings and woodwind (not shown above) double their pitches and dynamic markings at various octaves, amplifying the alternation between the (piano) white- and black-note formations. In spite of the fact that in reality the pitch content does not change, a semitonal shift is perceptible through changes of dynamic which, in turn, bring about variance in the composite timbre. Thus, in bringing about the effect of pitch movement those dimensions are synthesised; pitch, amplitude and timbre are merged.

The passage in bars 44-55 is an iconic example of contrapuntal technique within twentieth-century music, an early example of micropolyphony, a trademark of Ligeti's compositional style. For this double canon, the string section is divided into two higher and lower forces. The violinists I and II all play the same melodic line, each following their own rhythm, whilst the violists and 'cellists all play a different one, also heterophonically. Thus, there are 48 independent lines in the canon – far too many to be heard as counterpoint. Instead, the perceptual result is textural. Similarly, there are more parts than can be shown in a single example on A4 paper. For presentational reasons, Ex. 3.5a shows a sample of the composite texture (the 14 violin I parts in bars 45-7), and Ex. 3.5b shows the pitch contours of the two canonic lines.

Ex. 3.5a:

Ex. 3.5b:

NB: these first two pitches are beyond the range of a viola.
Accordingly, those instruments start 'out of phase' with the
pattern, at '*', playing the pitches following that point an
octave lower than notated here, and those preceding it an
octave higher. The result remains a continuous line.

Importantly, these patterns of alternate whole-tone and semitone movements do not recur at the octave. In terms of perceptual effect, this denies a means of discerning patterns or groups in terms of both pitch (octave equivalence) and phrasing (melodic recurrence). Micropolyphony embodies in melody a typically Ligetian paradox, one which recurs throughout *Atmosphères* in various forms. Although there is melody everywhere, none can actually be heard. Compositional decisions have clearly been taken to maximise timbral consistency, as in the use of only the strings (with double basses entering the canon only in their less-resonant high register, surrounding middle C) and rhythmic and chromatic saturation (as soon as one

instrument has quit its note, another assumes the same pitch). Ex. 3.1 shows that a near four-octave span is sounded almost continuously from one bar to the next, the only gaps arising between the two orchestral forces, rather than within either of them. These factors lead to a perception of generic imprecision, rather than specific detail, just as for the opening sonority. However, listening to this passage is a qualitatively different experience from the opening, since pitch movement, or change in each part, implies that there *is* a foreground here; earlier, the lack of events offered listeners the means to hear only from a 'zoomed-out', background perspective. In turn, this implies a peculiar relationship between foreground and background. They are only identifiable by their general characteristics; this blurs the relation between the two.

It is easy enough to understand the inner workings of micropolyphony and how it limits listeners' perceptual sensitivities, although somewhat more challenging to consider its positive effects: what and how it actually enables in perception, and the attendant implications. Ex. 3.1 shows that there are three phases of activity. In the first (from bar 44), listeners are presented with a huge web of sound as the canon enters. Although pitch movement can clearly be discerned in the foreground, it has no significant effect on the background sonority, which remains static. As such, pitch and timbre are merged: melodic movement brings about a textural effect, rather than a change of position in the pitch continuum.

The second phase arises around bar 46, as it becomes clear that that web is composed of two swathes of sound, with the two voices of the canon moving in contrary motion. Thus, as they move towards each other, listeners experience direction within pitch movement, both upwards and downwards. However, the background sonority remains static. Although there is a gap between the two voices of the canon, it is essentially imperceptible, as the overall pitch content is still saturated.

In the third phase, the violins and lower strings converge (c. bar 51), as the background sonority changes. Interestingly, as shown in Ex. 3.1, this *movement* is in fact a change in *tessitura*, meaning that two seemingly distinct behaviours in the pitch continuum are made to merge. This has a further effect, as pitch merges with dynamics. At the end of bar 51 a crescendo is marked, implying movement in the dimension of amplitude. Obviously, this results in an increase in volume: however, in reality it serves to maximise a feature already inherent to the material. In contrast with the start of the passage, where forty-four pitches were sounded at a dynamic of *pppp*, by bar 51, even without the crescendo marking, the volume of sound is concentrated to just nine. Accordingly, what starts as change in the pitch continuum causes the intensity of the overall sonority to increase as that dimension merges with amplitude and timbre. It would seem, then, that *Atmosphères* is a clear illustration of how change in one parameter necessarily brings about change in others.

Immensity and imprecision II: timbre as a continual spectrum

Timbre is rather more difficult to grasp as a continuum than pitch, since there is no pre-existent concept of timbral precision. Also, it is multi-dimensional. Even in the absence of octave equivalence, pitches are heard as high or low, while there is no such single opposition against which different timbres might be recognised. The division of the octave into twelve semitones is negated through saturation, bringing about more approximate perception of register, rather than clearly defined patterns in pitch. Insofar as parallels might be drawn, the timbral equivalent is the negation of orchestration, and *Atmosphères* represents a fresh approach, in keeping with its electronic-music conception. Historically, certain instruments have taken on a particular cultural or musical significance. For example, for centuries the flute has

represented dramatic characters, evoked emotive moods such as seductiveness, and indeed merely mimicked birdsong. Affecting though these atmospheres are, no such references are used in this example of high modernism. Arguably, just as this work is liberated from rhythmic, melodic and harmonic constraints, so also it transcends this orchestrational context. Ultimately, rather than orchestration, listeners hear timbre.

For studio composers, technology offers potentially infinite variety in this domain, meaning that their raw materials are chosen from an unconstrained range of timbre(s). This is different from orchestral composition, in which, traditionally, composers work with distinct sonorities: separate instrumental sounds offer an in-built constraint, acting as gradations in the orchestral palette. In *Atmosphères*, Ligeti strikes a middle ground, treating the orchestra as an unarticulated spectrum. The overriding blend of the opening sonority prevents different timbres from being distinct, let alone identifiable as flutes, clarinets or horns. Instead, the first sound is that of an entire, indivisible orchestra.

That initial lack of hierarchy is sustained almost throughout. Only at a few points are multiple timbres used in such a way that they do not merge imperceptibly into the composite sound. Rather than performing functional roles as separate parts of a texture, the various sections of the ensemble offer particular shades within the overall colour. Symptomatic of this subtle difference of approach, much of the time players are instructed to inflect their tone quality: *sul tasto*, *con sordino* and *sul ponticello* markings proliferate in the strings, and specific mutes are required for use by the brass. As an example, rather than hearing a specifically *flute*-entry at bar 83 (see Ex. 3.6), in the context of brief, uncharacteristic string oscillations it is as though the timbral aspect of the high-register sound happens to be the colour of flute harmonics.

Ex. 3.6:

The score is divided into systems for Flute (Fl.), Violins I (VI. I.), Violins II (VI. II.), Viola (Vla.), Violoncello (Vc.), and Contrabass (Cb.).

- Flute (Fl.):** Features a 3/4 time signature and a 2/4 time signature with a right-hand arm (R) marking. A boxed 'S' is present at the end of the section.
- Violins I (VI. I.):** Includes markings for 'ord.', 's. tasto', and 'arco s. pont.' with dynamic markings $\leq P$, PP , and PPP .
- Violins II (VI. II.):** Includes markings for 'arco ord.', 's. pont.', and 's. tasto' with dynamic markings $\leq P$ and PPP .
- Viola (Vla.):** Includes markings for 'arco, s. pont. → tutto s. pont.²⁾' and 's. tasto' with dynamic markings PPP , f , mf , and PPP .
- Violoncello (Vc.):** Includes markings for 'arco s. pont.', 'c. legno', 'arco s. tasto', 'ord.', 's. pont.', and 'tutto s. pont.³⁾' with dynamic markings PPP , $PPP < mp$, $PP > PPP$, and $PPP < mp$.
- Contrabass (Cb.):** Includes markings for 'con sord.', 's. tasto', 'c. legno', and 'arco s. pont.' with dynamic markings PPP , $P > PP$, and $PPP < mp$.

¹⁾ unmerklich absetzen / imperceptible attack
²⁾ genu ohne Haare / entirely without the hair of the bow
³⁾ genu am Saug (fast ohne Ton) / entirely sul ponticello (almost without tone)

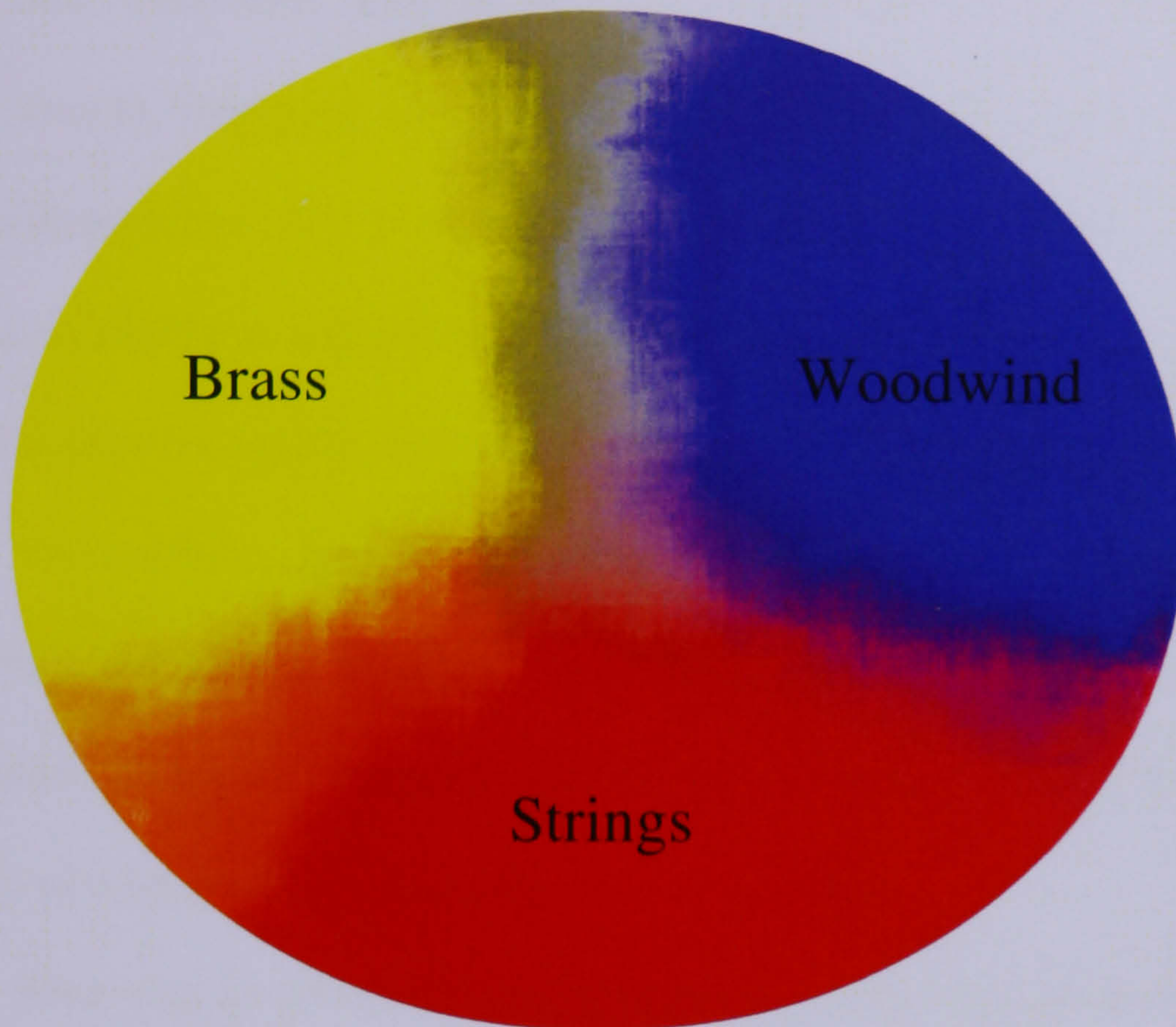
Timbres are divorced from their instrumental identity here: just as specificity within pitch is imperceptible, so perceptual imprecision is deliberately brought about in timbre.

The idea of the ensemble as a continuous timbral spectrum has a number of implications. In particular, it is distinct from the idea of pitch as a spectral continuum. The difference between two pitches is one of degree: the chromatic is literally a scale, with its extremes of high and low. For timbre, the matter is rather more complex, since the basis for difference is one of kind. Sounds might be 'dark' or 'bright', dense or sparse, blended or divided, 'warm' or 'cold', although such labels are far more context-dependent. There is no absolute opposite of 'clarinet'. The vast scope for timbral variety and subtlety suggests a rather different model for this aspect of the material than for pitch; and inevitably, the one proposed below is a gross simplification. However, it prompts certain insights as to how the extremities, the amount of 'space' populated, and movement within this dimension might be manifest, and it serves to illustrate the complexities involved.

The extremities of any continuum provide outer limits against which objects might be situated. Timbrally this presents a problem, as the positions occupied by the material can be defined only with reference to those timbres that are perceived during the work (as opposed to the infinity of others that are not). Thus, a timbral dynamic arises out of changes in the overall sound between the beginning and the end. Paradoxically, the first timbre in *Atmosphères* is distinctive on account of its indistinctness: strings, woodwind and brass are blended consistently. By implication, therefore, any change in the balance makes the sonority more distinct, constituting a move towards one of three extremes, pure strings, woodwind, or brass. Conceptually, the starting position is in the centre, a maximum blend. As the work continues, and

different aspects of that opening sonority are 'teased out', the material occupies different positions within a *radial* plane, rather than a one-dimensional opposition, as illustrated in Ex. 3.7.

Ex. 3.7:



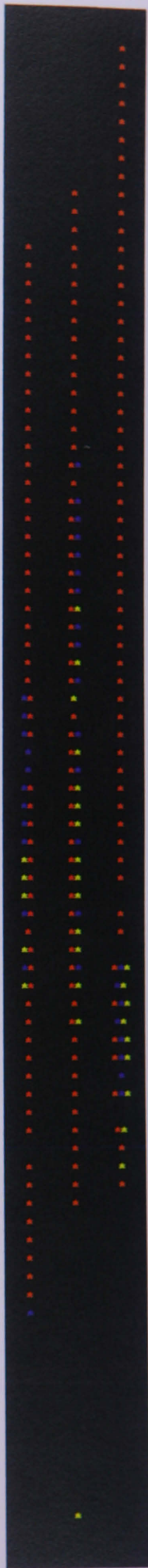
This model has many shortcomings. For instance, it is overly simplistic to consider a tri-partite division between woodwind, brass and strings, when those three families each produce a number of timbres, each of which are subtly inflected. Further, it does not account for the brushing of piano strings, or the non-pitched blowing through the brass instruments in bars 75-77. However, it does provide a starting point for discussion of how this textural composition functions as a whole; if there is a unifying factor to these nine minutes, surely timbre lies at its heart.

The multi-dimensionality of timbre has implications for the perception of time, since at any given point it offers a number of possibilities for how the sound might be transformed as opposed to just one. In oppositional dimensions such as pitch

or amplitude, once the material has reached its maximum intensity, there is only one option for continuation (and of course, one for discontinuation). For example, having reached the extreme high register, discounting events in other dimensions, either the music can cease in that register or move to a lower one. Therefore there is, to some extent, an inevitability attached to future events, implying an attendant sense of temporal consequence, or at least subsequence. For a change of timbre, however, there is a range of options available at any point. Philosophically speaking, then, on account of its multi-dimensionality, timbre does not have the inherent capacity to bring about inevitability. Any temporal momentum which it generates is of a different kind to that in other continua, in that it is less directed. Even at maximum points of intensity, timbre cannot bring about causation of a specific change, only the necessity for one to occur.

One way in which timbral activity might be associated with temporal momentum is through repetition. Should a particular timbre recur as part of a ritual pattern, for example, it might play upon listeners' expectations, and thus take on a kind of timbral and temporal gravity. However, in such a case, it would be the fact of recurrence, rather than the fact of timbre, which fashioned listeners' perceptions of time. Although there is no actual repetition in *Atmosphères*, arguably, to some extent, 'recurrence' of the opening sonority can be experienced. Ex. 3.8 shows snapshots of Ex. 3.1 at bars 1, 13 and 66.

Ex. 3.8: see margin



As the graphic shows, they are quite dissimilar, as the third sonority extends nearly an octave over the first. Besides tessitura, there are more-definitive timbral differences. Bar 13 is somewhat brighter and more 'open' than bar 1 on account of the larger range and broader spacing of the wind and brass: the strings play harmonics in the third sonority, giving it an altogether different quality (perhaps 'hollowness'). Of course, in a performance, these sonorities are not heard adjacently, and listeners' perceptions of them are conditioned by what happens in between. Relative to those intervening events, these three sounds are strikingly similar, most obviously in terms of their immense tessiturae, although also in their orchestration. In each, the winds and brass are placed within the range of strings (with the exception of the contrabassoon, b.1, and the tuba, b.13 – another similarity). Accordingly, there seems to be an implication of a return of generic aspects, as opposed to specific features, of the opening cloud.

Immensity and imprecision III: the relative impact of change

In the vast blocks of sound, the musical surface is altered subtly enough that it is impossible to perceive the effects of changes within separate instrumental parts. Although in combination they bring about gradual transformation in the background sonority, each individual event is insignificant relative to the overall sound. By implication, cause and effect are divorced, and this plays a large part in creating the other-worldly atmosphere of the work; literally, its inner workings are beyond perception. Symptomatic of this is an implied parity between event and non-event from the outset. That the very first marking in the score is an extended and slight *diminuendo* is illustrative of an elevation in the dynamic value of 'offs' and a concurrent reduction in that of 'ons': instruments make as much of an impact by

stopping playing as they do by starting. By weakening the potency of specific events, the huge blocks of sound in *Atmosphères* deny listeners any markers in musical time or space around which to structure their recognition of change.

An effect of the absence of perceptual orientation-points is to allow listeners to recognise that something is shifting, although they might not realise what it is; they experience the process of transformation, rather than a clearly recognisable result. Were the diagram below a representation of perception in one of these 'immense' parts of the work, listeners would experience the qualities of the arrows rather than understanding the significance of the letters relative to one another:

$$a \rightarrow a \rightarrow a$$

$$\downarrow$$

$$A \leftarrow a \leftarrow a$$

Following this metaphor through, it is not always immediately clear which is the predominant characteristic of the arrow. Listeners cannot always perceive which particular intensity increases/decreases in the huge sound masses, because of perceptual merging both within and between dimensions. However, there are other passages in which the sound quality undergoing change is clearly audible, as listeners are not saturated with information. As Ex. 3.1 shows, the vast sonorities discussed above are linked together by smaller threads of sound that bring about a markedly different listening experience in which, arguably, it is often impossible not to recognise the principal basis for change, as explained below.

Less Sound = More Information: Perceptual Precision at Focal Points

A brief glance at Ex. 3.1 shows that an essential measure of the various parts of the form is, simply, the number of stars shown at given points. Sometimes many instruments play simultaneously; elsewhere, very few. Such literal note-counting might seem simplistic, even crude, as a way of rationalising the score; a great deal of the piece is not represented in the diagram (or for that matter, the score). Nonetheless, considering the number of sounds heard simultaneously is important in understanding the formal dynamic and the ongoing listening experience. The passage in bars 55-6 is starkly contrasted with the opening, since by the end of it a single interval is sounded.

Ex. 3.9:

Bar 55

The musical score for Ex. 3.9, Bar 55, is presented in a standard orchestral format. It consists of ten staves, each representing a different instrument: Flute (Fls.), Bassoon (Bsns.), Horn (Hns.), Trumpet (Tpts.), Trombone (Tbns.), Violin I (Vln I), Violin II (Vln II), Viola (Vla.), Violoncello (Vc.), and Contrabass (Cb.). The score is divided into two measures. The first measure is highly active, with multiple instruments playing complex rhythmic patterns, including triplets and quintuplets. The second measure shows a significant reduction in activity, with many instruments playing sustained notes or rests, illustrating the concept of 'less sound = more information'.

(NB All pitches sound as notated in this example: Cb part written an octave higher in the score. Dynamic markings are not included for clarity, although each individual note is marked *pppp*, that crescendo ending *mp* or softer.)

That only two pitches are heard at this point is highly significant, as it implies that at the very centre of the work (the 55th-56th of 110 bars) its basic units are exposed: in the case of pitch, a single semitone; in timbre, particular sonorities are heard as and within categories of strings, woodwind and brass. Small-scale temporal relationships are also presented. Although they hardly form an easily tap-able rhythm, events can be recognised as happening within the same, local timeframe. Detail is perceivable within dimensions of pitch, timbre, and time; listeners can hear interval, orchestration and 'rhythm' here in a way which they could not at the start of the work.

Effectively, this implies a drastic difference in listening perspective between the events at bars 1 and 55. At the opening, a perceptually indivisible sound mass inheres a 'zoomed-out' viewpoint from which only general features such as its vastness might be discerned. Here, at the centre of the work, local patterns are apparent in a 'smaller' composite sound, implying a more specific, focused perspective. This is brought about because of the differing 'rates' at which listeners are required mentally to process the music at those points. Ex. 3.1 shows that the opening sonority imparts information at 59 sounds per instant, too high a rate for any of that 'data' to be distinctive. In contrast, presented with just two sounds at a time in bar 55, internal relationships and their effects on the overall sonority can be perceived. Thus, in terms of perceptual effect, the difference between zoomed-out and focussed perspectives is that from the latter, listeners are able to recognise the whole as the sum of its parts. In the 'smaller' parts of the work they can perceive both change itself and its influence on the whole, its significance.

Points of maximum difference

The idea that the impact of change is heard in proportion to the total sound as and when it occurs is central to *Atmosphères*. In the immense sound masses, the relative insignificance of each instrumental part means that the overall result is an indivisible, evolving sonic state, rather than a succession of discrete events. However, there are three points at which the change from one moment to the next is so intense that the overall sound is radically disconnected. These are shown below (see Ex. 3.10).

Ex. 3.10:

Bar 39

Piccs. *ffff*

senza sord.,
tutta la forza, ten.

Cb. *ffff*

Bar 53

Fls., Cls.,
Hn. 3 *pppp*

Full Strings *cresc..... ffff*

Strings: stop suddenly

(NB: This rhythmic notation represents saturation rather than an accurate reduction of the agglomerate of every individual part.)

Bar 59

Fls., Cls.,
Bsns., Hns. *pppp < f* *morendo*

con sord. (metallo) (+ Hns)
3 (+ Tbns)

Tpts
(+Hns., Tbns.) *pppp* *ffff (possibile)*

arco, sul pont.

Vln II, Vla, Vc. *pppp* *mp*

(NB dynamic markings are reduced here: as new clusters of pitches enter, they are invariably marked *pppp* <, that crescendo leading to a dynamic of *ff* or louder, after which each attack is marked *ffff ten.*)

At each of these points, there is an extreme change in one particular dimension which demands attention: at bar 40. pitch; at bar 53, dynamic; and at bar 60. timbre. However, in each instance, there are implications for the behaviour of the material in secondary dimensions, as shown in the table below.

Ex. 3.11:

	Pitch	Amplitude	Timbre	Primary dimension
Bar 40	Drastic change	Stasis	Drastic change	Pitch
Bar 53	Stasis	Drastic change	Drastic change	Amplitude
Bars 59/60	Slight change	Fluctuating dynamic	Drastic change	Timbre

In all three cases there is a complete switch in the family of instruments used: effectively, in bar 40 the timbral change is equally as drastic as that of pitch, a complete change of colour, although the pitch activity overrides this. Similarly, the contrast in dynamic overrides that of timbre in bar 53. Arguably, in those two instances, the primacy of the dimension in which the principal change occurs arises on account of that change happening in an oppositional continuum. Since the notion of opposite extremes exists in pitch and amplitude, when they are realised, they demand the listeners' attention over and above other characteristics. Where pitch is the subject of change, amplitude remains consistent so as not to detract attention from the primary contrast. Thus, the nature of change itself is carefully managed.

The sudden nature of each of these changes is in stark contrast to the opening. Where in bar 1 perceptual division was well nigh impossible, at these points it is impossible not to divide the material. Therefore, in *Atmosphères*, just as intensity increases within dimensions of pitch, timbre and amplitude, so it does in terms of change itself.

Time for Change

In a way, *Atmosphères* is a study in change. Sometimes change takes the form of dynamic events, but for the most part its perceptual status is lowered to gradual transformation. This has temporal implications, as, essentially, change is the articulation or unfolding of difference through time (or, conversely, the unfolding of time through difference). A transformation is a developing difference *in* a thing, as opposed to a change *of* thing. This implies a continuity of sonority, with an increase or decrease in the intensity of certain of its aspects. Should that continuity be broken, temporal division can be perceived. Similarly, too sudden an increase or decrease in intensity also marks a point in time, as a sufficiently rapid alteration leads to perception of separate events rather than a single flow.

Importantly then, as well as the *extent* to which alterations impact on the composite sonority, another crucial difference between transformation and change concerns the *rate* of fluctuation in intensity. At the points of maximum difference, that rate is so high as to be immediate, resulting in dramatic contrast, whilst for most of the work it is lower, giving rise to steady evolution. Effectively, change itself occupies different positions along continua of rate and extent. This places a particular requirement on the overall temporal framework. In more conventional structures, the coincidence of particular events with structural points elevates their importance. However, in the absence of inherent temporal markers, the form of *Atmosphères* must contain development of intensities, in terms of both their rate and their extent.

Arch form I: 'recurrent' materials

Ligeti writes at the front of the score that 'the overall form of the piece is to be realized as a single, wide-spanning arch – the individual sections melting together and subordinate to the great arch'. An arch resonates with any work concerning transformation, since essentially it is an unbroken contour. It comprises an ongoing difference in a single line of development, rather than changing relationships between separate entities. Fundamentally, the shape implies a smooth transition from an initial point of rest towards an apex (a point or region of greater intensity), followed by an uninterrupted move back towards the starting position. There is thus an implication of recurrence. Although no material is actually repeated note-for-note in *Atmosphères*, following the return in bar 66 of a cloud-like sonority similar to the opening, the generic characteristics of two other earlier events also reappear.

Firstly, the passage between bars 79 and 84 bears a clear relation to the tremolo figures in bars 23-29. In both cases, instruments alternate between two notes forming intervals of either a tone or a minor third, as shown below. (Again, the confines of A4 paper are too small for the entire score to be shown. Ex. 3.12 shows the parts for Violins II and Violas in bars 24-27; Ex. 3.13 shows the Violin I and II and Viola parts in bars 78-80. Despite the clear intervallic relationship, perception of that aspect of the material is subverted in both instances, in the first case because of the saturation of pitch space, and in the second due to the brevity of each individual entry. Instead, the most clearly recognisable common feature of these passages is textural; it is a 'shimmering' sonic state which returns in bar 79, although in a fragmented, less fully-embodied form.

Ex. 3.12:

VI II



poco a poco s. tasto

Vle



poco a poco s. tasto

Ex. 3.13:

VII



gettato (senza sord.) s. tasto ord. s. tasto

PPP

con sord. s. pont s. tasto

VI II



gettato (senza sord.) s. tasto ord.

PPP

con sord. s. tasto c. legno⁴¹

Vle



(senza sord.) s. tasto c. legno⁴¹

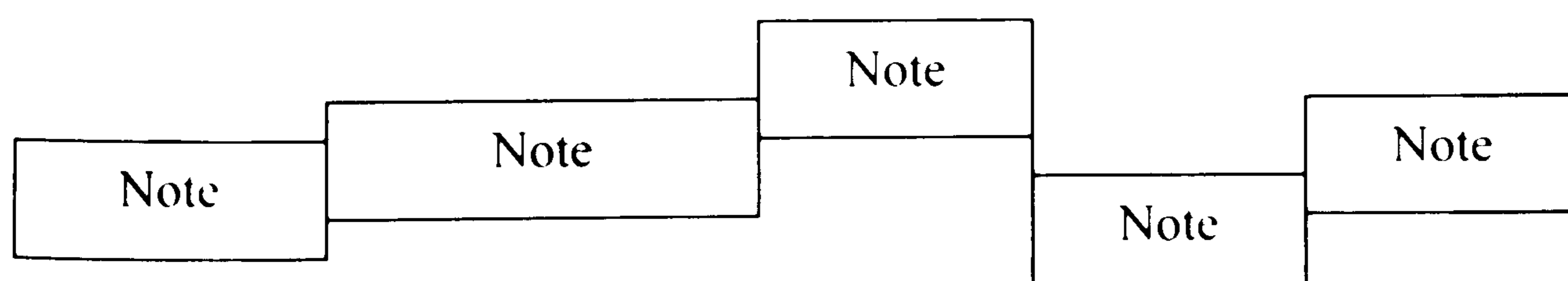
PPP **PP**

Following this, the dramatic seven-octave plunge which traverses bars 39 and 40 is echoed at bar 83, as the flutes sustain high harmonics, followed by pedal notes in the trombones and tuba at bar 98 (see Ex. 3.1). Spanning only four octaves, this second drop in pitch is far less intense than the first; despite a slight gradient in the flute parts there is no marked ascent in pitch, the woodwind and brass sonorities are separated in time, and the opposition between high and low registers is heard in the context of a 'veil of sound' (so named by the composer in his 'Remarks concerning rehearsal' at the front of the score), a background texture of interwoven string harmonic glissandi. Although generically the same changes occur in the second half as at the start of the work, on recurrence they are softened: contrasts are presented far less boldly. Thus, the nature of change itself does indeed change in the course of the form, since essentially the same transformations happen, although with far less drastic specific characteristics.

Arch form II: lower and higher arches

In saying that 'the individual sections...subordinate to the great arch', Ligeti implies both the existence and interaction of structural levels. Before discussing larger-scale issues, it is worth noting that arches are inherent to the material at lower levels. In more conventional music, where time is articulated by discrete events, low-level gestural contour might be expressed as below:

Ex. 3.14:



Divisions are clearly defined as each note is different from the others on account of its vertical position and length, and because each note starts and ends at a clearly recognisable point in time. This inheres a certain distance in terms of listening perspective, such that on account of the distinct identities of events, listeners can focus their attention on the relationships between them and group them accordingly. For *Atmosphères*, however, the first 'Remark concerning rehearsal' states that 'All entrances [are] to be played imperceptibly and *dolcissimo*', and *morendo* markings proliferate. Thus, the beginning and end of each note is disguised, and the basic gestural shape is:

Ex. 3.15:



This inheres a 'closer' perspective, inviting focal attention on the internal qualities of sounds and on patterns of expansion and deflation within each arch-shaped note. Analytically, this demonstrates how the large-scale shape exists at lower levels, although given that individual notes can very rarely be heard in *Atmosphères*, it says nothing of how the listeners' perception relates to the composer's conception. Observance of that requires discussion of events occurring over longer periods.

Arch form III: things in proportion

It is clear that this piece embodies a number of paradoxes, as listeners are presented with events which they cannot actually perceive. A common feature is that the perception of small-scale detail is obstructed and replaced by that of trends in the larger-scale background; chromatic saturation prevents perception of intervals, just as micropolyphony prevents melody from coming to the foreground. Perhaps unsurprisingly, the same applies to the form.

The formal characteristics of *Atmosphères* operate on two levels, internal structure and audible form. The internal structure does not come through, you cannot actually hear it. Both overall form and smaller formal units are divided so as to conform to a certain proportion; I adhered to this proportion down to the smallest formal elements. All this was the manifestation of the constructionist phase I went through in Cologne. It was typical of me that I gave the exact duration of each formal section in seconds and then wrote on the first page of the score that both duration and metronome markings are simply approximate indications. That is what I find the ideal solution, to state the proportions but not to insist on strict observance of them. Since *Atmosphères* I have never worked out proportions with great precision.

(Ligeti, 1983: 41-2)

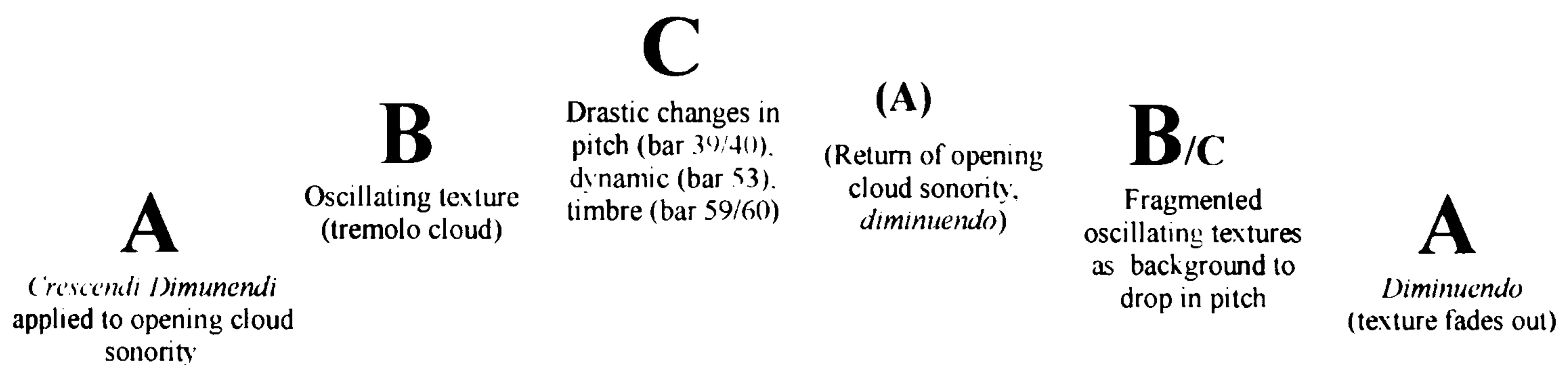
In keeping with Ligeti's simultaneously strict and relaxed attitude, the purpose here is not to find the particular ratio from which the work was generated but to try to find out how, in accordance with a proportional scheme, the distribution of events might play a role in communication – in short, how it might impact upon the perceptual grouping of musical information into larger-scale patterns of significance. The table below charts the successive states/events in the form which constitute significant occurrences due to their substantial impact upon perception. Durations in seconds are taken in accordance with strict adherence to the tempo markings. The bands of grey denote the alternating entries of the vast sound masses in which particular behaviours of the material are sustained.

Ex. 3.16:

Arch Form	Time (m:s)	State/Event	Overall effect of transformation/change	Duration in seconds	Tempo	
A	0:00	Opening cloud	Slight <i>diminuendo</i>	48	♩ = 40	
	0:48	'Cellos and violas	Pairs of semitones: <i>crescendi</i>	29		2'12"
	1:17	Second cloud	Groups of <i>crescendi</i> give rise to 'chord progression'	55		
B	2:12	Tremolo cloud begins	Textural oscillations in strings, <i>accel.</i>	16.5	1'06"	
	2:28.5	Woodwinds enter tremolo cloud	Textural oscillations in woodwinds: speed decreases concurrent with strings' <i>accel.</i>	20.25		
	2:48.75	Tremolo cloud ceases, leaving double bass and 'cello harmonics	Low strings harmonics start to move	29.25		
C	3:18	Pitch ascent	Upwards pitch movement emerges in ensemble as a whole	33	47"	♩ = 60
	3:51	Sudden drop in pitch	Sudden change from extreme high to extreme low register	14		
	4:05	Micropolyphonic double canon enters	Micropolyphony, leading to vast reduction in tessitura and consequent increase in volume	39	49"	(♩ = 30)
	4:44	Sudden drop in dynamic	Sudden change from extreme loud to extreme soft	10		b. 54 (♩ = 60)
	4:54	Single interval	Small-scale relationships perceptible in timbre, rhythm, pitch	13	39"	
	5:07	Sudden timbral change	Change from 'clear' woodwind to metallic brass and consequent expansion of tessitura	26		
(A)	5:33	'Return' of opening	Vast sound mass recurs, <i>diminuendo</i>	60	1'00"	♩ = 40
B(/C)	6:33	Brass breaths	Perhaps a continuation of overall <i>diminuendo</i>	11	33"	b. 78 ♩ = 60
	6:44	Fragmented tremolos	Textural oscillations passed between different parts of string section	11		
	6:55	Enter high flute harmonics	Slight rise in pitch, although generally static	11		
A	7:06	Veil of sound commences	Non-transforming web of string harmonic <i>glissandi</i> acts as background texture to flute harmonics and trombone/tuba pedal notes	11	1'30"	♩ = 40
	7:17	Flutes cease		4		
	7:21	Enter piano (brushes)		16		
	7:37	Enter low brass		13		
	7:50	Piano solo: low brass and veil of sound fade out		27		
	8:17	Piano brushes fade to silence	Silence	19		
	8:36	End	Conductor stops beating	-		

It is clear how the great arch is manifest. As the two descriptive columns illustrate, intensity of change increases towards the middle of the form and decreases towards the end; the three points of maximum difference all occur in the centre, whereas the outer ends concern gentler processes involving swells of dynamic. Furthermore, there is symmetry in the distribution of the transformative processes applied to the composite sonority. In broad terms, the arch-form might be expressed texturally, as below:

Ex. 3.17:



In the second half of the form, earlier transformations are synthesised, as they overlap: the second drop in pitch occurs simultaneously within the texturally oscillating veil of sound, for example. Thus, the overall shape is ambiguous. Listeners are afforded the opportunity to group large-scale sections in a number of ways, depending upon whether they hear textural processes as applied to material or simply materials as events in their own right. Arguably, at different times the musical surface gives rise to both of those approaches to perception inviting an ongoing, unconscious negotiation between the two.

The table sheds very little light on a proportional scheme, however. The right-hand 'duration in seconds' column shows that the second large-scale segment lasts for exactly half as long as the first ($1'06'' : 2'12'' = 1:2$), and this is the only strikingly obvious relationship. Similarly, showing smaller subdivisions, the left-hand 'duration

in seconds' column seems only to present incomplete patterns: the section at 4'54" divides into multiples of 13 seconds ($13'' : 26'' = 1:2$), and at 6'33" there are four consecutive 11 second subsections, although again, neither of these seems to fit within an overall plan. It would seem that despite Ligeti's comment that he typically dictated the duration of each formal segment in seconds, there is no strikingly obvious underlying pattern; neither the 'audible form' nor the inaudible 'internal structure' seem to be built around a proportional scheme measured in seconds. The question remains, therefore, how this demonstrably arch-shaped sequence of audible processes and events is controlled within a formal framework.

Given that this piece is concerned to some extent with the distinction between changes and transformations – fluctuations in the rate at which musical time passes – it is of fundamental importance to consider it in those terms. *Atmosphères* manipulates listeners' temporal perception. Crucially, music is not experienced in clock time, as listeners do not perceive its events in relation to fixed minute and second units but according to the experiential context with which these are presented. In more conventional works an underlying pulse is articulated, although as explained above, in this 'music free from rhythm' no such perceptual guide is available. Instead, at any given point the passage of time can only be perceived relative to the rate at which it passes in proximal events. In fact, the temporal structure controls that proximity in a highly sophisticated and beautifully simple manner.

Interlocking arches: 11s and 13s

It is no coincidence that, at tempi of $\bullet = 60$, there are patterns of 11- and 13-second periods in the table above; at one beat per second, those segments each last for their nominal amount of beats. These two prime numbers seem to act as the basis for the

formal framework in *Atmosphères*. In spite of the composer's note emphasising their insignificance, the presence of 110 barlines implies an underlying temporal grid, one which is neatly divisible into 11-bar groups. In the score, that approximate segmentation is overlain and interlocked with another set of divisions, mostly in 13-bar periods. The multiplication series of 11 and 13 as far as 110 are set out below, and the differences between the corresponding multiples are shown.

Ex. 3.18:

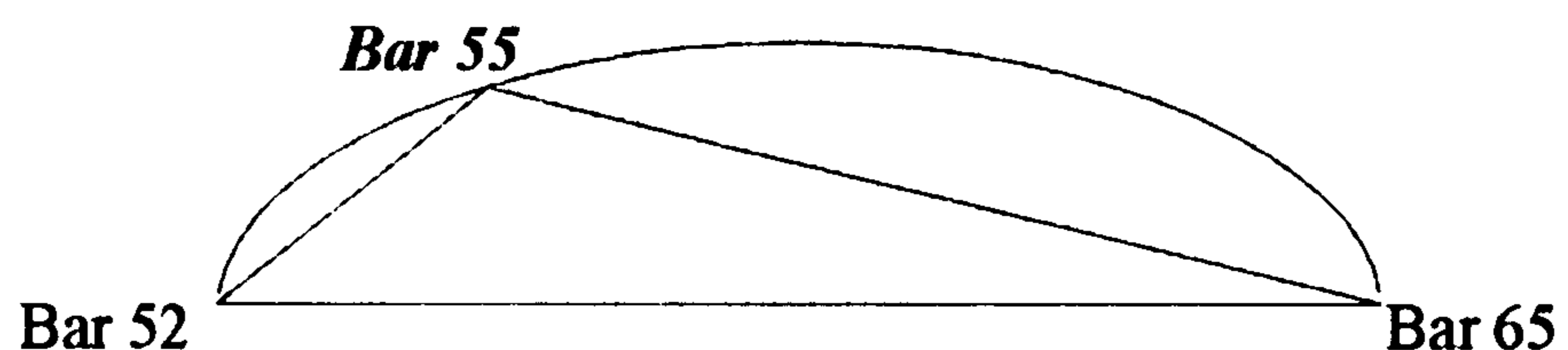
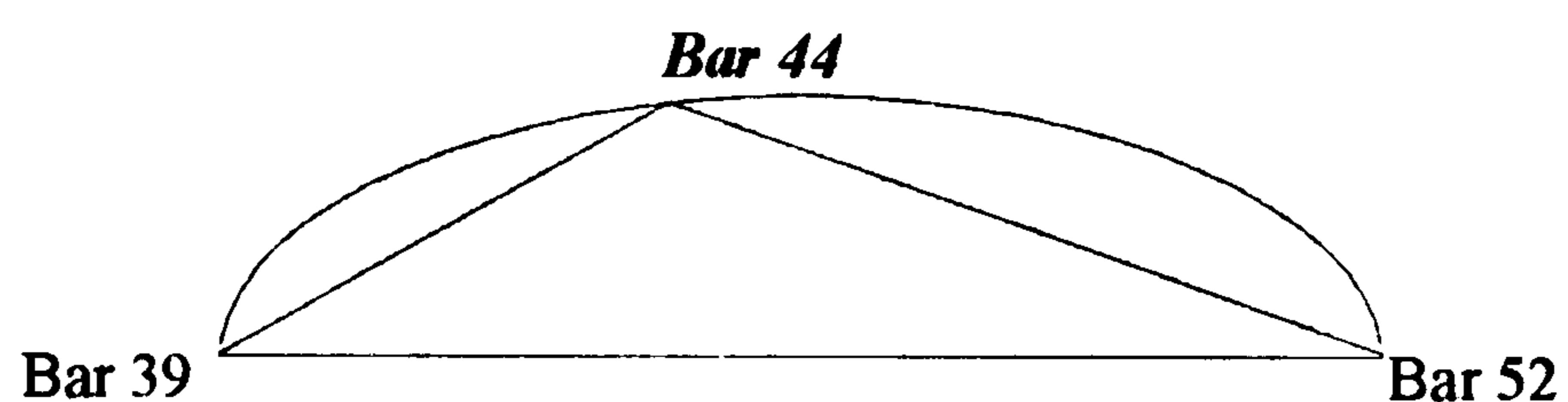
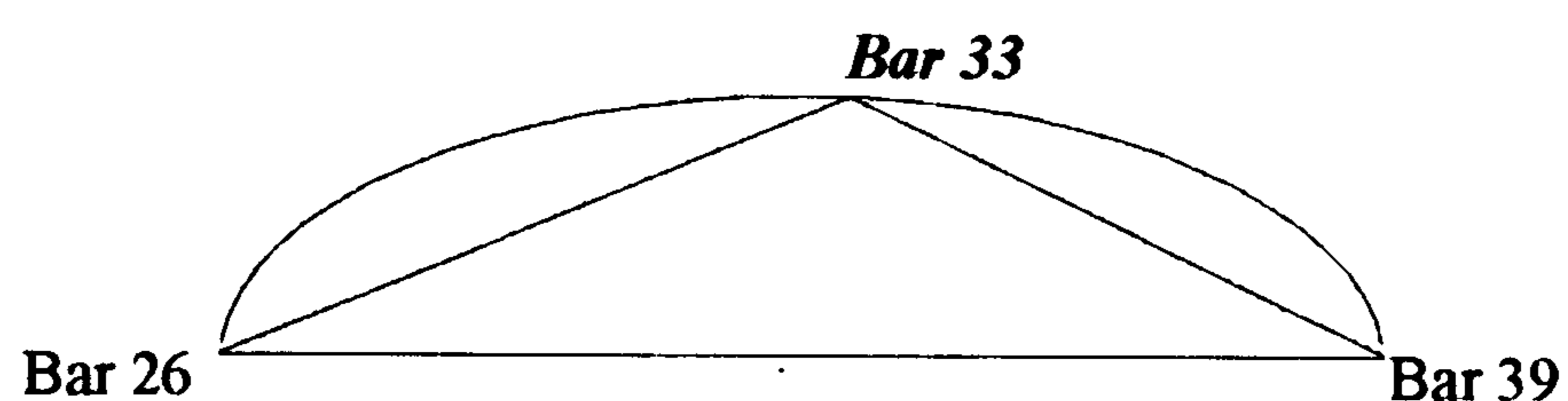
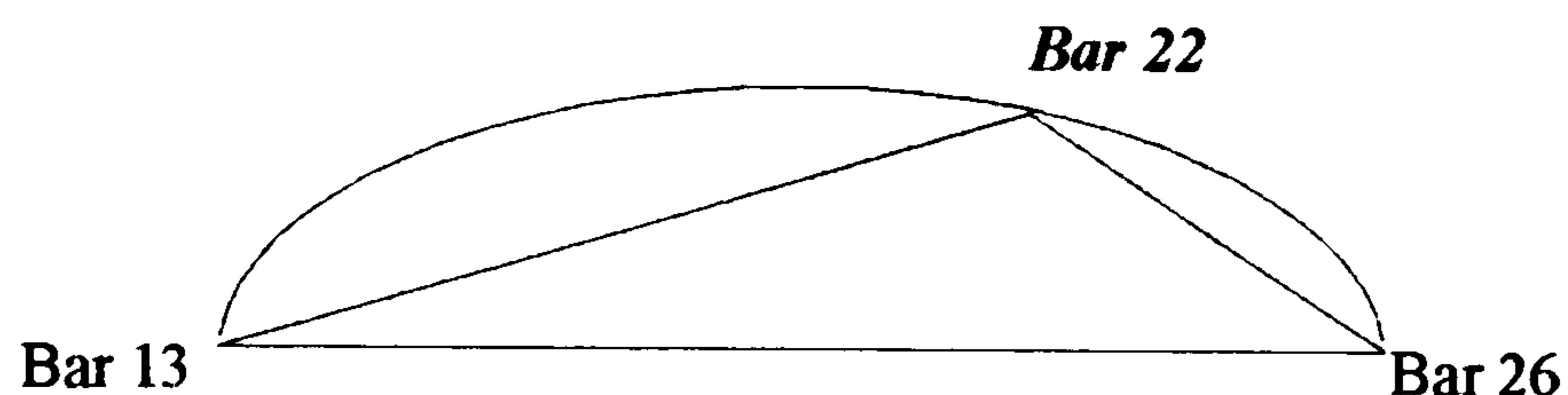
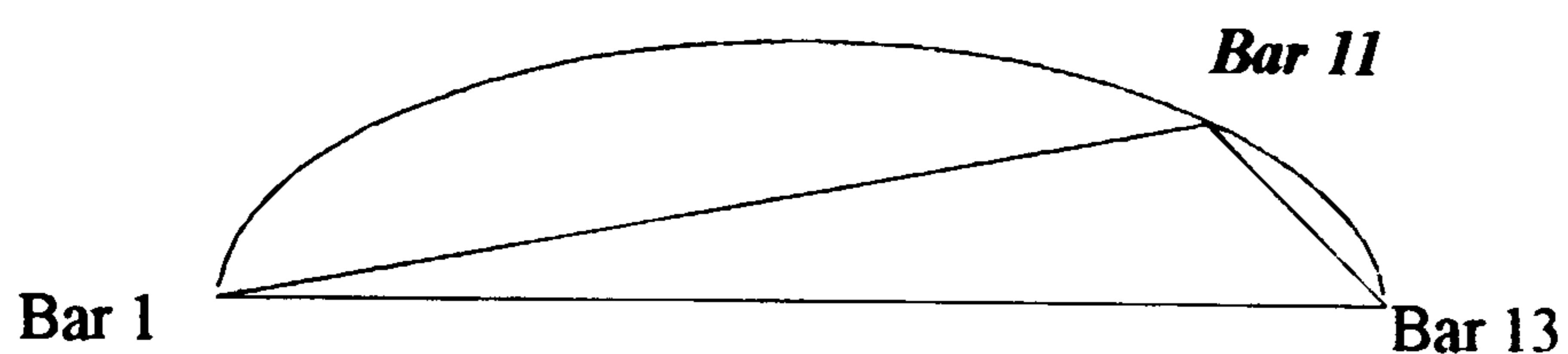
<u>11s:</u>	11	22	33	44	55	66	77	88	99	110
<u>Difference:</u>	2	4	6	8	10	12	14	16		
<u>13s:</u>	13	26	39	52	65	78	91	104		

There are two features worthy of note here: firstly, there are two points of near-coincidence, at 66/65 and 77/78; secondly, the differences between the numbers in the rows increase with each successive member. Interpolating the above two series to form a single sequence, a multiple of 11 will always fall between adjacent multiples of 13, such that the sequences alternate, as shown below (since the score starts at bar 1, that number is also included).

Ex. 3.19:

1	11	13	22	26	33	39	44	52	55	65	66 (etc.)
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The implications of this for musical time are more clearly expressed graphically (see Ex. 3.20).

Ex. 3.20:

Should, as is the case, all of the formal segments contain arch-shaped transformations, the point at which each one reaches its apex is pre-ordained and, conversely, the rate at which it does so is controlled, occurring more quickly in each passing segment. Thus, this proportional 'system' itself embodies a paradoxical relationship, as events are fixed on the one hand, and always shifting on the other; fluidity and fixity are both inherent to the scheme. Needless to say, in a piece as sophisticated as *Atmosphères*, the process is not manifest nearly so simply and uniformly as this hypothetical example might suggest.

To some extent, the distribution of states and events follows this basic arithmetic principle, although importantly, the implied pattern is corrupted in a number of ways. There are a number of tempo changes in the course of the work, various time signatures are used, and often transformations occur such that dimensions merge together; sometimes listeners might not be certain as to what is changing, never the rate at which it is doing so. Further, as the table in Ex. 3.16 shows, in many of the large-scale sections there are more than the two subsections implied by these neat beginning-midpoint-end shapes. It could be argued, therefore, that any effect such a framework might have on perception is negated due to the many implied irregularities.

The most potent argument that all of this is an attempt to try and stuff the work into an ill-fitting analytical box is that the implied template does not even correspond to the right number of (irregular) bars. Rather than precisely following multiples of 11 and 13 bars, the actual distribution of events subscribes to the following scheme:

Ex. 3.21:

	Opening cloud	Pairs of semitones (Vc & Vla)	Second cloud	Tremolo cloud begins	Pitch ascent	Micropolyphonic Double Canon	Single interval	(Drastic timbral change b. 60)	Formal return: cloud	Brass breaths	(High flute harmonics enter b. 83)	'Veil of sound' (String harmonics)	Enter low brass	Exit low brass	Conductor stops beating
'11s pattern'	9	23	10	11	10	11	11	11	11	11	11	10	22	8	
	1	9	13	23	34	44	55	66	77	88	98	102	110		
'13s pattern'	1	13	26	40	53	66	79	93	110						
		13	13	14	13	13	13	14	(17)						
	Opening cloud	Second cloud	Woodwind enter tremolo cloud	Pitch plunge	Huge drop in dynamic	Formal return: cloud	Fragmented tremolos	Enter Piano (brushes)	Conductor stops beating						

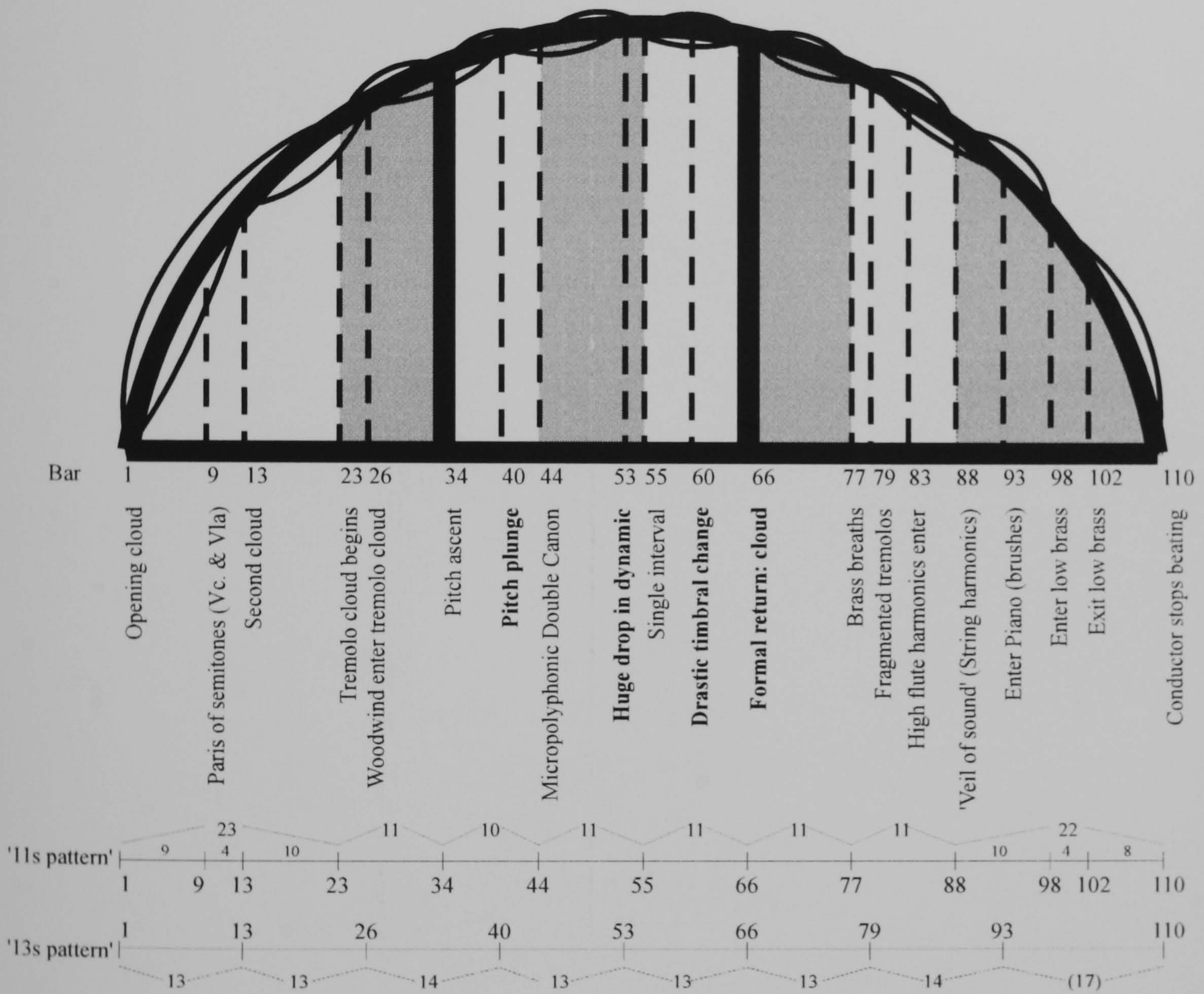
It is easy to recognise the many discrepancies with the absolutely regular pattern implied by the abstract numbers above, although it is equally as easy to recognise the symmetry brought about by two extended segments at either end of the 11s. Further, note that the first irregularity in the 13s – a fourteenth bar is added in the third segment – actually serves as a positive adjustment, rather than a mere negative inconsistency. On account of that extra bar, the near-coincidences mentioned above are ‘corrected’, such that the two sequences actually meet at the moment of formal return in bar 66. This ensures symmetry about that point, and also implies that just as the material itself ‘starts from the beginning’ once again, so does the temporal framework.

On the one hand, since no pulse is articulated in *Atmosphères*, much of this framework is imperceptible; in the absence of any downbeats, no bars can be heard. On the other, that in itself implies that time is perceived in a similarly ‘imprecise’, relative way to pitch and timbre – although the functions of the framework cannot be clearly discerned, they do nonetheless have a more subtle effect. As gifted a musical imagination and analytical mind as Ligeti’s would surely have been well aware of the perceptual implications of corrupting an ordered pattern. Indeed, his later piano *Étude*, “Désordre” (1985) is only the most obvious of many examples among his output which play on this notion explicitly. Arguably, this composer’s conception takes a knowing account of his listeners’ perceptions; if not arithmetically, the rate at which change occurs is controlled very carefully and deliberately. Thus, discrepancies in the regularity of the pattern might be cited as evidence of a positive attempt to heighten its communicative value, rather than to negate it.

Awareness of this pattern can only serve to enhance listening to this piece. Although it provides a means of rationalising the experience, it need not, indeed

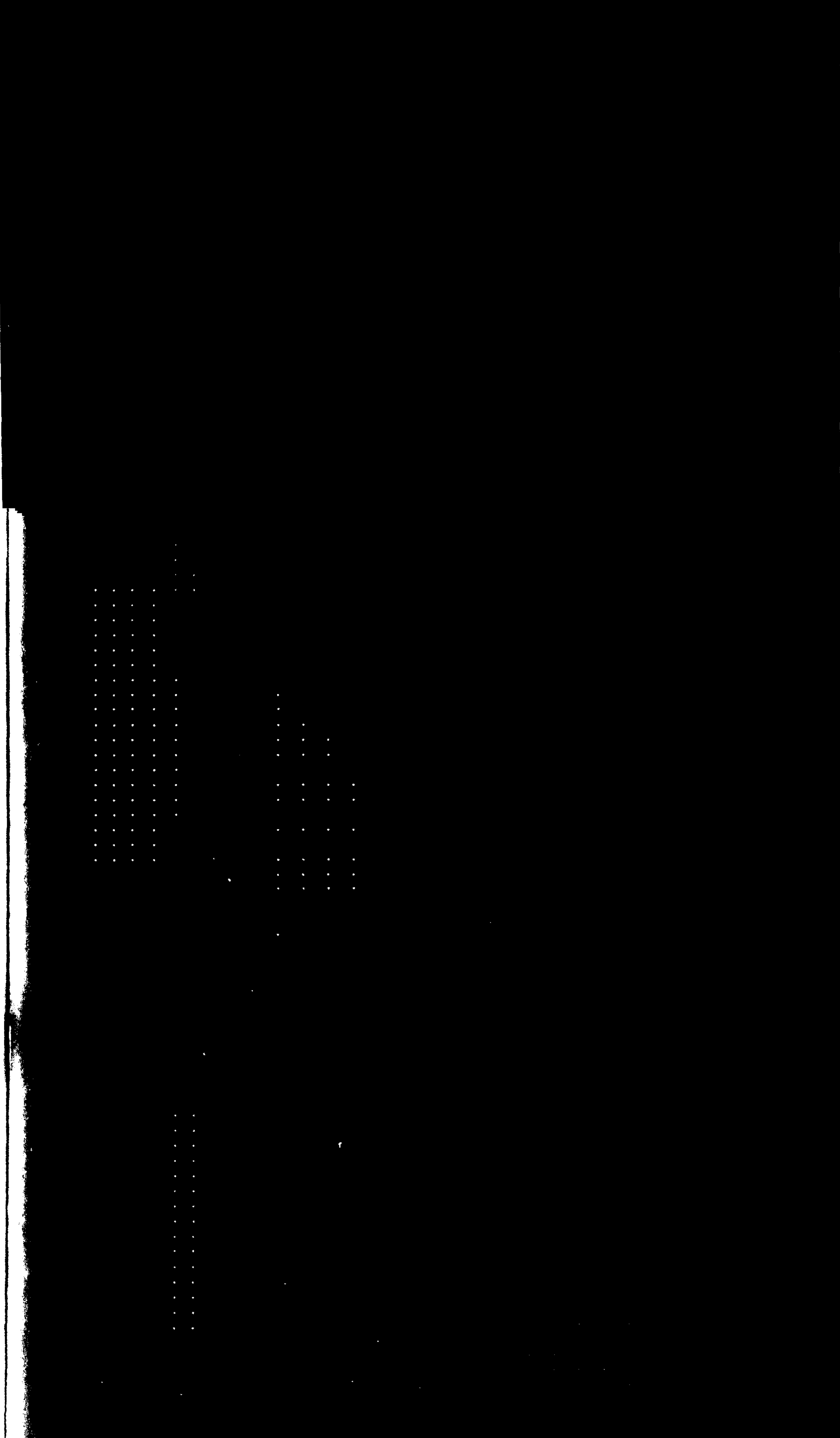
cannot, dictate it. As implied above, the specific points in musical time which it marks as significant are to some extent imperceptible, just as are the events in musical space which occur at them; this work concerns the surroundings of an object, rather than an entity in its own right. Effectively, it offers listeners the following network of transformations, in which connections might be made at various levels.

Ex. 3.22:



Atmosphères is manifest as a series of overlapping arches which connect in a single, global arch the various parts of an overall transformation of change itself. That overall shape divides into three sections, as closer to the middle of the form, the changes in intensity give rise to events of far greater magnitude (between bars 34 and 66) than the gentle transformations in the two outer sections. Those events and

transformations form smaller, internal peaks and troughs – smaller, surface arch contours which connect in a masked patterns of 11- and 13-bar periods. Thus, the piece offers listeners a network of connections which might function on a number of levels. This is, after all, music as communication.



MIDDLE C

Chapter 4

Putting Things into Contexts: *Jeux* and the Growth of a Motivic Network

What might seem trivial or unimportant to begin with can grow to become extremely significant. This idea is embodied musically in Debussy's *Jeux* (1913), although it might just as well be applied to the chronology running from the commissioning of the work by Diaghilev's *Ballets Russes* through to the première, and beyond that to its influence on musical history. There is some disagreement over the genesis of the ballet, although there is a consensus that, rather than a flash of inspiration or some sort of transcendental experience, its origins lie in a mere

... conversation over lunch between Diaghilev, Nijinsky, and the French painter Jacques-Emile Blanche ... Blanche records how Diaghilev charged him with writing the ballet's scenario and with telegramming Debussy, proposing that he write the music. Debussy, after first telegramming back "Subject ballet *Jeux* idiotic, not interested," later found the financial arrangement too tempting and agreed to the commission.

(Pasler, 1982: 60(f.n.1))

Thankfully, on this occasion, and not only in terms of Francs, triviality gave rise to significant figures. In the scenario, a game of tennis provides a tenuous background for a romantic encounter between a young man and two girls. The ball is lost in the bushes, and there, after initial flirtations and having danced together, the three are united in a 'triple kiss', soon after which another tennis ball is thrown on to the court – perhaps the audience were not the only people watching. It is easy enough to understand Debussy's initial objection to the narrative. As Pasler says, it all seems rather banal (ibid: 60). However, the artistic ideas to which it gave rise are actually very important. Rosaline George has it that significant figures of a different kind artists central to the early twentieth-century artistic avant garde, including Léon Bakst

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Thankfully, on this occasion, and not only in terms of Francs, triviality gave rise to significant figures. In the scenario, a game of tennis provides a tenuous background for a romantic encounter between a young man and two girls. The ball is lost in the bushes, and there, after initial flirtations and having danced together, the three are united in a 'triple kiss', soon after which another tennis ball is thrown on to the court – perhaps the audience were not the only people watching. It is easy enough to understand Debussy's initial objection to the narrative. As Pasler says, it all seems rather banal (ibid: 60). However, the artistic ideas to which it gave rise are actually very important. Rosaline George has it that significant figures of a different kind – artists central to the early twentieth-century artistic avant garde, including Léon Bakst

(the eventual designer for the ballet), and Jean Cocteau – were also at the meal (George, 1993: 719). On that occasion, Nijinsky commented on how he imagined the music:

There is no need to compose a theme. As a ballet progresses one shouldn't have to think any more profoundly than when one is looking at a painting or listening to a symphony. I wish to compose a score of movements in which everything will be defined by a bend of a finger, by the modulation of a muscle, and not by leaps and pirouettes; it will be a score that will reveal boundless possibilities for the human body.

(Nijinsky, quoted in George, 1993: 718)

Whatever the level of his understanding of music and the visual arts, the choreographer clearly had in mind a new kind of score. This is not the place for a full discussion of the relationship between the dance and the music, although elevation in the status of detail certainly finds resonance in the listening process. In the end, the project was discarded by the Ballets Russes after just five performances, and only parts of it were reconstructed by Kenneth Macmillan in the film *Nijinsky* (1980); *Jeux* is now a lost ballet (ibid: 719). Nonetheless, it is frequently performed as a concert piece, and indeed it is the implications of how this piece 'sounds together' that have generated decades of deep musical thought. Regardless of who was at lunch, and in line with the ethos of the Ballets Russes, the score is highly progressive, communicating what were then new ways of organising musical space and time. At the time of the première however, these innovations were overshadowed: a fortnight later, the same company performed the scandalous opening night of *Le Sacre du Printemps*, establishing Stravinsky as the *enfant terrible*. Indeed, alongside Schoenberg's *Pierrot Lunaire*, that piece is recognised as a radical step forward for twentieth-century music, although in its own quieter way, *Jeux* has made a similarly profound impact on musical history:

...references to it are scattered throughout the Darmstadt literature. These later composers were intrigued with *Jeux*'s often fragmentary material, frequent changes of tempo, nondevelopmental form, transformation of material, and discontinuities. The discrete sections in *Jeux* are sometimes static, but often they are in motion toward goals (or from sources) that do not appear in adjacent sections and may not even appear in the piece. Thus *Jeux* exists in a complex and fascinating temporal world of multiply-directed time that anticipates the still more radical "moment time" of Stravinsky, Messiaen, Stockhausen, and others.

(Kramer, 1988: 49)

In response to Nijinsky's request for a 'score of movements', Debussy composed a mosaic-like structure, built out of small blocks of materials, often only two or four bars in length, but sometimes longer and sometimes even shorter. This has a number of implications for the listening experience: timbre is elevated in perception, for example; and as Kramer says, time behaves differently at different points. As a result, the work was highly influential upon the notion of moment form and indeed resonates with that concept. However, it is important to try to consider *Jeux* on its own terms rather than to impose a Darmstadt-inspired reading upon it. Despite being discontinuous in so many ways, there is an underlying sense of unity and continuity.

Eimert: Waves and Chains

As evidence of the high esteem in which *Jeux* was held by the Darmstadt avant garde, this is one of the few works by a non-contemporary composer to be taken as subject matter in *Die Reihe*. Herbert Eimert's article in the fifth volume of the journal offers a wealth of information, and perhaps the most striking insight it offers concerns the motivic structure. His quasi-paradigmatic motivic analysis demonstrates that a great deal of the melodic content can be considered as part of a wave shape (see Ex. 4.1).

Ex. 4.1:

The image displays a musical score for Ex. 4.1, consisting of 14 staves. The notation includes various musical symbols such as notes, rests, and accidentals. Vertical dashed lines connect specific motifs across the staves, illustrating their recurrence. Measure numbers are placed throughout the score, including 'Takt 49' at the beginning of the first staff, and other numbers like 57, 142, 173, 475, 483, 490, 276, 677, 377, 253, 340, 566, 220, 387, 515, 403, 224, 84, 264, 435, 379, 82, 106, 635, 110 a, 110 b, and 309. The score is presented in a standard musical notation style with a treble clef and a key signature of one sharp (F#).

(taken from Eimert, 1957: 15)

Eimert's analysis is impressive in that it demonstrates an underlying, unifying connection between many of the motifs which make up so diverse and divergent a musical surface as *Jeux*. Ex. 4.1 is perhaps most remarkable on account of its margin for 'error', however. For the most part, *Die Reihe* is characterised by an almost

scientific, empirical approach to understanding and explaining musical phenomena (see Backus, 1962). In that context, Eimert's is a surprisingly 'loose' analysis. Various amongst the motifs shown do not actually conform to the wave contour (for example, those in bars 82, 106, 110b, 224, 635). Furthermore, there are other relationships which are not shown: the intervallic pattern 'descending-minor-third/ascending-semitone' is definitive of the materials at bars 224, 276, 403 and 635, for example; and in addition to these discrepancies there are various materials in the work which are not represented.

A primary strength of Eimert's analysis is that this diagram is not a comprehensive representation of motivic process, since that non-completeness and approximation in itself captures something of the listening experience. The challenge of fully defining and explaining this structure arises neither on account of any difficulty in perceiving abstract relationships between materials nor on account of a lack of them. Rather, the opposite is true. The challenge of mapping this network is due to the proliferation of connections rather than their inaccessibility: simple motivic associations saturate perception. The materials in *Jeux* are so highly interrelated that even grace notes have roles to play in the motivic process. Consequently, at any point, the melodic material can be seen to have evolved from transformations and/or syntheses of a number of earlier motifs. Effectively, listeners are presented with as many melodic networks as there are combinations of motivic connections in the work, and they might find their own 'route(s)' through it accordingly.

Since the materials are not shown in the order in which they occur in the score, Eimert's analysis expresses something of the discontinuous nature of the form, as well as links between motifs. In performance, this mixture of connection and disconnection

results in a peculiar type of continuity. Debussy's technique of varied repetition dates back much further than *Jeux*, although it finds a radical and subtle manifestation in the ballet:

All the themes (motives) of *Jeux* appear **at least twice**; **most of them** are repeated immediately. The **most frequently** appearing form is: Theme - Theme - Interlude - varied Theme, **with further variants** by repetition and thematic alteration.

(Eimert, 1957: 11; emphasis added)

Again, note the difficulty Eimert finds in making hard and fast rules to explain how the materials in *Jeux* are presented. He continually qualifies his comments, such that they cannot be taken as absolute statements of fact. Fundamentally, he observes the existence of motivic 'chains' in which perceptual connections arise 'over the top' of interlude material:



 Theme-Theme-Interlude-Varied Theme.

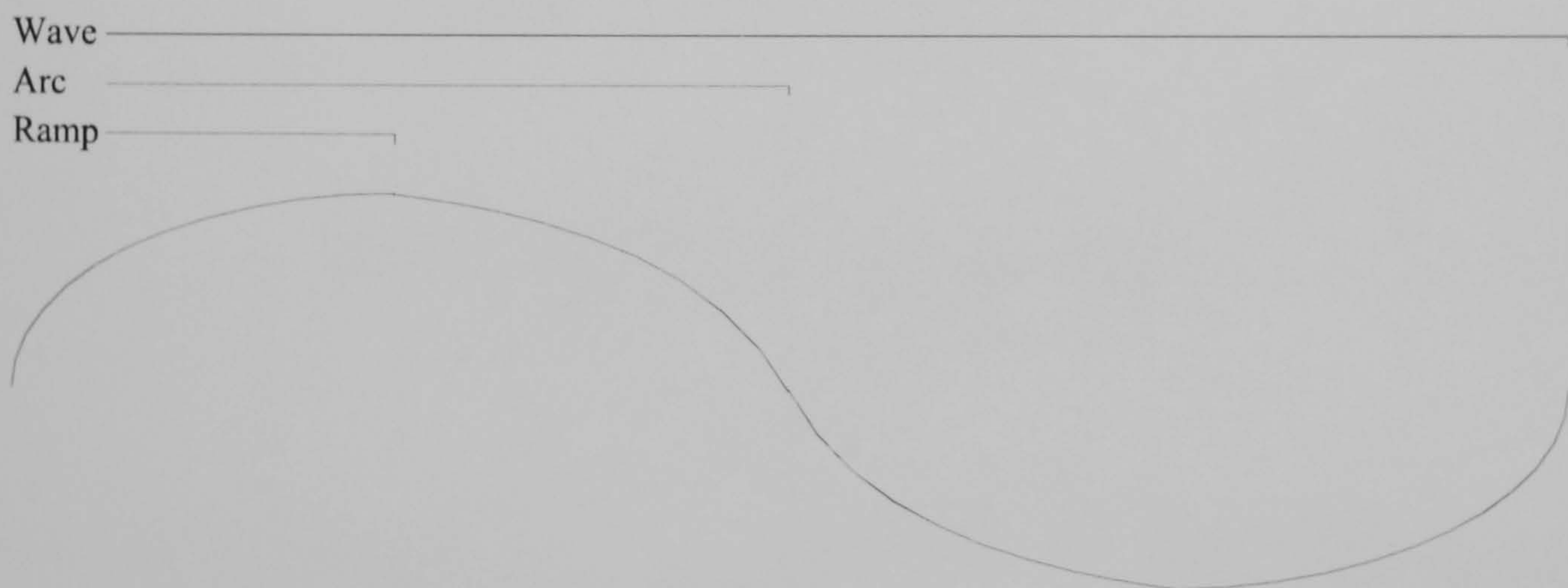
As Eimert concedes, this is only one of many formations which recur throughout the work, although the basic principle of hearing 'over the top' goes some way towards explaining how continuity is brought about. Such chains of motifs are 'open-ended' in that each one generates a new, varied theme. As earlier melodic ideas are constantly renewed, a line of development arises which on the one hand drives forward as new motifs evolve and, on the other, stretches back in time, linking the present to previous events. Furthermore, the 'Interlude' materials themselves are often transformed and renewed, having connections with events elsewhere in the piece; this results in other, alternative chains. By implication, a number of these (interrupted) continuities might be 'open' – in a state of interruption – at any point, such that a given motif might 'activate' connections in a number of such threads, thus joining them together. In

theory, it ought to be possible to trace each of these motivic chains of transformation throughout the piece, in a global web. Before exploring the notion of small-scale continuity any further, it is important to consider what this transformative process brings to bear on larger-scale developments.

Loosening constraints to allow the growth of waves

Margin for 'error' is one of the positives of Eimert's analysis, as it permits the inclusion of many motifs as part of the same shape. By loosening the paradigm further still, yet more material can be seen to conform. Fundamentally, a wave is a continuous succession of ascents and descents, and thus it might be partitioned as shown in Ex. 4.2:

Ex. 4.2:



Melodically speaking, at the most basic pitch-by-pitch level, there are three options at any given point: to remain on the same pitch, to move upwards, or to move downwards. Thus, inevitably, considered as ramp-, arc- and/or wave-figures, nearly all of the materials in the work might be seen to conform to part of this shape. Needless to say, such an understanding is hugely over-simplistic and inadequate to

express the subtlety at play in *Jeux*. The rich variety of ways in which melodic movement is brought about – the manner in which this basic wave shape is elaborated – is fundamental to the essence of the work and to the beauty of the listening experience. Thus, in a more all-inclusive sense than that implied by Eimert, underlying that diversity is the notion of a basic wave-contour; somehow or other, what goes up must come down.

Wave-contours, or parts of them, recur throughout the form, as Eimert demonstrates, although his analysis does not show that this gives rise to a large-scale process of growth. Ex. 4.3 shows a clear relationship between materials at bars 9, 150, 357, and 565 respectively.

Ex. 4.3:

The diagram illustrates a wave-contour relationship across four musical excerpts. Each excerpt is shown on a staff with a wavy line underneath it, and downward arrows connect the wavy lines from top to bottom, indicating the progression of the wave-contour.

- Excerpt 1 (b.9):** Bass clef, labeled "Vlas." and "Ves.". The wavy line starts low, rises to a peak, and then falls.
- Excerpt 2 (b. 150):** Treble clef, labeled "Fls.". The wavy line starts low, rises to a peak, and then falls.
- Excerpt 3 (b. 357):** Treble clef, labeled "Obs. & Cls.", "2 Fls. & Cor A.", "Cls.", "Fls.", and "Hns.". The wavy line starts low, rises to a peak, and then falls.
- Excerpt 4 (b. 565):** Treble clef, labeled "Cor A. & Hns.". The wavy line starts low, rises to a peak, and then falls.

The same melodic idea can be seen to increase in terms of both its compass and its duration in the course of the form, as it is repeated, literally, on different scales: firstly chromatic, then pentatonic, and so on. It is easy enough to show *that* the waves grow, although the subtlety of the process lies in *how* this occurs. The above is a particularly clear example of a motivic chain; should listeners make these connections, they would do so over intervals of at least 100 bars each time. In between these points, there is a great deal of 'chain activity', in which smaller motifs are synthesised. Since most of the motifs are 2 or 4 bars long, the overall process can be broken down into sections in many different ways. The table below is devised in accordance with the dynamic between motion and activity in the narrative, and significant melodic activity, as explained below.

Ex. 4.4:

<i>Section</i>	<i>Bar</i>	<i>Narrative</i>	<i>Musical events</i>
1	(0)	Setting the scene; introducing the characters	<i>Prélude</i> , interspersed with introduction and initial development of germinal materials
2	138	Girl 1 starts to dance; Young man joins in, leading to the mocking dance of Girl 2	Modulation to 'dominant', E; introduction of markedly 'new' materials.
3	331	The young man dances with Girl 2	New key signature: D ^b ; (chromatically altered) diatonic wave-contour introduced.
4	435	Girl 1's dejection at seeing the others dance together; they stop dancing and persuade her to join in	Pulse no longer articulated; fragmentary motifs before pulse returns
5	535	From now on, all three dance together	Extended melodies (eight bars or more before recurrence occurs)
6	689	A second tennis ball drops on the stage	Return of material from the start of the work (motif at bar 70, followed by <i>Prélude</i> material).

Notably, the remarks in the right hand column of the table are not of the same type: some refer to tonal modulation, others to temporal or melodic events. *Jeux* cannot easily be broken down into a single, overarching formal scheme, although there seem to be larger-scale patterns in its motivic activity if the score is divided as above.

First Section

Motivic activity

The work opens with a *Prélude* in which a rising semitonal motif played by horns and harps is set against whole-tone chords in the woodwind, all sounded over a pedal B in the strings. As the opening section proper begins, that preliminary opposition recurs as the first of the materials to be developed are introduced; at bar 9 a chromatic figure is repeated three times (the second time played by unpitched percussion), followed by a second motif at bar 15 in which the interval of a tone is twice displaced by an octave (see Ex. 4.5).

Ex. 4.5:


The significance of these seemingly trivial shapes increases vastly as they are transformed and developed in the course of the section and, ultimately, the entire work. Pasler gives a detailed verbal account of how this occurs by means of

combinations of the latter half of the bar-9 material and other motifs, the use of the bar-15 motif as an accompaniment to the first, and so on (Pasler, 1982: 61-4). The section can perhaps be expressed most clearly as a motivic web (as shown in Ex. 4.6), rather than in a running commentary.

Ex. 4.6:

The diagram illustrates a motivic web with the following components and annotations:

- b. 9:** Vlas. and Vcs. staves. Annotated with "Chromatic descent".
- b. 15:** Vlns. pizz. and Vlas. pizz. staves. Annotated with "Whole-tone/octave displacement".
- b. 30:** Cor A. & Vlas. staff. Annotated with "Chromatic descent" and "Short-short-long".
- b. 49:** Cls. staff. Annotated with "Chromatic descent".
- b. 57:** Cor A. staff. Annotated with "Scalic Ramp".
- b. 70:** Fls. & Vlns. and Strings pizz. staves. Annotated with "Short-short-long" and "Pentatonic motion".
- b. 74:** Obs. & Bsns. and Vln. 2 staves. Annotated with "Short-short-long (= Long-short-short)".
- b. 84:** Hps. & Vlns. staff. Annotated with "Wave contour".
- b. 118:** Ob. & Cl. and Vlns. staves. Annotated with "Chromatic descent" and "Scalic Ramp".

Each individual connection speaks for itself, although it is worth discussing how they combine to form lines of motivic transformation. The most prominent derives from bar 9, since the opening motif bears a clear relationship with the extended wave-shaped phrase at the end of the section (bar 118). Undoubtedly the most important connection in the network occurs at bar 30, where that initial chromatic descent is presented as a short-short-long () figure. That rhythm brings about relationships with almost all of the other materials: at bar 49 it immediately precedes a diatonic ramp which is later used in conjunction with a variant of the original semitonal motif (bar 57). Also, albeit less than apparent in the listening experience, note that the melody at bar 84 conforms to that rhythmic distribution (bar-two bars = short-short-long): aurally, the material itself is related more closely to the initial chromatic descent.

The events in bar 30 have significance outside of the line of development which stems from bar 9, as they also make possible a connection with the second of the opening materials (bar 15). The relationship between that initial whole-tone motif and bar 70 is obvious: octave displacement of various whole-tone intervals is inherent to its descending pentatonic flourish (A-G; E-D-C). Following this, that figure is repeated more slowly as 'short-short-long' in bar 75, notably preceded by that same rhythmic pattern expressed using grace notes (bar 74). Having observed that such small-scale decorative material plays a part in the motivic process in this section, it is worthwhile taking a higher perspective, noting the trend of evolution in its larger melodic shapes.

First section: wave activity

Broadly speaking, the motifs at the top of Ex. 4.6 are ramp-shaped gestures. Albeit bar 9 is strictly speaking a wave, it brings about an overall movement downwards, as is confirmed in bar 30, one which is set against the upward octave leaps of the bar 15 motif. As the section progresses, bars 57, 70 and 74 all present arc-contours, which are in turn followed by a gentle wave shape in bar 84 and a fully-pronounced one at bar 118. In that final phrase, almost all of the motivic elements of the section are brought together in a single continuity: the bar-49 motif leads to the bar-57 variant of bar 9, which leads in turn to an inversion of the bar-30 rhythm, long-short-short. Thus, in addition to presenting and ultimately conjoining small-scale chains of motivic synthesis, this first section also contains the tentative beginnings of the global process through which melodic waves grow.

Second Section*Motivic activity*

The second section seems to present a great many 'new' melodic ideas, in keeping with developments in the scenario, as the characters start to dance together. Fundamentally, however, it involves the juxtaposition and synthesis of earlier materials – the initial figures in bars 9 and 15. To some extent, that initial opposition can be traced in this second part of the form. In the first section, distinctive variants of those two motifs were established: the short-short-long rhythm was used to introduce pentatonicism, for instance. Here, the process is taken a step further, as more variants are added, and other aspects of the original materials are developed:

Ex. 4.7:

b.9 Vlns. Vcs.

b.15 Vlns. pizz.

Chromatic descent

Whole-tone/octave displacement

b.142 Bsn.

Chromatic motion

b.150 Fls.

Whole-tone/octave displacement

b.174 Fls.

Vln. 1

Chromatic descent

Hemiola

Dotted rhythm

(+ Vlns.)

b.178 Vlns.

Vcs.

b.206 Strings

Whole-tone/octave displacement

b.224 Strings

Hemiola

b.226 Vln. 1 (1 desk)

Vln. (1 desk)

Minor 3rd/
Ascending Semitone

Dotted rhythm

b.230 Hp.

Strings

Whole-tone/octave displacement

b.254 Tpts.

Hns.

Vcs.

Whole-tone/octave displacement

b.276 Strings

Short-short-long

b.284 Hn.

Vln. 1 pizz.

Vln. 2 arco

Wave contour

b.309 3 Obs. & Cor A.


The clearest line of development here concerns the whole-tone motif rather than the semitone figure as in the first section. After a brief fanfare (not shown), a chromatically ornamented hemiola (bar 142) is repeated, interspersed with the pentatonic wave at bar 150, which ultimately derives from the whole-tone figure in bar 15, as explained above. The idea of displacing that interval by an octave is central to materials in bars 206, 230 and 254, and then acts as the basis of the violin texture at bar 284, which accompanies a simple whole-tone motif in the horn. Significantly, this line of development goes no further after the point at which it has been combined with the chromatic element in the passage at bar 284, as the piccolo enters with its repeated short-short-long descent.

In creating such vivid transformations of the same minimal, whole-tone idea, Debussy displays the richness of his compositional invention. Even greater variety is derived in this second section from the chromatic, bar-9 motif. Bars 142 and 174 are related to that original material simply because their melodies move through the chromatic scale, although those in bars 224 and 276 emphasise another of its aspects:

Ex. 4.8:

The diagram illustrates the transformation of a chromatic motif. At the top, a single staff (b. 9) shows a chromatic descent, with the first part labeled 'Vlas.' and the second part labeled 'Ves.'. Below this, two staves are shown. The left staff (b. 224) is labeled 'Strings' and shows a 'Descending Minor-3rd/Ascending Semitone' interval. The right staff (b. 276) is labeled 'Strings' and shows a 'Descending Minor-3rd/Ascending Semitone' interval. A 'Chromatic descent' label is placed between the top and bottom staves, with lines indicating the relationship between the motifs.

As shown, the distinctive intervallic features of both later variants are also inherent to their origin (bar 9), although these new materials are actually more remarkable for their differences in character from that opening motif. One such distinctive feature is their scoring – for ‘stacked’ strings – in which pitches are doubled at the octave, often resulting in homophonic chords spanning huge ranges. That sonority runs throughout this section; it is also a feature of the orchestration at bars 174, 178, 206, 226 and 230, implying a timbral link between the chromatic and whole-tone lines of development.

Where timbre serves to connect these two lines of development, rhythm offers a means of distinguishing between them. Two distinctive rhythmic elements come to prominence here, and both are added to the chromatic chain. Cross-rhythms of many kinds appear in various parts of the texture prior to the second section, although they are never made quite as explicit as at bar 142. Since pitch remains constant almost throughout this motif its rhythmic features are elevated in perception; and following this, hemiolas characterise many of the emergent materials, such as those at bars 178 and 226 (see Ex. 4.7). The former also exhibits the second rhythmic pattern to be brought to the fore: . Other dotted rhythms are inherent to the motifs in bars 142 and 174, although this particular version seems to be made distinctive in *Jeux*. Its shorter, middle impulse implies continuation. There is only one passage in the entire work in which a shorter impulse is not followed by a longer one (woodwind, bars 553-560), and even in that instance the violins play the pattern shown. By changing the order of events (and sometimes using double-dotted rhythms) to create variants, bars as a whole can be given rhythmic implications. Hemiolas and dotted-rhythm figures recur in various guises throughout the form.

Second section: wave activity

In the first section, there was a clear melodic progression from ramp to arc to wave, resulting in the first unmistakably recognisable full-wave contour at bar 118 – the building of a network. No such ordered pattern is apparent in the second section. Moving down the page in Ex. 4.7, melodic waves are manifest in a number of ways. At bars 150 and 178, they are manifest using the pentatonic and octatonic scales respectively; and at bar 264, the flutes' arc motif is repeated, creating a wave spanning over an octave. At other points the shape is less pronounced; at bar 174 it has a very shallow, chromatic contour, and it is used as an ornament to the hemiola motif in bar 226.

Arguably, the lack of a clear ongoing process of wave growth is due to the addition of 'new' motivic elements in this section, which heighten the importance of small-scale transformation. The brief and discontinuous nature of the original whole-tone motif (the idea of octave *displacement* is inherently suggestive of a lack of smooth melodic progression) means that its variants do not lend themselves to extended, continuous shapes. Further, the development of the chromatic motif brings to prominence particular rhythmic and intervallic cells, rather than extensions of the melodic gesture. Nonetheless, this section ends in a wave-shaped melody, first heard at bar 309, which is itself a variant of that in bar 84 (see Exx. 4.7&6 respectively). Its duple metre prohibits hemiolas, although it contains both a dotted rhythm and the descending-minor-third/ascending-semitone pattern added earlier. Thus, in some sense, it represents a synthesis of the prominent motifs of this section, whilst also contributing to the global process of melodic wave growth.

Third Section: Motivic Connections and Larger-scale Concerns

The music played by the upper strings at the beginning of the third section combines a number of the elements established earlier in the work: a tone displaced by an octave – a variant of the original motif in bar 15 – is repeated as a hemiola rhythm, incorporating both triplets and the short-short-long pattern (see below).

Ex. 4.9:

The image shows a musical score for three instruments: Violin 1, Violin 2, and Viola. The score is in 3/8 time and features a hemiola rhythm. Annotations include:

- Hemiola**: A bracket above the first two measures of the Violin 1 part.
- Short-short-long**: A bracket above the first measure of the Violin 1 part.
- Tone/Octave**: A line pointing to the interval between the first and second notes of the first measure in the Violin 1 part.
- Triplet**: A bracket above a group of three notes in the Viola part.

By implication, a number of motivic chains meet at this point. After only four bars, however, the texture is modified and reduced to providing the background accompaniment to an extended wave melody in the clarinet (see Ex. 4.10):

Ex. 4.10:

The image shows a musical score for two instruments: Clarinet and Strings. The score is in 3/8 time and features a wave melody in the clarinet. Annotations include:

- (Short)**: Brackets above the first two measures of the Clarinet part.
- (Long)**: A bracket above the last two measures of the Clarinet part.
- (Repeat)**: A bracket above the last two measures of the Strings part.

The idea that motivic activity is secondary to the presentation of larger-scale melodic lines is manifest in a number of ways here. Most simply, distinctive rhythms are used as a mere accompanying texture rather than as the primary focus. Further, notice that the melodic structure follows the short-short-long pattern; although that configuration applies to the phrasing overall, it cannot be heard at the motivic level in the clarinet. Instead, local-level rhythms are consistent, making this as 'pure' a wave as possible; it consists simply of uniform ascending and descending motion. The first and second sections of the form both ended in full waves as opposed to ramps or arcs (bars 118 & 309: see Exx. 4.6&7), although in neither instance were they so explicitly formed as this. Whereas those earlier examples can be separated into independent motifs, after two initial ramps the material here is a single, continuous shape. Thus, waves 'reach maturity' in this section, inviting a hearing from a higher perspective, as fully-fledged melodic phrases become the primary focus.

Third section: waves fully formed in size and scale(s)

One of the most significant passages in *Jeux* begins at bar 357. Marked 'Joyeux', it certainly elicits a feeling of excitement in the listening experience, as various lines of development coincide roughly halfway through the 709-bar form (see below).

Ex. 4.11:

The musical score for Ex. 4.11 begins at bar 357. It is written for a woodwind and string ensemble. The top staff contains parts for Oboes and Clarinets (Obs. & Cls.), two Flutes and Cor Anglais (2 Fls. & Cor A.), Clarinets (Cls.), Flutes (Fls.), and Horns (Hns.). The bottom staff is for Horns (Hns.). The music features a complex texture with many overlapping notes, creating a shimmering, wave-like effect. The key signature has two flats, and the time signature is 3/4.

Like 'stacked' strings, small, closely-scored groups of the same instrument are a recurrent sonority, implying points of synthesis within the timbral network as the wave flows from one woodwind trio to the next. Further, this is one of the few points in the work at which it is true to say that the music is 'in a key'; E² is firmly established as a tonal centre, albeit only fleetingly. The present concern is melodic, however, and arguably the wave contour dominates the passage rather than the horn motto which it 'accompanies'; again the more extended melodic element takes precedence over the shorter motivic one. Lasting ten bars and spanning over three octaves, this marks a point of culmination in the global process of wave growth, and as it is heard three times it is a defining feature of the third section as a whole.

The distinction between the large and the small is inherent to the melodic structure at this point. For most of the third formal section extended waves (as in Exx. 4.10&11) alternate with less expansive ones, as demonstrated overleaf in Ex. 4.12. The first four examples consist of movement through diatonic scales, implying that since they are interpolated with larger patterns of scalar motion, most of the section could be understood as a single melody. That idea finds little resonance with the listening experience, however, due to continual changes of harmony. Further, the last figure shown is not a 'pure wave': instead it brings together two motivic elements from section two: the dotted rhythm and the descending-minor-third/ascending-semitone intervallic pattern. Again, this demonstrates the importance of loosening analytical constraints in understanding the work: although there is a large-scale pattern of wave activity, it cannot be observed absolutely. Ex. 4.12 shows that waves do not occur between bars 377 and 386, and accordingly the third section of the form might be divided into three subsections about those 10 bars.

Ex. 4.12:

Solo Clarinet wave in bar 335 (see Ex. 4.10) →

→ Chromatic Cor A. descent continues, leading to Hn. at bar 352

Cor A. descent passed to Bsn. →

→ Leads to extended wave in bar 357 (see Ex. 4.11)

Extended wave at bar 357 →

→ Leads to inversion of 'bar 84' melody and inner subsection (see Ex. 4.14)

Bars 377-386: inner subsection; no wave figures

Inner subsection →

→ Leads to extended wave in bar 396 (as in Ex. 4.11)

Extended wave (bar 396) →

→ Played in various transpositions, leading to incomplete extended wave (as in Ex. 4.11) at end of third section

In terms of the narrative, the inner subsection coincides with the points at which the second girl and young man disappear behind a clump of trees. Musically it consists of a sequentially repeated four-bar passage, shown below (see Ex. 4.13). On

repetition it is transposed up a minor third and extended by two bars, in which the final chord is sustained, before a link into the next subsection.

Ex. 4.13:

The musical score for Ex. 4.13 is written in 3/4 time. It consists of five staves: Flute, Oboe, Trumpet in B \flat , Violin, and Strings. The Flute part begins at bar 377 with a melodic line marked with a '6' (sexta) and a '7' (settima). The Oboe part has a similar melodic line. The Trumpet in B \flat part has a tremolando texture. The Violin part has a melodic line marked with a '6' and a '7'. The Strings part has a tremolando texture. The score is labeled with 'b. 377' and 'Fls. & Cl.'.

In keeping with the implied mysteriousness of the scenario here, this material sounds peculiar in the context of the ballet, on account of its slower, 3/4 time signature and polytonal voice-leading. The principle motifs themselves (oboes, bar 377; first violins, bars 379-80) continue the opposition between whole-tone and chromatic lines of development, although because of their orchestral setting they sound somewhat distinct from earlier motivic chains.

Bars 378 and (its equivalent on repetition) 382 are possibly unique in *Jeux*, since these are the only ones without any melodic content. Instead they simply contain tremolando-textured harmonic trills. Naturally, this raises questions of how they fit in to a form of interrelated motivic and melodic patterns. Together, bars 373-8 resemble events between bars 70-84ff: in that earlier passage there is a flourish, soon followed

by flute and string tremolandi as the first tennis ball drops on to the stage (see Ex. 4.14, below). Thus, to some extent the connection between these points concerns timbre and texture rather than motifs, although it is also important to note the relationships between the surrounding materials.

Ex. 4.14:

Bars 70-84ff.

Flutes flourish → Trilling texture → Bar 84 melody

The diagram shows three stages of musical development. The first stage, labeled 'Flutes flourish', shows a score for bars 70-76. The flute part features a complex, trill-like flourish. The second stage, 'Trilling texture', shows bars 76-84, where the flute's flourish is integrated into a broader texture of trills across various instruments. The third stage, 'Bar 84 melody', shows the specific melodic line of bar 84, which is a direct continuation of the trilling texture.

Bars 373-8

Inversion of bar 84 melody → Flutes flourish → Trilling texture

The diagram shows the development of the bar 84 melody. The first stage, 'Inversion of bar 84 melody', shows bars 373-378, where the melody is inverted and played by the flute. The second stage, 'Flutes flourish', shows bars 378-384, where the inverted melody is further developed into a flourish. The third stage, 'Trilling texture', shows the final development of the material into a trilling texture.

This demonstrates that connections between materials function at levels other than the motivic. Thus, to some extent *Jeux* invites redefinition of the concept of 'motif' beyond pitch and rhythm, to encompass so-called secondary parameters in more conventional music.

The third section can be divided clearly into three parts, corresponding to patterns in the melodic structure and in the narrative. Wave contours are allied with

visible movement on stage, and their absence with its concealment; those shapes accompany the Young man and Girl 2 as they dance together in the outer two subsections, whereas in the inner episode, in which the girl hides in the bushes, they are absent.

Ex. 4.15:

Bar	Scenario ¹	Time Sig.	Key Sig.	Melodic Material
331	The young man...[is] unable to resist his desire to dance with the other [girl]	3/8	D ^b	Solo clarinet: extended melodic wave
347	The second girl repeats his movements, mockingly			<i>Small diatonic wave motif</i>
357	They dance together		E ^b	Extended diatonic wave (with horn motto)
367	Their dance becomes more tender	<i>Small wave motif (leading to inversion of bar 84 motif)</i>		
377	She detaches herself and hides behind a clump of trees	3/4	'C' (n/a)	Sequential repetition of 'incidental' motivic material
387	Vanishing for a moment, they soon reappear, the young man pursuing the girl	3/8	E ^b	<i>Small diatonic wave motif</i>
396	They dance a new dance together			Extended diatonic wave (with horn motto)
403				<i>Small 'bi-tonal' wave motifs</i>
421				Extended diatonic wave (No horn motto)
429	Carried away, they have not noticed the anxiety...of the first girl... Her friend tries to hold her.	4/8		Arrival at dominant, B ^b : synthesis of whole-tone and chromatic motif

Time- and key signatures are included in Ex. 4.15 in order to illustrate the larger-scale sense of form at this point. The middle part is distinct from the outer ones in terms of metre, tonality, and melodic content, the present matter for discussion. This implies a greater sense of continuity within each subsection than previously, and it would be unfaithful to the listening experience to present the third-section materials as a

¹ Note: the scenario indications are taken from the piano reduction. They are not given in the orchestral score.

network of fragmentary motifs. Instead, they are discussed below in terms of how they characterise their particular subsections.

Organic growth and continued synthesis

The materials of the first three parts of *Jeux* are interrelated through two ongoing processes. Firstly, small motifs derived from an initial opposition between chromatic and whole-tone materials are continually combined in different ways and joined together in chains; and secondly, a particular figure – the wave contour – ‘graduates’ to become a fully-fledged, extended melody in the third section. Almost all of the motifs conform to particular parts of that shape, meaning that those two lines of development are inter-cut and thoroughly entwined, to the extent that the division between them hard to perceive. Thus, what starts out as ornamental gradually takes on fundamental importance as the form progresses, and the points at which that change occurs are rendered imperceptible. In the first half of this form, so highly characterised by change, perhaps the only constant is the underlying sense of organic growth. Like the branches of a tree, all of the materials are interconnected; and although the diversity of their surface characteristics implies that they shoot out in many different directions, there is an underlying, uni-directional process of growth at play. Thus, despite the many branches, there is nonetheless a single tree trunk, the basis of an organically growing network.

In keeping with the changeable nature of the musical surface, one might switch between this and another, similarly topical metaphor: a game of cards – ‘un jeu de cartes’. After having presented a fully developed wave melody at bar 357 (see Ex. 4.11), Debussy has shown his compositional hand. After that point, he can only

present the various ‘cards’ which make it up in different combinations: although the same few germinal elements are used to derive materials with astonishing novelty throughout the form, they have all been exposed by the end of the third section and can only be continually re-synthesised from then onwards. Thus, after the process of growth has reached that point, its uni-directionality ceases to have such fundamental importance; once the trunk and branches are in place, and a tree begins to bloom, blossom emanates in various directions, rather than merely ‘upwards’.

Sections 4, 5 and 6: Perceptual Tendrils

Given that materials can be considered ‘mature’ after the third part of the work, there is little point in continuing to apply the same, detailed level of analysis above to the fourth, fifth and sixth formal sections. Instead, examples taken from each are given below and illustrated in terms of their intervallic, rhythmic and melodic derivation. That materials are so thoroughly interrelated would seem to imply that in general no particular motifs are any more structurally important than others, and accordingly no such significance is attached to the choice of examples. Rather, they are particularly clear instances of synthesis and reinvention.

The motivic characteristics which come to prominence are named below:

<i>Intervallic</i>	<i>Rhythmic</i>	<i>Melodic</i>
Chromatic descent	Short-short-long	Ramp
Whole tone/octave displacement	Semiquaver triplets	Arc
Pentatonic movement	Hemiola	Full wave contour
Descending-minor-third/ ascending-semitone	Dotted rhythm	

This list does not purport to be a comprehensive catalogue of the underlying elements of every motif in *Jeux*; there are certainly examples of other intervallic and rhythmic

configurations which recur as inherent parts of other materials.² Once again, the proliferation of potential motivic networks is apparent, although for the present purposes these eleven elements suffice to illustrate the ongoing process of synthesis.

These germinal ideas continue to be combined to create materials in the final three sections of the form. However, by this point, motivic derivation itself has a different implication, since whether consciously or not, listeners are familiar with all of these elements by this point. Thus, the very notion of 'a new motif' is cast in a different light. Rather than extending the ongoing line of motivic development (the trunk and branches of the tree), materials bring particular ones amongst these elements to fruition (as leaves, or blossom). By analogy, the items in the list above represent perceptual tendrils – potential bases for motivic connections which might be activated at any point. Accordingly, together they act as a memorised ground against which perceived figures are heard. The diagrams below attempt to express this graphically and require very little explanation.

From the fourth section are taken passages at bars 445 and 473 (see Exx. 4.16&17). It is easy to see how these materials derive from the motivic elements named above: in Ex. 4.16 the descending minor-third/ascending-semitone figure is combined with a short-short-long rhythm in two melodic arcs; in Ex. 4.17 a variant on the 3/8 dotted-rhythm figure in the bass is accompanied by octave-displaced triads in the woodwind, prior to a chromatic descent spanning a whole tone, which similarly shifts register.

² (An octave-displaced pizzicato alternation between the harmonic root and fifth recurs throughout the score as an accompanying figure for instance: see bars 84-105, 161-163, 315-319, 389-396, 515-520.)

Ex. 4.16:

Chromatic descent

Whole-tone/
Octave displacement

Melodic Ramp

Pentatonic movement
(Tone/Minor 3rd)

Melodic Arc

Minor 3rd-descent/
Semitone-ascent

Melodic Full wave

Short-short-long

Semiquaver Triplets

Dotted Rhythm

Hemiola
(Various cross-rhythms)

(Vins. & Vlas. Soli)

Bar 445

Strings

(Vca.)

(3 Vca. Soli)

(3 Vc. Soli)

Ex. 4.17:

Chromatic descent

Whole-tone/
Octave displacement

Melodic Ramp

Pentatonic movement
(Tone/Minor 3rd)

Melodic Arc

Minor 3rd-descent/
Semitone-ascent

Melodic Full wave

Short-short-long

Semiquaver Triplets

Dotted Rhythm

Hemiola
(Various cross-rhythms)

Fls., Cls., Tpts., Trns.

Bar 473

Woodwind and Brass

Bsns. & Hns.

Obs.

B. Cl.

Strings

Notice also that both examples are characterised by their ‘stacked-strings’ orchestration; as well as motivic materials, distinctive timbres continue until the end of the work.

The fifth section of the form, which lasts from bar 535 to bar 688, is dominated by the two longest melodies of the piece, which accompany the characters on stage as all three finally dance together. The second of those tunes (shown above in Ex. 4.3) simply follows a pure melodic wave contour, the largest in the form. By contrast, the first charts a meandering melodic course which is not obviously derived from any earlier events. It could be argued that this lack of a precedent makes it the only truly ‘new’ idea in the work – quite a compositional feat on Debussy’s part, not to have required any unrelated material for over fifteen minutes! However, its novelty is set against a far more familiar accompanying texture, as shown in Ex. 4.18.

Ex. 4.18: Melodic Ramp

The score for Ex. 4.18 is annotated with several melodic and rhythmic features:

- Chromatic descent:** A short melodic fragment showing a descending chromatic scale.
- Whole-tone/Octave displacement:** A short melodic fragment showing a whole-tone scale with an octave displacement.
- Pentatonic movement (Tone/Minor 3rd):** A short melodic fragment showing a pentatonic scale with a tone and a minor third interval.
- Minor 3rd-descent/Semitone-ascent:** A short melodic fragment showing a minor third descent followed by a semitone ascent.
- Short-short-long:** A rhythmic pattern consisting of two short notes followed by a longer note.
- Hemiola (Various cross-rhythms):** A rhythmic pattern consisting of two groups of two eighth notes followed by a quarter note.
- Dotted Rhythm:** A rhythmic pattern consisting of a dotted quarter note followed by an eighth note.
- Semiquaver Triplets:** A rhythmic pattern consisting of three eighth notes beamed together.
- Melodic Arc:** A diagrammatic representation of a melodic arc, shown as a curve over a staff.
- Melodic Full wave:** A diagrammatic representation of a full melodic wave, shown as a sine wave over a staff.
- Melodic Ramp:** A diagrammatic representation of a melodic ramp, shown as a straight line over a staff.

After the two extended melodies (from bar 605 onwards), the section continues in a fragmentary manner, (mainly) juxtaposing four-bar blocks, defined by their motivic content. In each of those segments, various motifs are heard simultaneously, as demonstrated below (see Exx. 4.19&20).

Ex. 4.19:

The diagram illustrates the following motifs and their locations in the score:

- Chromatic descent**: A five-note descending scale (F#-E-D-C-B) shown in a single staff.
- Melodic Ramp**: A single note on a staff with a diagonal line through it, indicating a rising or falling pitch.
- Whole-tone/Octave displacement**: A five-note whole-tone scale (F#-G-A-B-C) shown in a single staff.
- Pentatonic movement (Tone/Minor 3rd)**: A five-note scale (F#-G-A-B-C) shown in a single staff.
- Minor 3rd-descent/Semitone-ascent**: A five-note scale (F#-E-D-C-B) shown in a single staff.
- Short-short-long**: A rhythmic pattern of three eighth notes (short, short, long) shown in a single staff.
- Hemiola (Various cross-rhythms)**: A rhythmic pattern of two eighth notes followed by a dotted quarter note, shown in a single staff.
- Dotted Rhythm**: A rhythmic pattern of a quarter note followed by a dotted quarter note, shown in a single staff.
- Semi-quaver Triplets**: A rhythmic pattern of three eighth notes beamed together, shown in a single staff.
- Melodic Arc**: A single note on a staff with a curved line above it, indicating a melodic contour.
- Melodic Full wave**: A single note on a staff with a full wave-like curve above it, indicating a complex melodic contour.

The central score snippet shows the following details:

- Bar 611**: The starting point of the analysis.
- Woodwind**: Includes parts for *Ob & Cor A* and *Bans*.
- Strings**: Includes parts for *arco, soutenu et marqué*, *sur la touche*, and *pizz.*

Ex. 4.20:

The image shows a musical score for Debussy's 'Prélude' (bars 645-650) with several annotations. The score is divided into sections for Woodwind (Fls., Ob. 2, Cls., Bsns.; Ob. 1, Cor A.), Brass (Hns.; Tbn.), and Strings (Vlins.; Vlas.; Vcs., Cbs.; pizz.). Annotations include:

- Chromatic descent**: A line of notes showing a descending chromatic scale.
- Melodic Ramp**: A line showing a continuous upward melodic slope.
- Melodic Arc**: A line showing a melodic curve that rises and then falls.
- Melodic Full wave**: A line showing a full wave-like melodic contour.
- Semiquaver Triplets**: A line of notes with a '3' over them, indicating a triplet of eighth notes.
- Dotted Rhythm**: A line of notes with a dotted rhythm pattern.
- Hemiola (Various cross-rhythms)**: A line of notes with a hemiola rhythm pattern.
- Whole-tone/Octave displacement**: A line of notes showing a whole-tone scale with an octave displacement.
- Pentatonic movement (Tone/Minor 3rd)**: A line of notes showing a pentatonic scale movement.
- Minor 3rd-descent/Semitone-ascent**: A line of notes showing a minor third descent followed by a semitone ascent.
- Short-short-long**: A line of notes showing a short-short-long rhythmic pattern.

Musically speaking, the short Postlude (from bar 689) frames the form. As a second tennis ball drops to the stage, earlier materials are heard again in relatively untransformed versions and are thus easily recognisable. The flute flourish from bar 70 is followed immediately by trilling violins (see Ex. 4.14, above), before *Prélude* material is used to end the work. As Wheeldon points out, this token recurrence hardly brings about a sense of overall balance, as it lasts for just eight of the 709 bars. She cites the return of the opening as a sign of a 'cultural lag', on account of which Debussy was compelled to 'book-end' his radically new form, in acknowledgement of older archetypes belonging to less-modern styles (Wheeldon, 2004: 108). Considered in terms of the motivic network, however, the re-hearing of earlier material makes explicit the process of reinventing older ideas. Just as a new perspective is offered on the scenario due to the implied presence of a voyeur with his or her second tennis ball,

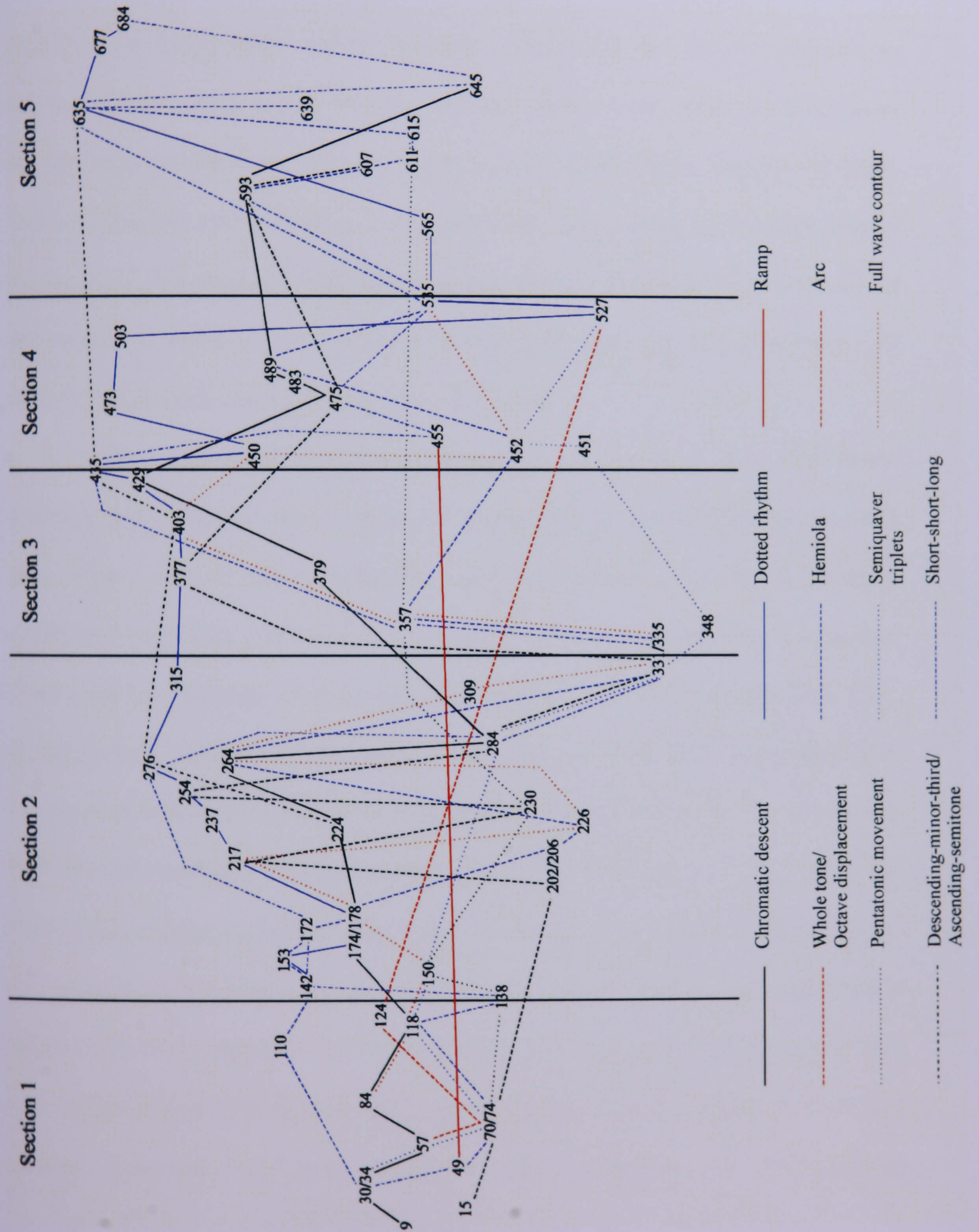
so this Postlude invites listeners to reassess previous events. Although they continually give rise to new and varied materials, fundamentally the same few events recur, just as in the alternating strokes of a game of tennis.

Motivic Network

Considered in its entirety, *Jeux* continually bombards listeners with information, offering them the opportunity to make many perceptual connections of many different kinds. In addition to the motivic and melodic activity discussed above, the piece might also be conceived in terms of timbral or tonal events, or in terms of its implications for the flow of time at different points. Unsurprisingly, therefore, the problem of hearing the piece as a whole, single form is similarly manifest in analysing it. Ultimately, because it might be heard in so many different ways, any single representation is bound to be less than comprehensive.

Ex. 4.21 is one attempt to convey the piece as a network of connections between motifs and melodic shapes. The numbers represent the bars in which new motifs or melodies occur, and on certain occasions they are presented in pairs, where significantly new materials are introduced in quick succession. The materials to which the numbers refer are set out in the Appendix. Broadly speaking, time flows from left to right. There is no implication attached to vertical positioning, and thus the diagram is in keeping with the unpredictable nature of this unfolding network, as events move in unexpected directions. Colours are used to represent different kinds of connection: black denotes particular intervallic patterns; blue, rhythmic configurations; and red, melodic shapes (all as named above in Exx. 4.16-20).

Ex. 4.21:



As explained above, there are more motivic elements in the work than the eleven shown; and further, certain of the intervallic configurations are ramps, arcs or waves in themselves. However, there are certain things which it does illustrate regarding the larger-scale motivic structure. Obviously, the network expands as materials are presented in new variants, and also, closer to the end of the form, there are far fewer connections; the piece gets simpler and simpler towards its close. Further, 'stronger' connections are presented in the third section, as materials exhibit combinations of a number of different elements. Overall, therefore, there is a build-up and release in terms of the implications associated with melodic perception; the motivic process as a whole takes the form of a wave.

Perhaps the most significant information uncovered in Ex. 4.20 is the existence within the network of particular focal points at which a number of chains meet. With a view to understanding the significance of these, it is worth reflecting briefly on tonal events which coincide at these moments. Ultimately, this is a network of the same few recurrent motivic and melodic ideas, continually resynthesised. Thus, the larger-scale, sustained relationships in this piece are based in its foreground. This represents a radical departure from traditional use of structural levels; whereas in more conventional pieces the background was defined by changes of pitch-collection prolonged over long periods of time, here the ever-changing nature of the surface is also reflected at that notionally 'deeper' level. Collection change – conventionally a background event – actually operates at a faster rate, one more normally associated with surface events. Perceptually, this challenges the listeners' sense of tonal and harmonic direction. Very rarely is there a clearly defined basis for expecting

imminent resolution to a particular centre: indeed, very rarely is the piece actually 'in a key'.

Correspondingly, when a centre is allowed to influence our expectation it gives rise to a feeling of temporal momentum and directionality. The piece is clearly centred on A[♯], which is clearly projected at the beginning (in bar 9, following the *Prélude*) and tentatively resolved to at the end. In between, there is a conventional move to the dominant, E, at bar 138, heralding the second section (as listed in the table above; see Ex. 4.4). Thereafter, projected tonal centres are typically whole-tone related to the tonic (for example, E^b in bar 357ff (*Joyeux*); bar 429, the dominant of E^b, which resolves enharmonically to D[♯]). Elsewhere, they are minor-third related to the tonic (for instance C[♯] at bar 309ff; G[♯] via its dominant at bar 331ff). Selective though these examples may be, they all imply a symmetrically-divided octave, and thus undermine any directional hierarchy of conventional tonal organisation. With tonality reduced to such a subsidiary role in terms of temporal implications, it is easy to see why the post-war avant garde was so attracted to this piece. Its network of motivic associations functions in a manner similar to moment form, in that form and content are continually reconstrued in relation to one another. What is surface becomes background and vice versa; everything and nothing is middleground. *Jeux* offers listeners multiple potential networks from a number of different perspectives, with no one underlying (or overarching) structure being more important than any other.

Chapter 5

Pointed Difference:

Opposition in *Requiem Canticles*

Requiem Canticles (1965-6) stands as a direct contrast to *Atmosphères*. Where Ligeti's fluid arch-form concerns extreme continuity within gradually transforming states, Stravinsky's discontinuous blocks are marked by bold contrasts. The passage of time in this piece is similarly unrelated to the ever-changing musical surface of *Jeux*. In the place of continual synthesis and varied repetition of the same few elemental ideas, sudden change and temporal dislocation – opposition – is the norm here. Indeed, the highly interruptive nature of this work presents a challenge to listeners' ability to perceive connections between events; it might even be cited as an *anti-network*. Typical of the Russian composer, the most important contradiction here perhaps rests with listener expectations. The energy which characterises the work from the outset is hardly what one might anticipate in a Requiem Mass: overall it seems to convey defiant restlessness in the face of death. Arguably, that vitality remains: over 40 years after their composition the *Canticles* still communicate with the immediacy and directness which was felt at the time.

Towards the end of Stravinsky's life something changed. He wrote a piece, his last grand piece of music, the *Requiem Canticles*. Though in it, he used the novel devices of serial technique, he somehow overpowered them. It was immediately, instinctively, totally loveable to me. I was able without any effort to penetrate into the essence of its tragic beauty. I was as fully taken and shaken by it as I used to be in the thirties and forties by every new composition by Stravinsky.

(Nabokov, quoted in Taruskin, 1996: 1649)

Whilst this highlights the instant impact of the work, Nabokov's comment betrays a particular critical agenda. After ultra-chromaticism had exhausted the resources of tonality, finding new means of pitch organisation was an important

challenge facing composers. At the risk of excessively reducing a richly diverse period of musical history, a division arose in the mid-twentieth century within European art-music culture between serialists and neo-classicists. As Paddison says, this was catalysed by Adorno's *Philosophie der neuen Musik* (Adorno, 1949), 'a dialectical reading of the New Music in the form of a critique of its two most extreme representatives, Schoenberg [serialism] and Stravinsky [neo-classicism]' (Paddison, 2003: 192). Although, it '...is certainly a crude simplification' (ibid: 193) to suggest that Adorno proposed a polarised view, the Schoenberg-Stravinsky rift was perceived as reflective of a fundamental difference in aesthetic. Followers of the Second Viennese School considered themselves to be progressive, forging a new path using serial techniques. Contrastingly, they saw neo-classical composers as reactionary, merely producing pastiches of older forms and styles and continuing to refer to the tonal system. These are loaded terms; such labels imply an ignorance of, or at least a refusal to address the challenges facing twentieth-century music on the part of Stravinsky and his followers. In turn, it might be said that the neo-classicists thought serialism unmusical and contrary to communication.

A fundamental part of the neo-classical aesthetic was to connect with audiences, rather than to alienate them using the 'novel devices of serial technique'. The use of familiar forms and styles provided listeners with a 'way in' to the music: having engaged listeners' perceptions, composers could play upon them, instead of challenging or indeed obstructing them with an unfamiliar system. The twelve-tone technique, with its fundamental premise based in pre-composition, imposed abstract rules in order to ensure atonality, itself an abstraction. As neo-classicists saw it, Schoenberg's system was cold and intellectual, needing to be 'understood' in order to be appreciated; with its emphasis on thought, they felt that serialism stood between

composers and their instinctual ‘message’ and, ultimately, between the music and the listener. Thus, Stravinsky’s adoption of serial technique in his *Cantata* (1954) seemed like a compositional U-turn. The arch neo-classicist had defected and, more importantly, turned his back to the audience.

In this context, the motivation behind Nabokov’s comment is clear: the implication is that in spite of its serial construction, *Requiem Canticles* communicates as effectively as the earlier, neo-classical works; there is no need to know where the notes come from in order to appreciate this music. Writing in the 1980s, free of the connotations of the neo-classical/serial divide, Walsh concurs.

When Stravinsky was catching hold of musical ideas like this ... he seemed to be able to catch them instinctively ... one wonders whether he returned to the piano ... while writing *Requiem Canticles* ... At any rate the underlying chordal ostinato of the Prelude, the ‘Dies Irae’ cry, the chords in the Interlude, the ‘Lacrimosa’ and above all the ‘Libera Me’, have both a family relationship with their many perfect fifths ... and suggest – knowing Stravinsky – a pianistic origin ... The serial bonding must be left as an esoteric aspect of these sonorities: a private concern of the composer in his workshop ... the lyrical outpouring of the ‘Lacrimosa’ may make its effect partly through the ... recurring intervals and pitches of the rotation cycle in the melody itself; but it can hardly have anything to do with the fact that the chords happen to be serial verticals of the same grid as the melody.

(Walsh, 1986: 275)

Many writers have discussed the pitch content of *Requiem Canticles*, due in part to its historical context, but also because that aspect of the work is of particular interest. Perhaps most fascinatingly, and in line with the thrust of both of the quotations above, the work seems to transcend serialism, communicating something above and beyond the patterns used in its construction. This is paradoxical, and typical of Stravinsky: just as the ‘tonality’ of earlier works such as *Symphony in C* (1940) is brought into question, this is a serial piece which does not sound serial. Nowadays, modern scholarship considers his move to serialism as part of a line of stylistic development, rather than a discontinuity in output. Effectively, he took a neo-classical approach, reinventing the technique from the inside, using it as a means to

his own ends and indeed turning it on its head. Indeed, although Straus points out that ‘while there is some truth in the old cliché that Stravinsky always sounds like Stravinsky, ...the late music does not, in fact, make much use of [his] traditional harmonic vocabulary’ (Straus, 2001: xiv), the inverse is also true: the composer’s underlying musical identity comes through despite its surface manifestation. In short, as with all the models, serialism is given a Stravinskian stamp. Some details of how this is achieved are discussed below, although this suggests that rather than a purely pitch-based, serial analysis of *Requiem Canticles*, perhaps consideration of familiar, Stravinskian aspects – a more neo-classical approach – might provide a better way in to the piece.

Stravinsky’s Requiem Canticles

Stravinsky was in his seventies when he adopted serialism (shortly after the death of Schoenberg), and it is impressive that so provocative a work as this was written by an 84-year-old man. It ends a long line of memorial pieces, traceable throughout the oeuvre, although particularly present in the final period (note that the *Introitus*, a setting of the opening section of the Requiem text, immediately precedes the *Canticles* in the output):

In Memoriam Dylan Thomas (1954)
Epitaphium (1959)
Double Canon (Raoul Dufy in Memoriam) (1959)
Variations (Aldous Huxley in Memoriam) (1963-4)
Elegy for J.F.K. (1964)
Introitus (T. S. Eliot in Memoriam) (1965).

Stopping short of claiming for Stravinsky a morbid obsession, he would have been extremely aware of the epitaphic implications of composing *Requiem Canticles*. At the top of the score is a dedication to Helen Buchanan Seeger, although as was intimated to Robert Craft by the composer's wife Vera, ' "he and we knew he was writing it for himself" ' (quoted in Taruskin, 1996: 1649). However, in line with the character of the work itself, the idea that these are in fact *Stravinsky's Requiem Canticles* goes far beyond the poignantly autobiographical. Keeping any hint of sentimentality out of the equation, this work bears his fingerprints through-and-through. Indeed, his influence can even be felt in the words.

The text of the work reflects the composer's dispositions towards subversion of function and fragmentation. The use of an ancient language – in this case Latin – is a Stravinskian trait in itself. Besides referential connotations of archaism, a major part of his attraction to it lay in its inability to signify to modern audiences:

The choice [of Latin] had the great advantage of giving me a medium not dead, but turned to stone and so monumentalized as to have become immune from all risk of vulgarization....

What a joy it is to compose music to a language of convention, almost of ritual, the very nature of which imposes a lofty dignity! One no longer feels dominated by the phrase, the literal meaning of the words... The text thus becomes purely phonetic material for the composer.

(Stravinsky, quoted in Copeland, 1982: 572)

In terms of communication there would seem to be no greater subversion of function: language itself is used to detract from meaning. Clearly, the intention is to focus the listener on the work as a musical composition rather than as a vehicle for presenting the text, which is in any case incomplete. Only parts of the Catholic Mass for the Dead are set, meaning that the work cannot be used in a functional setting in church but is intended as a concert piece. Of course, as well as serving as part of the liturgy, the Requiem is a musical tradition unto itself, encompassing many iconic works.

Rather than take the genre as a formal model, Stravinsky's comment comes as a set of *Canticles*: 'songs or chants with words taken from the Bible' (Hawkins, 1986: 127). Thus, a sacred text is taken from its original context, fragmented, and used for a new purpose; just as in the 'Russian' period, in the absence of a formal archetype, Stravinskian discontinuity is inherent at the precompositional stage. A further surface hint of neo-classicism remains, however, as there are references to Verdi's Requiem in the opening trumpets of the *Tuba mirum* and the chant-setting of the *Libera Me*.

Self-referential artwork

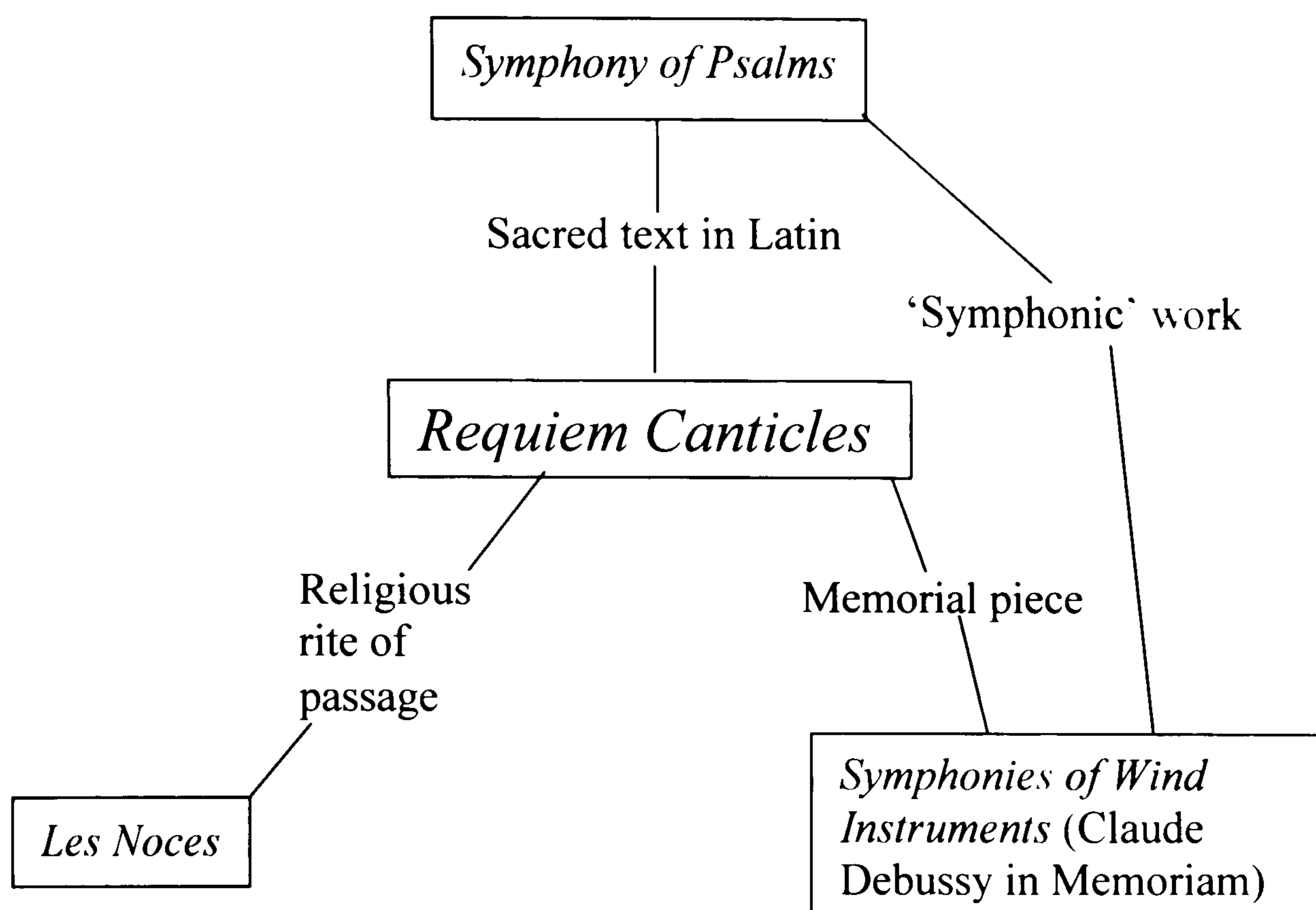
Besides referring to other composers, this last great masterpiece in a career spanning over fifty years makes reference to a number of earlier works by Stravinsky himself. Perhaps the most overt example is the 'quotation' from the *Symphony of Psalms* (1930) in the *Rex Tremendae*, as shown below in Exx. 5.1a&b.

Ex. 5.1a: *Symphony of Psalms*, Movt III: flutes and trombones, 3 bars before fig. 20

The musical score for Ex. 5.1a is presented in a multi-staff format. At the top left, the tempo is marked 'mosso, ♩ = 60'. At the top right, a box containing the number '20' indicates the start of a new section, with the tempo marked 'Tempo (♩ = 48) ♩ = 96'. The score includes parts for Flutes (Fl. gr.), Oboe (Obue), Clarinet in F (C-Fag.), Trumpets (Tr-ni), and Trombones (Tr-ne (basso)). The flute parts are marked 'subito p e secco'. The trumpet part is marked 'p, secco'. The oboe and trombone parts are marked 'mf cantabile' and 'p' respectively.

Ex. 5.1b: *Requiem Canticles, Rex Tremendae*: flutes and strings, bars 206-9

Other examples are more understated: block-like syllabic choral writing is also found in *Psalms*; the clear distinction between vertical and horizontal sonorities throughout the *Canticles*, although particularly in the *Interlude*, resonates with the *Symphonies of Wind Instruments* (1921). Of particular note, the temporally static chorale of the *Postlude* recalls the endings of both of these symphonic works as well as *Les Noces* (1923). Perhaps these examples are merely stylistic features, rather than overt references; as testament to the distinctiveness of his musical lexicon, both are recognisably Stravinskian sonorities and procedures. Indeed, Straus writes an entire chapter on the expressive value of these and other compositional traits and devices (Straus, 2001: 183-248). In this instance, it should suffice to point out that there are significant links between the geneses of these pieces, as shown diagrammatically in Ex. 5.2.

Ex. 5.2:

Each has connotations of a rite of passage. At the end of his life-cycle the composer evokes both marriage and death (perhaps even preceded by birth, as there is something of *The Augurs of Spring* in the opening ostinato of the *Canticles*). It is pleasing to infer such analogies, although there is a more important musical link between these quasi-religious works, the presence of 'ritual'. Since examples of such musical procedures can be observed in a great deal of Stravinsky's music, it is perhaps worth a short digression to consider the implications.

Psalms: ritual repetition

- Ritual:**
1. the series of actions used in a religious or other rite
 2. a procedure regularly followed

(Hawkins, 1986: 710)

Broadly speaking, the notion of ritual as found in Stravinsky's music implies repetition patterns, a fundamental part of his style. Of course, the matter is not quite

that simple: a great deal of music is repetitious yet completely down-to-earth (*Jeux* being one example). Importantly, there is something about the way in which things recur in his music which lends certain passages a transcendental quality: listeners' perceptions of time are suspended – a vital part of any distinction between ritual and normal repetition. Perhaps the most oft-cited example in the output comes at the end of the *Symphony of Psalms*, as shown overleaf.

Listener expectations are completely subverted in this passage, to amazing effect. Heard in the context of greatly heightened tension, and forming the climax of the work as a whole, this music is immediately preceded by a massive increase in tessitura and a concurrent crescendo, sustained over six bars. Therefore, one might expect the sudden drop in tempo and dynamic to be a deflating, unsatisfactory experience. However, a large part of the expressive power of this coda is that having created a state of arousal, this contrast serves to focus listeners' attention. This in itself brings about a ritual-esque 'higher state of consciousness' as listeners are far more alert to their perceptions than normal. However, the sense of ritual also derives from the nature of events following the point of (non-)climax: having been brought to the foreground, perceptions are manipulated.

Ex. 5.3: Symphony of Psalms, Movt. III, fig. 22f

22 *Molto meno mosso, ♩ = 72 rigorosamente*

Fl. gr. 1, 2, 3, 4

Oboi 1, 2, 3, 4

C.I. 1, 2, 3, 4

Fag. 1, 2, 3

C-Fag. 1, 2, 3, 4

Cor. 1, 2, 3, 4

Tr-ba picc. Re 1, 2, 3, 4

Tr-be Do 1, 2, 3, 4

Tr-ni 1, 2

Tr-ne (basso) e Tuba 1, 2, 3, 4

Timp.

S. *p subito e ben cantabile*
 cor. dis et or. ga. no; Lau. da. te E. um in cym. balis, be. ne. so. nan. ti. bus,

A. *p subito*
 da. te E. um; Lau. da. te E. um in cym. balis, be. ne. so. nan. ti. bus,

T. *p subito*
 cor. dis et or. ga. no; Lau. da. te E. um in cym. balis, be. ne. so. nan. ti. bus,

B. *p subito*
 lau. da. te, lau. da. te; Lau. da. te E. um in cym. balis, be. ne. so. nan. ti. bus,

Arpa *mf*
 8^a bassa

P-f. 1, 2 *p*
 a 2
 8^a bassa

V-C. div. a 3 *cant. ma non f*

C-B. *crescendo*

Essentially, the ritualistic nature here derives from the interlocking rhythms – a four-note cycle in the piano, harp, and timpani, and recurrent 3/2 patterns in the rest of the ensemble – which shift in and out of phase with each other. This is transcendental in itself; by implication, materials cannot be contained by the time signature or phrase structure. (However, that is not to say that every cross-rhythm has some kind of mystical significance!) Something that distinguishes this passage and makes it so typically Stravinskian is the economy of materials: no part contains more than four pitches. This has at least two implications. Firstly it results in disconnection and separation within the ensemble since no materials are shared by more than one part, within each ‘choir’ (of voices, trumpets and ‘celli). Thus, albeit they merge together to form a background sonority, each part follows an individual pattern unaffected by its surroundings. Secondly, the restriction of materials within those patterns greatly increases the frequency, and indeed the potency (the overall impression), of internal repetition within each pattern. This results in a feeling that the flow of time is somehow suspended: recurrence denotes temporal stasis, and simultaneously, phase-shifting implies movement and change. As patterns coincide in different ways at different times, so things that are ‘fixed’ become ever-changing. Thus, the ritualistic nature of the passage lies in paradox: regimented repetition – temporal constraint – is precisely what liberates this music from time.

Canticles: ritual opposition

Despite various similarities, *Requiem Canticles* is fundamentally different from the *Symphony of Psalms*. The kind of repetition discussed above is in fact directly opposed to serial thinking, which has linear motion at its core: non-repetition is inherent in, indeed a fundamental condition for, a twelve-tone row. Arguably,

however, the presence of ritual can be felt in the work although it is manifest in ways other than purely in terms of pitch content. As Cross says, 'it is striking that in Stravinsky's most ritualistic works – *The Rite of Spring*, *Les Noces*, *Symphony of Psalms*, *Mass*, *Threni* – he invents block structures which place a primacy on opposition, discontinuity, non-development' (Cross, 1998: 61). In *Requiem Canticles*, as in various other late works, that formal conception is apparent even in the presentation of the score. Ex. 5.4 shows the opening of the *Exaudi*.

Ex. 5.4:

EXAUDI
♩ = 104 (♩ = 52)

The score for the opening of the *Exaudi* section is presented in a block structure. It includes the following parts and markings:

- Fl. gr. I:** Treble clef, starting with a half note G4, marked *accent in p*.
- Arpa:** Bass clef, starting with a half note G2, marked *5/8 accent in p* and *sempre marc.*
- Fag. I & II:** Bass clef, marked *4/4 accent in p*.
- Coro:** Soprani, Alti, and Tenori parts, all marked *p*. The lyrics are "Ex - au - di,".
- VI. I & II:** Treble clef, marked *p harm.*
- Vle.:** Treble clef, marked *p*.
- Vc. div.:** Treble clef, marked *p harm.*
- Cb.:** Bass clef, marked *(loco)*.

Vertical dashed lines connect the first notes of the Flute I, Arpa, Fagotti, and Coro parts, highlighting their simultaneous entry.

It is as though chunks of sound have been cut out and stuck in next to each other: even the physical act of composing has a ritual element. Notably, each one is characterised principally by its timbral and textural content: each presents a particular bold colour, strongly contrasted with surrounding materials. This plays an important role in the immediacy with which the score communicates, since each instant is intensely identifiable as itself. As a corollary, the sense of an underlying process – connections between the blocks – is weakened, since, as discussed with reference to *Atmosphères*, timbral change cannot bring about temporal implication.

Effectively, listeners are presented with objects which are unified internally and opposed to the others around them – a network in which the points do not connect. In fact, Stravinsky pioneered this montage approach in the composition of *Symphonies of Wind Instruments*, which Kramer identifies as a kind of early moment form (Kramer, 1978: 184-8). Stravinskian discontinuity is superficially far less extreme than that found in *Kontakte* however, since the basis for difference is itself on a different level. In the Stockhausen, the principle basis for distinguishing between sounds might change from one moment to the next, from timbral activity to pitch for example, and then to durational characteristics, and so on. The contrasts in *Requiem Canticles*, however, are nothing like on the scale required to bring about such changes in perceptual perspective.

The materials in *Requiem Canticles* can actually be considered to be more starkly contrasted than those in *Kontakte*. Stockhausen's title itself places an emphasis on connections between dimensions, where in the Stravinsky each parameter provides an underlying framework for relationships. Albeit certain of the blocks are more distinctive than others in terms of their pitch content, they are all governed by a unifying factor, the series. Similarly, the timbral element is tightly contained. An

important means by which sonorities are made so distinctive is the restricted use of very few clearly contrasted colours in each movement, and those timbres are not transformed to the extent that they begin to merge with each other, let alone with pitch or rhythm. Like the blocks themselves, the dimensions which define them remain separate and can be perceived throughout. Thus, there are consistent bases for comparison. Events take their place along axes of timbre, rhythm and pitch, although they are situated so far apart that the relationships between them are remarkably disconnected.

This kind of heightened discontinuity creates a sense of abstraction, since listeners are both denied a means of understanding why particular events should follow each other and simultaneously allowed to know that they are comparable. Thus, there is an implication of an underlying network which contains the blocks, although one which is hidden. Perhaps this explains why stark oppositions are so prevalent in Stravinsky's more ritualistic works, since it implies that the music transcends 'understanding'. As in religious rituals, rather than conveying a 'meaning' per se, sets of actions convey the existence of something which cannot be grasped.

Global form

The air of ritual in *Requiem Canticles* is particularly intense because of its overall formal organisation. The nine movements form a symmetrical pattern, comprising two groups of three settings of text, framed and punctuated by an instrumental *Prelude*, *Interlude* and *Postlude* (see below).

Ex. 5.5:

<u>Prelude</u> Strings	<u>Exaudi</u> Chorus and Orchestra (Fls., Bsns., Hn., Strings)	<u>Dies Irae</u> Chorus and Orchestra (Fls., Strings, Brass, Percussion)	<u>Tuba Mirum</u> Bass solo (with Trumpets and Bassoons)	<u>Interlude</u> Woodwinds (+ Horns) with Timpani	<u>Rex Tremendae</u> Chorus and Orchestra (Fls., Brass, Strings)	<u>Lacrimosa</u> Contralto solo (with Flutes, Strings and Trombones)	<u>Libera Me</u> Soloists with Horns and Chorus (<i>Parlando</i>)	<u>Postlude</u> Percussion (with Flutes and Harp)
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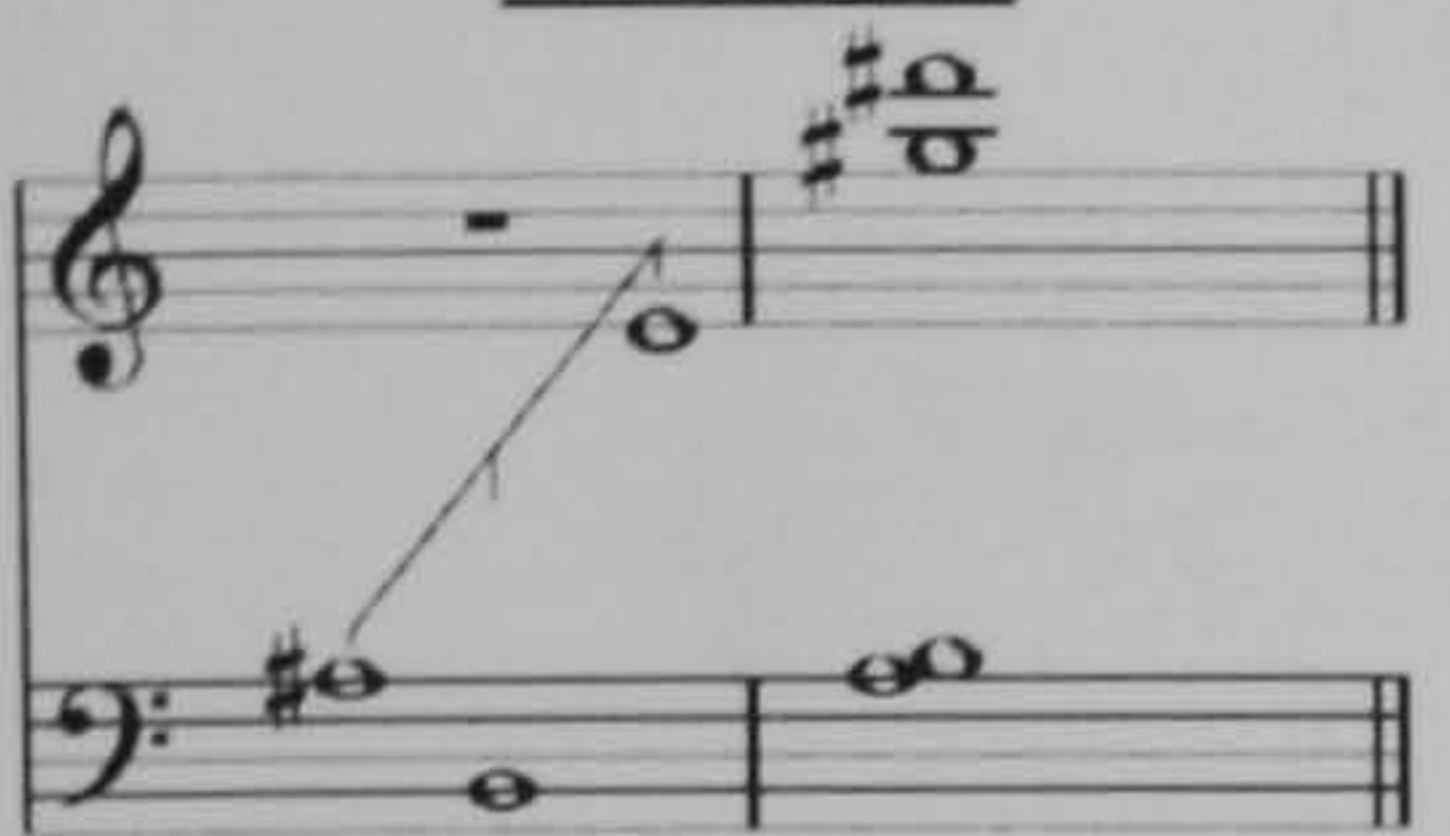
The texts in movements 2-4 and 6-8 are respectively different in tone, the first set being prophecies of the day of judgement, the second being appeals to God for salvation. However, as explained above, textual meanings are of secondary importance here. Primarily, formal balance and completion are conceived according to timbre: the inner 'trptychs' both have two canticles for chorus and one for each of the male and female soloists, and the *Prelude*, *Interlude* and *Postlude* use all three sections of the orchestra (strings, wind and brass, and percussion instruments) in turn. This implies timbral opposition on two structural levels, both between movements as wholes and, as in the *Exaudi* example above, between their internal blocks. However, given the abrupt discontinuities, it is unclear to the listener how events at the lower level subscribe to larger-scale shapes. Consequently, within that isolated hierarchy, the beginnings and ends of movements take on added importance, since they open and close global structural activity. At each of those points an intervallic shape is projected, revealing a reference to (Stravinskian) tonality on the large scale as explained below.

Ex. 5.6:

1. Prelude



2. Exaudi



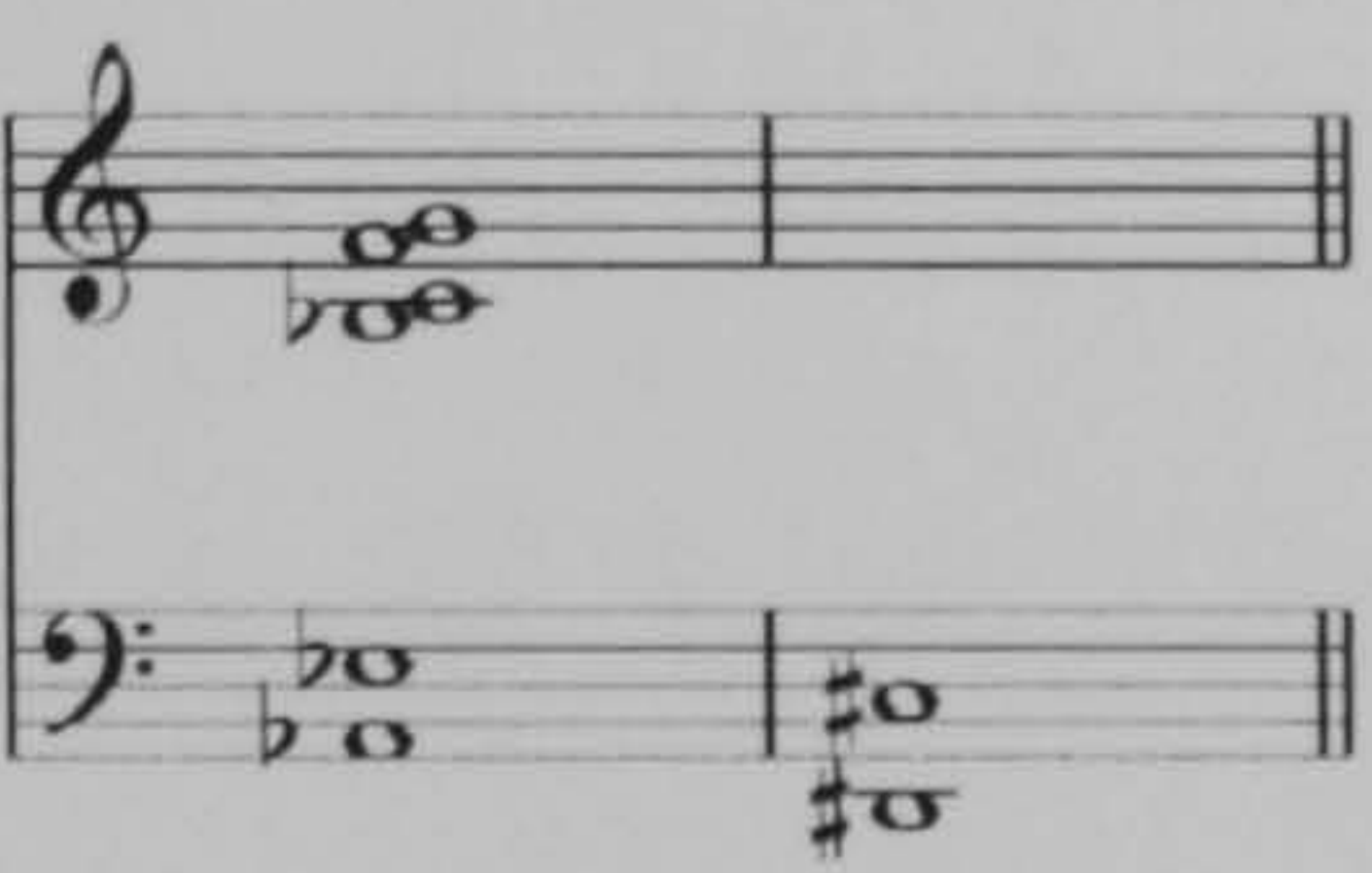
3. Dies Irae



4. Tuba Mirum



5. Interlude



6. Rex Tremendae



7. Lacrimosa



8. Libera Me



9. Postlude



In the first three movements different inversions of an intervallic cell, a perfect fifth enclosing a semitone, are prominent in the opening and closing sonorities, whilst at the end of the *Tuba mirum* a different shape is projected. At the start of that movement, this recurrent cell is reordered as A-D-E^b, a tritone enclosing a perfect fourth, whilst at the end, the notes G[#]-B[#]-C[#] form a perfect fourth enclosing a semitone. Gradually therefore, the prominent shape at structurally significant points is reduced in compass. Effectively, whilst maintaining its characteristic profile of a semitone contained within a larger interval, it is 'softened', becoming increasingly less dissonant. That transformation continues in the Interlude, where the opening

chord is built out of superimposed fifths, resulting in a diatonic/pentatonic sonority, as shown below.

Ex. 5.7:

(Tuba Mirum) (Interlude)

Semitonal/tritonal
'Hard' dissonance → Diatonic
'Soft' consonance

In the second half of the form this newly found sense of diatonic reference is made more prominent, as there are more explicit tonal implications at significant points. References to tonic and dominant functionality abound: harmonic centres of $G^\sharp(A^\flat)$ are found at the beginnings of both the *Interlude* and the *Rex Tremendae*, and both movements end with dominant 7^{th} -like sonorities centred on D^\sharp . Similarly, the *Libera Me* projects centrality on C at its opening and close, where F might be considered to act as tonic to that referential dominant in the *Postlude*. The opening chord of the *Lacrimosa* is particularly interesting: an octatonic aggregate (containing various perfect-fifth/semitone and tritone/perfect-fourth combinations) with B in the bass, that pitch standing in semitonal and tritonal relations to C and F respectively, as projected by the two final movements.

The significance of this interval-spotting lies in the perceptual values attached to perfect fourths and fifths as presented in serialism and in tonality. Theoretically, in dodecaphonic music their significance is of equivalent value: $C-G = G-C$. By contrast, in the tonal system they are inversions of one another: $C-G \neq G-C$, meaning that they have different harmonic and temporal implications. Where fifths constitute stability, fourths require resolution. This is clearly exploited in *Requiem Canticles*. Stravinsky

uses those intervals in a markedly anti-(Viennese)-serial way, since, as explained above, the same intervallic cell is presented in various conjugations, each time teasing out tonal implications in a different way. It is clear that this kind of tonal thinking is fundamental to the overall conception of the global pitch structure (see Ex. 5.8).

Ex. 5.8:

1. Prelude	2. Dies Irae	3. Exaudi	4. Tuba Mirum	5. Interlude	6. Rex Tremendae	7. Lacrimosa	8. Libera Me	9. Postlude
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The musical notation consists of two staves. The top staff shows a sequence of notes across nine measures, with brackets indicating intervallic cells. The bottom staff shows a similar sequence of notes with brackets.

Of course pitch organisation is not actually tonal here; the present intention is certainly not to make a case for '*Requiem Canticles in F*', albeit centrality on that pitch has particular funerary connotations in Stravinsky's late output (Straus, 2001: 202-8). Since this music proceeds on the basis of discontinuity rather than gradual transformative processes, it is not clear how surface harmonic events relate to globally significant ones. However, even in a work built out of isolated events, such high-level relationships are surely significant in that they articulate lower-level shapes at structurally important points, suggesting an ongoing competition between underlying serial and tonal networks. Furthermore, that the final three movements form a conventional tonal move towards F suggests that it is pertinent to investigate the manner in which this serial reference to tonality is brought about.

Pitch Organisation: a Stravinskian Spin on Serialism

Schoenberg devised serialism in order to ensure harmonic consistency and create unity in atonal music. Theoretically, using a totally chromatic note-row to generate materials, no single pitch has authority over any other. Further, by exploiting the characteristics of the row to guide compositional decisions, the resultant global structure ought in some way to reflect the characteristics of that germinal cell. Thus, Viennese strictly serial music is conceived from the bottom up: a single pre-compositional germ is reflected in activity at higher levels. By contrast, throughout his career Stravinsky was preoccupied with formal considerations. The Russian period is characterized by block-like discontinuity, and many of the Neo-classical works make comments on structural models. Unsurprisingly, therefore, his serialism is characterised by the imposition of compositional agendas 'from the top down'. In *Requiem Canticles* two rows are used to make strong tonal references; to achieve consistently atonal unity in accordance with a single series was not chief among Stravinsky's concerns in reinterpreting this tradition. Indeed, it could be argued that the opposition between the two rows is fundamental to his conception. The two prime forms are shown below, numbered in accordance with 'Some Notes on Stravinsky's Requiem Settings' (Spies, 1967: 98-123), although they are used in reverse order in the work. Both rows are divided into two halves in order to facilitate hexachordal rotation. That technique is explained below, although prior to that it is worth discussing how certain features of the series themselves might potentially affect the listening experience.

Ex. 5.9:

The image displays two musical series, Series 1 and Series 2, in treble clef. Series 1 is labeled with p^a and p^b above the staff. A bracket under the first six notes of Series 1 is labeled '(Perfect 5th)'. Below Series 1, two staves are labeled 'Octatonic Potential', showing the first six notes of the series in two different octaves. Series 2 is also labeled with p^a and p^b above the staff. A bracket under the first six notes of Series 2 is labeled 'Perfect 4th (- Perfect 5th)'. Below Series 2, two staves are labeled 'Tonal Potential', showing the first six notes of the series in two different octaves. Lines connect the 'Perfect 5th' bracket in Series 1 to the 'Octatonic Potential' staves, and the 'Perfect 4th (- Perfect 5th)' bracket in Series 2 to the 'Tonal Potential' staves.

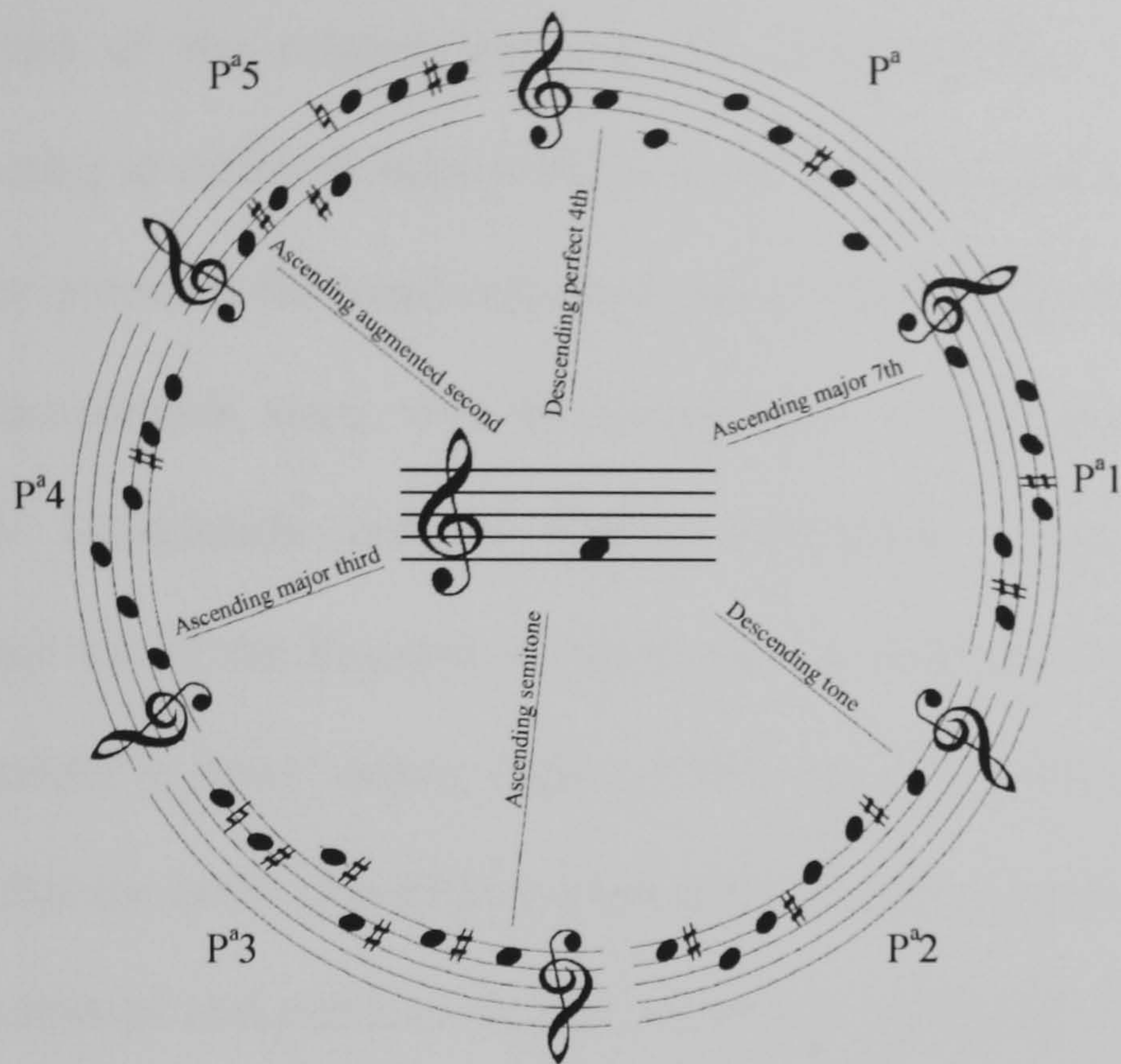
Allowing for inversions, both rows consist largely of tones or semitones. This invests a strong octatonic character in series 1, as marked, which contributes in no small measure to the Russian feel of the work (Taruskin, 1996:1659-61). In the context of those small intervals, larger ones are elevated to prominence. All four hexachords contain a perfect fourth or fifth; and, particularly importantly, both series contain the cell of a perfect-fifth/semitone, or tritone/perfect-fourth. As demonstrated above, this becomes a defining characteristic, placed in various inversions at structurally important points in the score. It is significant that those particular intervals constitute this cell, since they are tonally-defining; perfect fifths, tritones and semitones are precisely the elements which confirm or undermine the authority of a given key. Thus, reference is made to a fundamental tenet of tonality – the notion that certain intervals carry more structural importance than others – whilst that system in no way governs the behaviour of pitch. Although ‘tonally stable’ fifths are used as perceptual markers, there is no tonal infra-structure in place to imbue them with harmonic gravity. In this serial context they are powerless to attract resolution. Rather, that interval forms an anchor around which other pitches float. It has in-built structural weight relative to the rest of the series since, as it recurs, so does its distinctiveness, in an otherwise largely consistent medium of smaller intervals.

That consistency is controlled by the rotation technique used here. Although almost synonymous with Stravinskian serialism, it has precedents in Josef Hauer's 'tropes' (Lanksy and Perle, 2001: 1) and in the music of Ernst Krenek (ibid: 9). Firstly the twelve-note prime form is cut in half to produce two hexachords, P^a0 and P^b0 . Each provides the composer with six pitches, and more importantly with a particular sequence of intervals, which is used to generate five alternate hexachords, P^a1-5 . Taking P^a0 of series 2 as an example, the pattern is as follows:

Descending perfect fourth
 Ascending major seventh
 Descending tone
 Ascending semitone
 Ascending major third
 Ascending augmented second

Perhaps the clearest way of explaining this process is by analogy. The intervals might be thought of as spokes on a wheel, with the first pitch of the prime, F, at its centre. The wheel comes to rest in five alternate orientations (P^a1-5), each with a different spoke at the top. For each hexachord a different interval initiates the route taken through pitch space, which subsequently follows the circular pattern shown above. This is illustrated more clearly in the diagram below.

Ex. 5.10:



This process is applied to both hexachords in the Retrograde, Inversion, and Inverted Retrograde forms of the series, in order to produce a pitch array. That for series 2 is shown below (taken from Spies, 1967: 235).

Ex. 5.11:

Series 2

The musical notation for Series 2 is presented in two systems, each with five staves. The first system shows the original series: P^a, b, R^a, b. The second system shows the inverted retrograde form: I^a, b, IR^a, b. The notes are arranged in a way that demonstrates the pitch array for each form.

On account of the rotation process, the characteristics of the series are multiplied, occurring at different transposition levels in each hexachord. In particular, this increases the potential for tonal reference: the perfect-fifth/semitone cell recurs; each group of hexachords starts with the same pitch; and, as marked by Spies, a number of the hexachords contain triadic formations. More details of the characteristics and use of the *Requiem Canticles* arrays, and some of the implications thereof are discussed in Spies' article (Spies, 1967: 107-12; 118-23). Presently, what is important is that the array generates a great deal of precompositional potential for intervallic relationships and patterns. In fact, rather than devising a single, consistent and systematic means of using the arrays, their characteristics are exploited in a number of different ways, for example, using the vertical sonorities, or superimposing the P, I, R and IR forms (see Straus: 141-182). Effectively, in creating such row charts, Stravinsky provides himself with compositional room for manoeuvre. In distributing pitch content about the musical surface, the composer has a number of options, the internal coherence of which can be taken for granted:

For the most part, Stravinsky conceived his serial music in terms of independent lines, each with its own internal serial and musical logic, which could then be combined in polyphonic layers.

(Straus, 2001: 61).

Even when the music seems most abstract, most reliant on intricate precompositional schemes, Stravinsky always worked out the details at the piano, in constant physical contact with the tactile and acoustical realities of the sounds he was writing.

(ibid: 49)

It was particularly important to Stravinsky that his music should be constructed in strict accordance with the series: corrections to his 'serial mistakes' are well documented (Straus, 1991; 1999; 2001: 71-7). However, his approach to the technique means that within self-imposed limits, compositional decisions are guided by his taste and intuition. In imposing his agenda from the top down, the composer is

in control of serialism, rather than the other way around. Naturally, serial technique has many consequences for pitch organisation and resulting implications for the manner in which information is imparted to listeners.

Although row forms are used in full at various points during the work, a particularly significant difference with dodecaphony is that the 'fundamental unit' (hexachordal combinations) consists of only half as many pitches. In theory, this would seem to imply coherence on a smaller scale and thus a greater degree of immediacy, since the switch from one hexachord to the next occurs at double the frequency of that between row forms. Further, characteristic combinations of intervals are twice as distinct within a six-note construction as in the total chromatic. Perfect fourths/fifths have twice the tonal implication here than in the context of a twelve-tone row.

Moving away from theoretical speculation and towards practical realisation, there are inevitable consequences of such preparatory work for the musical surface. The most significant link between precompositional and compositional activity lies in the notion of disconnection. Effectively, a serial array divides pitch space into groups of readily separated blocks, each containing the same pattern of intervals. Thus, Stravinskian discontinuity and recurrence – ritual characteristics – are fundamental to the conception of *Requiem Canticles*, having occurred even before a single note was written. Similarly, these features are essential to the perception of this work, so strongly characterised by opposition from the very outset.

The Prelude and the 'Iceberg' Effect

The opening bars establish an opposition between soloists and orchestra which runs throughout this first movement, manifest both on the small and the large-scale.

Ex. 5.12:

PRELUDE
Tutte semicrome eguale, $\text{♩} = 250$

VI. Solo $\frac{2}{8} = \frac{5}{16}$ $\text{♩} = 250$
più *f* che gli altri Vini.

VI. I $\frac{5}{16}$ *non f ma ben marc.*

VI. II $\frac{7}{16}$ *non f ma ben marc.*

VIc. $\frac{5}{16}$ *non f ma ben marc.*

Violoncelli: $\frac{5}{16}$ *non f ma ben marc.*

It is expressed most immediately in terms of texture: the insistent ripieno 'ostinati' are strongly contrasted with the shaped, melodic lines of the first violin. Further, there is tension in the rhythmic organisation of those two forces; effectively, the solo violin enters at a different tempo, its cross-rhythm dividing the bar in half, rather than locking into the 5/16 time signature imposed by the orchestra. As a whole, the movement comprises four refrains of which this is the first, and in each of those formal segments a further solo line is added to the texture. Interestingly, that inherently open-ended process of accumulation is counterbalanced by closed symmetry in the orchestral parts. Over the course of the *Prelude*, the orchestra sounds the prime followed by its retrograde: the entire series played forwards, and then backwards. That serial mirror is also reflected in the registral distribution of pitches, which form a sequence of arches overall (see Ex 5.13).

Ex. 5.13:

P^a b R^a b

* *

Bar 5 10 15 20 25 35 (47)

Accompaniment Pitches

Overall contour

* Pitch missing from accompaniment, although included in Soloists' parts

As an example of how the composer controls his technique rather than vice versa, clearly this inherently serial shape is not intended to be perceived. As shown, within each refrain the emphasis in the orchestral parts is on the initial rise in pitch, which is vastly out of proportion with the subsequent fall. Rather than balanced arches, listeners experience a succession of ramps, adding to the overall sense of formal momentum and accumulation (again, this is apparent even in the presentation of the score; see Ex. 5.12). In between these registral ascents, the soloists demand attention. As well as being marked 'louder than' the orchestra, their parts provide the more-interesting, changing element, each superimposing a different hexachordal layer. As such, the series itself is never actually stated in such a way that it might be recognised as a whole, let alone as the pattern from which the rest of the pitch content is generated. Thus, listeners are not explicitly offered the opportunity to understand how global intervallic coherence is achieved; the network which governs pitch events, and indeed contains the form, is concealed.

In line with the frozen nature of time, there is a kind of 'iceberg effect' here. Although everything is an integral part of an underlying network – the array – as hexachords and other combinations are used to fill the blocks of the form, listeners can only observe events which are apparent at the surface. Thus, the listening process is not so much one of making connections between events separated in time as of focusing the attention on immediate, local relationships. A number of potential networks – tonal, serial, octatonic – are implied, although none are fully subscribed to, since underlying connections are kept from view.

Iceberg effect I: tonal potential

The possibility of tonal reference within series 2 is made explicit at the very outset (see Ex. 5.12), as the movement opens with a repeated F in the 'celli, followed by the C a perfect fifth above in the violas. As the refrain progresses, a number of potential keys are hinted at fleetingly. The first four pitches of the ostinato, F-C-B-A, contain elements belonging to F major, as well as C major, A minor and D minor. Thus, when the soloist enters, repeating the movement from A[♯] (B[♭]) to C, those two notes might potentially act as the fourth and fifth to F, a flattened seventh and octave to C, or a flattened second and minor third to A (as part of an octatonic collection). Regarding the serial derivation of the pitches, the soloist sounds P^{b5} against the orchestra's P^{a1}. Notably, these are taken from different halves of series 2, meaning that they contain different sets of intervals.

The overriding perceptual effect of this passage, however, is not serial, but tonal: a shift from F as a harmonic centre to its relative D, albeit on a highly local scale. At the end of the phrase, after the first and second violins have 'cadenced' from A to D in bar 6, the soloist sounds D-A-G-C[♯]: an explicit reference to that dominant-

tonic relationship, effectively followed by a partial arpeggiation of the dominant seventh in D. Of course, none of these actually apply; this is not functionally tonal music; and besides, this being the very opening, sounds are not heard relative to a prevailing harmonic context. However, this is perhaps as clear an example of how the tonal reference (denies) functions as can be found in the work. As the movement continues, the relationship between the lines of the soloists and the ostinati is not nearly as explicitly implicative; as the orchestra works its way through the series, it projects continually changing centres and complexes. However, the reiteration by the soloists of the same materials in each refrain gives rise to significant interactions between them.

Iceberg effect II: (semi-)tonal friction

The two solo violin parts for the second refrain (bars 26-34) are shown below:

Ex. 5.14:

The hexachords are marked: the use of the term 'garbled' is taken from Payne, who says with reference to the second violin line that it 'moves from 0-F [Pa0] to a garbled R-F [Ra0/Rb0] (the note order is 4, 5, 6, 7, 3, with 1 and 2 accounted for in

the accompaniment as it stood at the first statement)' (Payne, 1967: 12). The semitonal nature of the opposition between the two is obvious, as initially their two-note 'stutter' figures interlock as they fight for dominance of the minor-third space between A and C[♯]. At bar 15, however, as the first violin arpeggiates the dominant seventh of D, the materials change as the instruments 'swap' positions: the second violin has the A[♯] previously played by the first, who in turn sounds A[♯], up to that point strictly the property of the second violin. Thereafter, they resume their semitonal opposition, albeit that the two crucial pitches – D and C[♯] – are separated by an octave, again only to swap positions, as shown in the diagram. This has a number of potential harmonic implications, although they are far weaker than in the opening phrase. As in the first refrain, there is a harmonic shift from A to D, although this time each of those centres forms part of a semitonal opposition and there is no obvious relationship with the orchestral ostinato (which sounds G, changing to E at bar 15). As well as this, it is significant that both violins have equal weight in dividing the minor third A-C into two interlocking whole-tones a semitone apart; that intervallic environment lends the passage a certain octatonic flavour, which intensifies as the movement progresses.

Iceberg effect III: proliferate potential

In the fourth refrain, a number of direct pitch relationships are in evidence. Perhaps most significantly, the lines of the soloists correspond to the pitches of the orchestral ostinato to a far greater extent than previously (see Ex. 5.15). (The third refrain is not discussed here since the viola part, added at that point, is reiterated in this final passage.)

Ex. 5.15:

The musical score for Ex. 5.15 is divided into three main sections. The top section features five solo parts: Solo Violin I, Solo Violin II, Solo Viola, Solo Violoncello, and Solo Contrabass. These parts are characterized by intricate melodic lines with frequent triplets and slurs. The middle section shows the Violin I, Violin II, and Viola parts, which consist of dense, rhythmic patterns of eighth notes. The bottom section includes the Ripieno section and five solo parts: (Solo Vln. I), (Solo Vln. II), (Solo Vla.), and (Solo Vc.). This section is highly interconnected, with a complex web of lines indicating the relationships and interactions between the soloists and the ripieno section across several measures.

As shown, these eight bars are highly interconnected, and again the soloists change positions relative to one another so as to 'swap' harmonic centres. However, the sheer volume and rapidly shifting nature of these interactions actually serves to conceal them from listeners; in the context of so much changing so quickly, it is difficult to

perceive any ongoing relationships. In addition, the solo 'cello and double bass add another layer of perceptual interference, one which ensures chromatic saturation (their line includes every pitch except for B^b, which is in the second violin). Thus, although manifold relationships are presented, listeners are prevented from hearing them. This begs the question of what listeners *are* able to perceive in terms of these pitches: how they might construct a network for themselves.

One answer to that question can be arrived at by taking a perspective on changes in the overall harmonic environment. In accordance with Ex. 5.16, there are two important points at which the total pitch content subscribes to particular underlying frameworks.

Ex. 5.16:

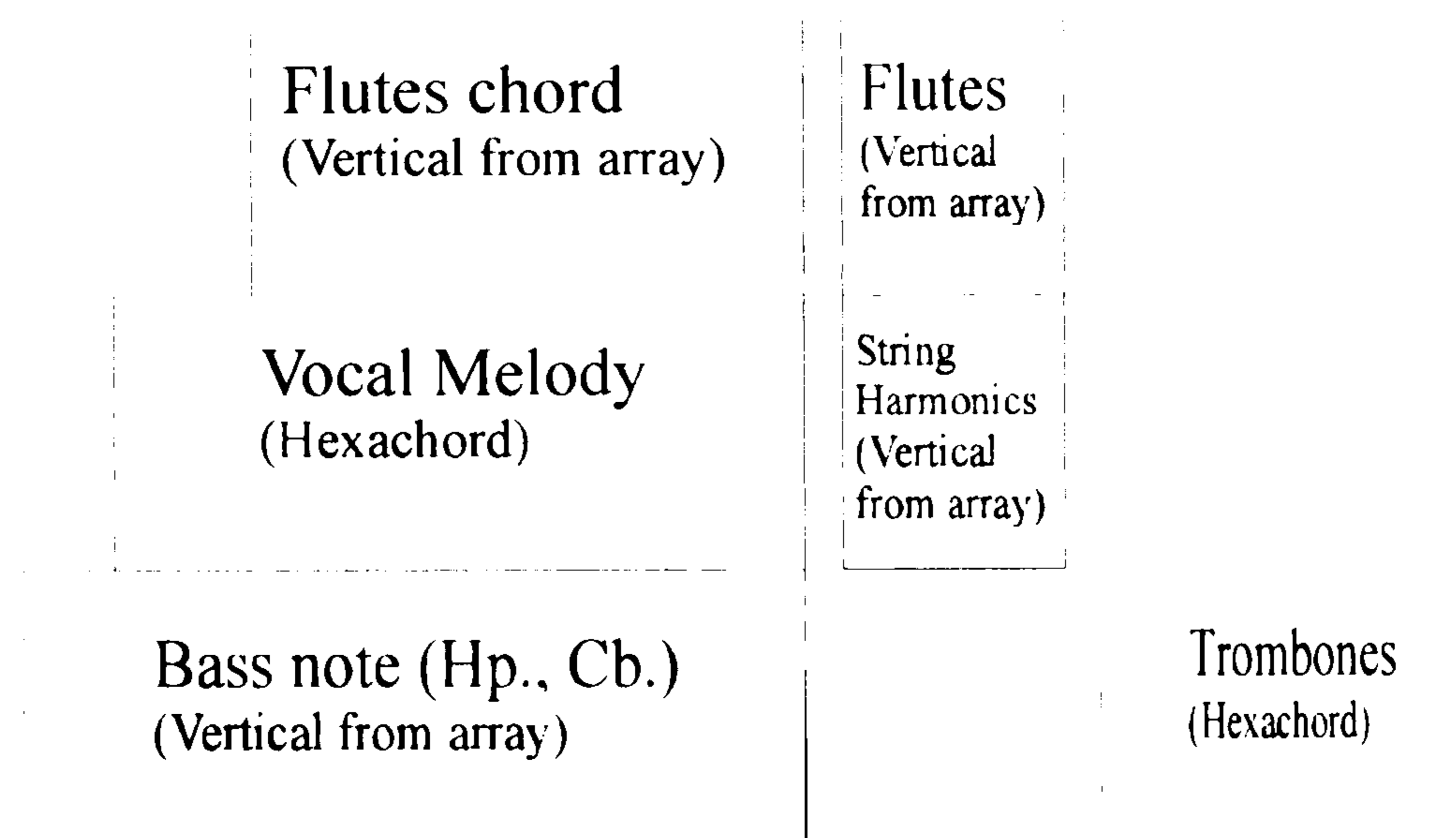
The image displays a musical score for Ex. 5.16, consisting of two main parts. The upper part features five solo staves: Solo Violin I, Solo Violin II, Solo Viola, Solo Violoncello, and Solo Contrabass. The lower part features three ensemble staves: Violin I, Violin II, and Viola. The solo parts include various musical notations such as slurs, accents, and dynamic markings (e.g., 's'). The ensemble parts show rhythmic patterns with slurs. Below the ensemble staves, two boxes labeled '40' and '45' indicate specific points of interest. At the bottom, three analytical diagrams are shown, each with a 'Pitch content' staff and a 'Collectional Affinity' staff. The first diagram is labeled 'Octatonic Collection III', the second 'D Harmonic Minor', and the third 'Octatonic Collection II'. Dotted lines connect these diagrams to the corresponding points in the musical score above.

Just as in the first refrain, a referential shift to D is made here, although in a different and more comprehensive way than previously. At the appropriate point (bar 42), as the first violin sounds its 'dominant seventh', all of the pitches belong to a D harmonic minor scale. Those pitches also combine to form all but one of the members of an octatonic collection, as marked. Thus, as the various parts 'swap' places at bar 43, each changing to a different hexachord, there is a referential octatonic switch overall. This reveals the sophistication of the manner in which Stravinsky hints simultaneously at a number of different systems of pitch organisation whilst actually using none of them to govern events. Indeed, in this instance, materials are not even faithful to the array on account of the 'garbled row forms'.

In examining the score, such relationships are clearly discernible, although it is of vital importance to consider that in the listening experience, they are not. The ritualistic nature of the materials subverts the functionality of the tonal, serial and octatonic environments at which they hint. There is no suggestion of harmonic resolution in any of the parts. Internal repetition is contrary to serial consistency, and the static character of each 'line' denies any sense of an octatonic contour. Further, the entire passage lasts under ten seconds, meaning that collection change cannot possibly be appreciated in any real sense, as the newly aligned intervallic environments are not inhabited for long enough to be perceived. Rather, in the context of such rapid and continual change, listeners are presented with the fact of opposition and denied the opportunity to understand why and how it is brought about. By implication, this makes the refusal of materials to tessellate all the more obstinate: although a number of networks are suggested, the most important characteristic of this music is that it is made up of parts which 'do not fit'.

Lacrimosa

In line with the overriding sense of opposition which characterises the *Requiem Canticles*, it seems appropriate to approach the work from the contrary viewpoint. The *Lacrimosa* is perhaps the best example of a movement in which pre-ordained systems and procedures are in use; there are clear bases on which materials demonstrably *do* fit. To begin with, it follows a clearly delineated pattern, as shown below (see Ex. 5.17)

Ex. 5.17:

This ritual is followed four times, with only slight deviations. On the second and fourth repetitions there is activity rather than merely a sustained note in the bass, and on the fifth cycle, the flutes/string harmonics block is absent. Following this, there is a concluding section which maintains certain of the basic elements – a melodic line for the soloist, vertical sonorities scored for flutes and string harmonics, and a closing block of muted trombones – but does not follow the order shown above. The manner in which these blocks are filled is similarly ritualistic. Stravinsky sets this text

(regarding a 'day of weeping') as a wailing contralto lament, and the melody winds its way through the IR portion of the series 1 array in the following pattern.

Ex. 5.18:

Just as this line horizontally traverses each of the hexachords, so the accompanying harmonic elements are generated vertically. The content of the chordal sonorities in the first two blocks of the ritual derive from upright stacks of pitches within the array: initially the second note of each of the IR^b hexachords are sounded together, and then the third, moving through to the sixth vertical followed by the first, after which the corresponding sonorities from the IR^a portion of the array are worked through in the order 2-6. The pitch materials for the trombones are all six rotations of the I^a hexachord, used in the order I^a1 , I^a0 , I^a3 , I^a2 , I^a5 , I^a4 . Tempting though it is to provide a comprehensive serial guide to the movement, such an enterprise would result in a demonstration of compositional process, rather than directly giving rise to

considerations of the listening experience. Besides, such a map is available elsewhere (see Ayrey, 2003: 218).

Testimony to the communicative power of the *Lacrimosa*, it has generated a huge amount of scholarship, to which Ayrey's is a particularly significant recent contribution. His analysis is impressively comprehensive and sophisticated, identifying a number of simultaneous processes. Seemingly, every event is accounted for in terms of how it contributes to the overall effect. In explaining the serial derivation, set-theoretic implications, and indeed certain of the tonal implications of materials he illuminates a great deal about patterns inherent to the movement. Certainly, there is potential for a great many connections in the musical surface. The ease with which it can be separated into the blocks shown in Ex. 5.18 demonstrates how each part of the ritual occupies its own dedicated space in terms of register and timbre. Thus, relationships abound between the various elements which make up so readily separated-out a texture. As different harmonic and melodic shapes are placed in each block both internally within a given repetition of the ritual and from one cycle to the next, there is massive scope for sophisticated interaction between discrete units.

From another point of view this music is extremely simple, even elementary in its conception. In essence the texture comprises a bass note, a static chordal accompaniment, and a melody. Undoubtedly, it is this simple clarity which enables Stravinsky's music to communicate so immediately and effectively to listeners. In accordance, rather than trying to explain every perceivable connection – all of the potential continuities – in so inherently discontinuous a musical fabric, the present intention is to try and consider which amongst those relationships might impact directly and significantly on the listening experience, and how they might form a network in order to do so.

Taruskin points out the octatonic properties of the opening phrase, as shown below (Taruskin, 1996: 1662).

Ex. 5.19:

The image shows a musical score for Ex. 5.19. It consists of three staves: a vocal line at the top, a piano right-hand part in the middle, and a piano left-hand part at the bottom. The vocal line is in 9/8 time and contains the lyrics "La - cri - mo - sa". The piano accompaniment is in 3/8 time. The score is divided into two sections: "Coll. II" and "Coll. III". The piano part includes markings for "non-ref. [#]" and "8va".

Taken as a Stravinskian fingerprint, this is a highly significant observation. Indeed, as Taruskin remarks, the Collection III group of pitches is to all intents and purposes a recurrence of the *Petrushka* chord. However, such an analysis – intended only to illustrate how octatonicism makes its presence felt – seems not to take into account an important characteristic of the musical texture. In the *Prelude*, the effect of so many rapidly changing relationships prevents the perception of specific ones; the music is ‘sensible’ as a whole in terms of such environmental harmonic shifts as are shown above. However, in this movement – at least during adherence to the ritual pattern – activity is far sparser. Crucial to its essence, chords are sustained, in general sounding isolated from their surroundings. This sense of separation between materials is fundamental to the ritualistic nature of the *Lacrimosa*. Thus, it is fitting to commence analysis by considering the immediate and local impression created by the various sonorities.

Ex. 5.20 shows the chords taken from the first block of the ritual in each of its four cycles.

Ex. 5.20:

The musical score for Ex. 5.20 consists of two staves: Flutes (top) and Contrabass and Arpa (bottom). The score is divided into four measures, labeled b. 229, b. 235, b. 238, and b. 245. The Flutes part is in treble clef, and the Contrabass and Arpa part is in bass clef. The Flutes part shows chords with notes G, A, B, C, D, E, F, G. The Contrabass and Arpa part shows single notes G, A, B, C, D, E, F, G.

There is a strong octatonic presence in each, although undeniably the most striking feature of these sonorities for listeners – particularly those either side of the neo-classical/serial divide – is that they are ‘not quite tonal’. The registral separation and temporal placing of the bass notes (heard in advance of the flutes) lend them perceptual priority akin to harmonic centrality, although there are many other nominally tonal features. Triadic combinations and perfect-fifth relationships abound, resulting in a situation in which, though it may seem a naïve point to make, the defining characteristic of the first two sonorities, for example, is that they are ‘almost’ a B⁷ and D Major chord respectively. Obviously, it would be ridiculous to attempt to explain how these chords and the piece as a whole function tonally. However, it is equally as outlandish not to recognise that alongside timbral oppositions and ritual repetitions, one of the most important means by which this music has its immediately arresting effect is precisely this non-functional, inconsistent – even approximate – reference to tonality.

G, just the ‘tonic’?

... when Stravinsky fixes the harmonic centrality of G natural by stating it in four octaves at the durational centre of the movement (bar 234), he performs a modernist act opposed to the normative beginning-end locations of pre-modernist tonics that has far-reaching consequences for the status of the cadential Gs. As the only structural downbeat in the movement, the centrum both focuses and destabilises the material that precedes and follows it, weakening the cadential function of the other Gs (which sound perfunctorily formal) while at the same time activating their pitch priority – a process that epitomises the centrum’s function as a “pole of attraction”.

(Ayrey, 2003: 224)

Ayrey's chapter proceeds with a voice-leading graph and a detailed set-theoretic explication of how all of this is brought about, identifying various intervallic complexes. Presently, a more simple view is proposed; however, the intention is not to disagree with Ayrey's reading but to try and reflect in discussion the clarity and directness of the musical surface. Rather than considering in detail *how* G is made prominent, the most significant factor here is *that* it is, and what that implies. As 'the final pitch class of four of the six cadential segments (...trombones) ending each phrase, including the last', it is its 'regular cadential location' at the end of the ritual pattern that elevates this pitch to prominence (*ibid.*). Those segments are shown below.

Ex. 5.21:

The figure displays six musical segments, each with its own staff and instrument labels. The segments are as follows:

- Segment 1 (b. 234):** Tenor Trombone and Bass Trombone parts. The Bass Trombone part ends with a cadence to G as IV in D (Bass Trombone F#-G).
- Segment 2 (b. 237):** Tenor Trombone and Bass Trombone parts. The Bass Trombone part ends with G as V in C.
- Segment 3 (b. 244):** Tenor Trombone and Bass Trombone parts. The Tenor Trombone part ends with a 'Cadence' to E (Ten tbn. D#-E).
- Segment 4 (b. 249):** Tenor Trombone and Bass Trombone parts. The Bass Trombone part ends with D# (= Eb)⁷.
- Segment 5 (b. 254):** Tenor Trombone and Bass Trombone parts. The Bass Trombone part ends with a 'Cadence' on C.
- Segment 6 (b. 264):** Tenor Trombone and Bass Trombone parts. The Bass Trombone part ends with a 'Cadence' (Bass Tbn.: IV-V in C). This segment is followed by a section titled **LIBERA ME** for Soloists & Horns.

Obviously, they are not cadentially functional in the sense of asserting the authority of G over other events in the movement, although there is evidence to support the idea that the underlying thought process is essentially tonal. In this context of timbral and registral isolation, there is a clear implication that these blocks are intended to act as links with immediately successive events, as shown. Particularly

significantly, preceded by the ‘cadence in C’ in the fifth block shown above. the final event in the *Lacrimosa* – in the sixth – is the melodic motion from E₂ (F) to G. since the *Libera Me* starts with a bare fifth based on C. Arguably, given the overarching ‘tonal scheme’ (see Ex. 5.8), G is presented as the dominant in an implicit IV-V-I melodic progression. Thus, typical of Stravinsky, in each of these examples the temporal function of a ‘cadence’ is itself subverted: that device is used referentially to suggest continuation, rather than articulation of the musical flow.

The role played by G, therefore, is actually more akin to a dominant than that of a tonic since it leads to future events, although at this point in discussion – comparison of two non-applicable labels – such vocabulary becomes misleading, since those terms imply tonal functions that are not relevant. It is unnecessary to understand precisely the manner in which G functions in order to appreciate its import as a referentially strong pitch. The important factor is that at these cadence points – where temporal connectivity is implied in the musical surface – that pitch is present, although the role it plays in bringing about such local harmonic continuity changes from one instance to the next. As explained below, this typically Stravinskian process of presenting the same object from different angles is also in evidence as applied to another pitch, A.

A-tonality at the close?

In the final passage of the movement (see Ex. 5.22 below), reference is clearly made to A as a tonal centre. At the start of the passage, the vertical chord is centred on that pitch: referentially speaking, it is an A major triad in first inversion, with both the minor and major sevenths added; the status of A as root is also felt as that pitch is scored as a ‘cello harmonic, making it timbrally distinct from the other pitches. This

coincides with that pitch in the voice, which subsequently fills in the ambiguous 'dominant-tonic' space of the A minor scale, ending on the leading note, G[#]. That sense of harmonic tension is resolved in the following bar, which concludes as the 'celli play A, ending a registrally displaced C-B-A – 'iii-II-I' – melodic 'progression'. In between this and the next vertical sonority, once more with A at the root (again doubled at the octave by distinctive string harmonics), there are fainter signs of its centrality: allowing for octave reductions, the harp, viola and 'cello ascend in clusters from the 'dominant' E to one including this referential tonic. Rather than describe every 'hint of A' in detail, the point is that at the end of the movement, after the ritual pattern has been departed from, the harmonic environment is strongly A minor-inflected, and there are isolated successions of surface events which indicate centrality on that pitch. This is shown clearly in Ex. 5.22.

Ex. 5.22:

The image displays a musical score for Ex. 5.22, featuring vocal and instrumental parts. The vocal line (Ca. Solo) is at the top, with lyrics: "Pi - e - je - su De - mi - se, do - na - tu - ra - de - us e - st, do - na - tu - ra e - st re - qui - em." The instrumental parts include Fl. pic., Fl. gr. I & II, Fl. abo., Arpa, Vln., Vla., Vc. Solo, and Vc. Fls. The score is annotated with various musical notations and performance instructions. At the bottom, there are two summary lines for pitch analysis:

Ca Solo I V
Vc, Fls

Vc. iii II I V I
Vla, Vc, Arpa

Given the prominence of this pitch at the end, it is worthwhile to trace its occurrence earlier in the movement. The summary example below shows how it might be seen to have harmonic implications as it appears in the first block of the ritual.

Ex. 5.23:

The diagram illustrates the relationship between vertical chords and horizontal melody for three instruments: Flutes, Contralto, and Bass notes. It is organized into two main columns: 'Vertical' chords (Reduced) and 'Horizontal' Melody.

Vertical Chords (Reduced):

- IRb Vertical 2:** Major 3rd + tone
- IRb Vertical 4:** 'I in D major'
- IRb Vertical 6:** 'I in F major'
- IRa Vertical 2:** 'V7 in A minor'
- IRa Vertical 4:** D# as 'tonic'
- IRa Vertical 5:** 'I' in A'

Horizontal Melody:

- IRb 5:** Tonic + major 3rd
- IRb 4:** 'V7 in D major'
- IRb 3/IRb 2:** 'I' in F major'
- IRb 1/IRb 0:** A minor collection harmonised by a modal 'dominant'
- IRa 0:** A minor collection
- IRa 1/IRa 2:** Movement towards A as 'tonic' cut short
- IRa 3/IRa 4:** (Foreign to the 'vertical')
- IRa 5:** (Foreign to the 'vertical')

Annotations and Connections:

- Flutes, Contralto, Bass notes:** These three instruments are grouped together at the top, with arrows pointing to the vertical and horizontal sections.
- A is central to both:** A note in the horizontal melody is connected to the 'Major 3rd + tone' chord.
- Reference to A as V in D:** A note in the horizontal melody is connected to the 'V7 in D major' chord.
- A as III in F major:** A note in the horizontal melody is connected to the 'I in F major' chord.
- Semitone/tritone:** A small diagram shows a semitone (A to Bb) and a tritone (A to Eb) relationship.
- * Foreign to the 'vertical':** This label is placed near the IRa 3/4 and IRa 5 chords.

In the first three cycles of the ritual, A forms part of a tone/major-third cell. In the second and third cycles that shape occurs as consecutive pitches in the array and is used in the vocal melody in order to make reference to dominant-seventh sonorities in combination with the chords in the orchestra. In the first cycle this is not the case, although that cell is inherent to the vertical chord. Again, the purpose here is not to argue that these sonorities can be perceived to function tonally. Rather, it is to suggest how they might be seen to contribute to the overall 'tonal' character of the movement. In the same way that G is continually projected in different ways, it is surely significant that these particular melodic shapes are heard in these particular harmonic contexts.

Similarly, there is a non-functional reference to higher-level tonal organisation: the fourth and fifth chords are rooted on E and D[♯] in the approach to the final passage, in which centricity on A is projected more overtly. This brings about a larger-scale occurrence of the perfect-fifth/semitone cell which creates tonal reference in the series itself, since that shape is projected at the start of each of these cycles of the ritual, leading to a more sustained reference to A. In both the 'E' and the 'D[♯]' chord, the harmonically defining elements – the bottom notes – are added from elsewhere, forming parts of hexachords R^a1 and R^a2 (see Ayrey, 2003: 215-16). Further, these two centres are sustained from the preceding trombone blocks (see Ex. 5.21). Clearly, therefore, given the compositional decisions that were taken in order to bring it about, this larger-scale tonal implication is intended, whether it functions or not. Over the course of the *Lacrimosa*, while centricity on G is projected by dint of recurrence, the prevalence of A seems also to be implied, gradually coming into focus towards the end. Interestingly, the opposition between those two centres seems to be borne out in activities in the second block of the ritual, as explained below.

Harmonic continuity

Considering the manifold embodiments of opposition in this movement – between timbres, between the fixed and the mobile, between the vertical and the horizontal – it is unsurprising that this type of relationship seems to be the basis for harmonic continuity. As described above, the contralto solo seems to elevate A to importance, juxtaposed with the trombone figures, which in some sense project G as a dominant of C. The relationship between those three pitches runs throughout the *Lacrimosa*, and this is also apparent in the second block of the ritual, as shown below.

Ex. 5.24:

The example shows five measures of music for Flutes and Strings. The Flutes part is in treble clef, and the Strings part is in bass clef. Vertical dashed lines connect the two parts in each measure. Below each measure, the harmonic center is identified: C, A, G, C, and A respectively. A note in the fourth measure indicates a deviation from the ritual pattern in bars 253-4, where no chord is present in this cycle.

Measure	Flutes	Strings	Harmonic Centre
b. 232	[Musical notation]	[Musical notation]	C as harmonic centre
b. 236	[Musical notation]	[Musical notation]	A as harmonic centre
b. 243	[Musical notation]	[Musical notation]	G as harmonic centre
b. 248	[Musical notation]	[Musical notation]	C as harmonic centre
b. 260	[Musical notation]	[Musical notation]	A as harmonic centre

(Deviation from ritual pattern in bars 253-4; no chord in this cycle)

In all five sonorities there is an opposition between the flutes and the strings. Taken in isolation, the strings project C, G and A, although this is obscured in performance by the flute parts. As the same points in time recur by repetition of the ritual pattern, so does the prominence of those pitches. However, it is hard to characterise the relationship between them. Were this a functionally tonal piece, words such as 'tension' and 'friction' might serve the purpose, although they are not appropriate here since on account of the continually shifting relationships. Without any consistency underpinning the means by which harmonic centres are established it

is difficult to appreciate any relative changing of position between them; rather than any one of them being stronger than the others, they statically coexist. Eventually G wins out, simply because it is the harmonic centre at the end, yet it is notable that these are the three pitches which conclude the melodic line in the final amen (see Ex. 5.22).

The idea of formal clarification towards the close is typically Stravinskian, occurring, for example, in the *Symphonies of Wind Instruments*, with its ending chorale, and in the ritual passage cited above in the *Symphony of Psalms* (Ex. 5.3). Just as that notion seems applicable to the *Lacrimosa*, so it might be said to function in *Requiem Canticles* as a whole.

Postlude

As Straus says, ‘the Postlude of the *Requiem Canticles* is among Stravinsky’s most moving and effective works. Its power derives in part from its biographical circumstances – it concludes his last major piece, a requiem that he evidently intended as his own’ (Straus, 2001: 243). As explained above, there are numerous references to earlier works by the composer in this piece, and this final movement might be seen as a synthesis of the various ways in which he communicates with listeners. Craft describes the structure as ‘the chord of death, followed by silence, the tolling of bells, and again silence, and again silence, all thrice repeated, then the final three chords of Death alone’ (quoted in Straus, 2001: 243). Accordingly, the principal characteristics are disconnection and repetition, and the ritualistic nature of this movement brings the larger-scale formal ritual to a close.

Like the coda of *Psalms*, it occurs in the context of heightened tension: the preceding *Libera Me* ends on a unison B[#] pedal, acting as a referential dominant to the F-centricity of the *Postlude*. Further, throughout that penultimate movement there is an opposition between the singing by the soloists and *parlando* recitation by the choir. This creates a situation in which the text is used to obscure itself. The lack of rhythmic coordination between spoken parts prevents it from being heard clearly, and the tempo ($\text{♩} = 170$) further enhances the frenzied nature of this chant. Thus, as the choir proclaims 'Li-be-ra Me' as one, immediately before the first chord of Death, there is a sudden, contrasted sense of unity: the listeners' attention is instantly focussed. This heightens the impact of the *Postlude*: time seems suspended not only on account of the sudden drop in tempo but also in the clarity which defines the musical texture and, perhaps most importantly, the sudden change of timbre (see Ex. 5.25).

Ex. 5.25:

POSTLUDE
♩ = 40

Flauto picc. (8va alta)
Flauti grandi I, II
Flauto alto
Piano
Arpa

CELESTA
Campana
Vibral
Coran I

290

libato, non legato (sempre)
libato, non legato (sempre)
libato

CHORO
parlando
- CARO SACERDOTE PER HONOREM DOMINI VERBARIS DICARE SACERDOTE LUMEN PER LIBERA ME. LI-BE-RA ME.

CHORO
4 soli
ra - tal - de.

I, III
Corno
II, IV

Besides their topical connotations, the use of bells – an altogether new sound at the very end of the work – subverts the sense of reaching a conclusion but suggests transcendence of the preceding temporal flow. This implication is particularly strong given the choral appeal for freedom or, more precisely, release. Surface timbral opposition exemplifies the directness and immediacy with which Stravinsky's music communicates, focussing the attention on the local timescale, marked by contrast. However, there are also clear bases by which this movement attains to larger-scale, global completion for *Requiem Canticles* as a whole.

As Ex. 5.25 shows, the horn sustains an F pedal underneath the chords in the bells in the first refrain. In the second and third refrains it holds a G[♯] and a B[♯] respectively, before holding a pedal F in the final bar. Thus outlining an F minor triad, it confirms that pitch as referential tonal centre both for the *Postlude* and the work as a whole. More detailed accounts of the pitch organisation in this movement are available elsewhere: Straus and Taruskin discuss the diatonic and octatonic properties of various of these sonorities (Straus, 2001: 243-8; Taruskin, 1996: 1665-73). In terms of serial derivation, Straus explains that the first set of bell chords are effectively the Prime and Inverse versions of the two series sounded simultaneously (Straus, 2001: 242). Crucially, however, there is no way in which listeners might experience overall intervallic completion, since the series are superimposed and the pitches which in the series form a melodic contour are registrally displaced. Even at the end of the work, Stravinsky conceals the underlying framework which governs events, in order to suggest a number of possible ones. His communicative process is based on opposition, although in a peculiarly constructive manner; rather than defining things by what they are not, he provides a number of possible definitions of what they could be.

Section 3

Situations in Musical Geography

Chapter 6

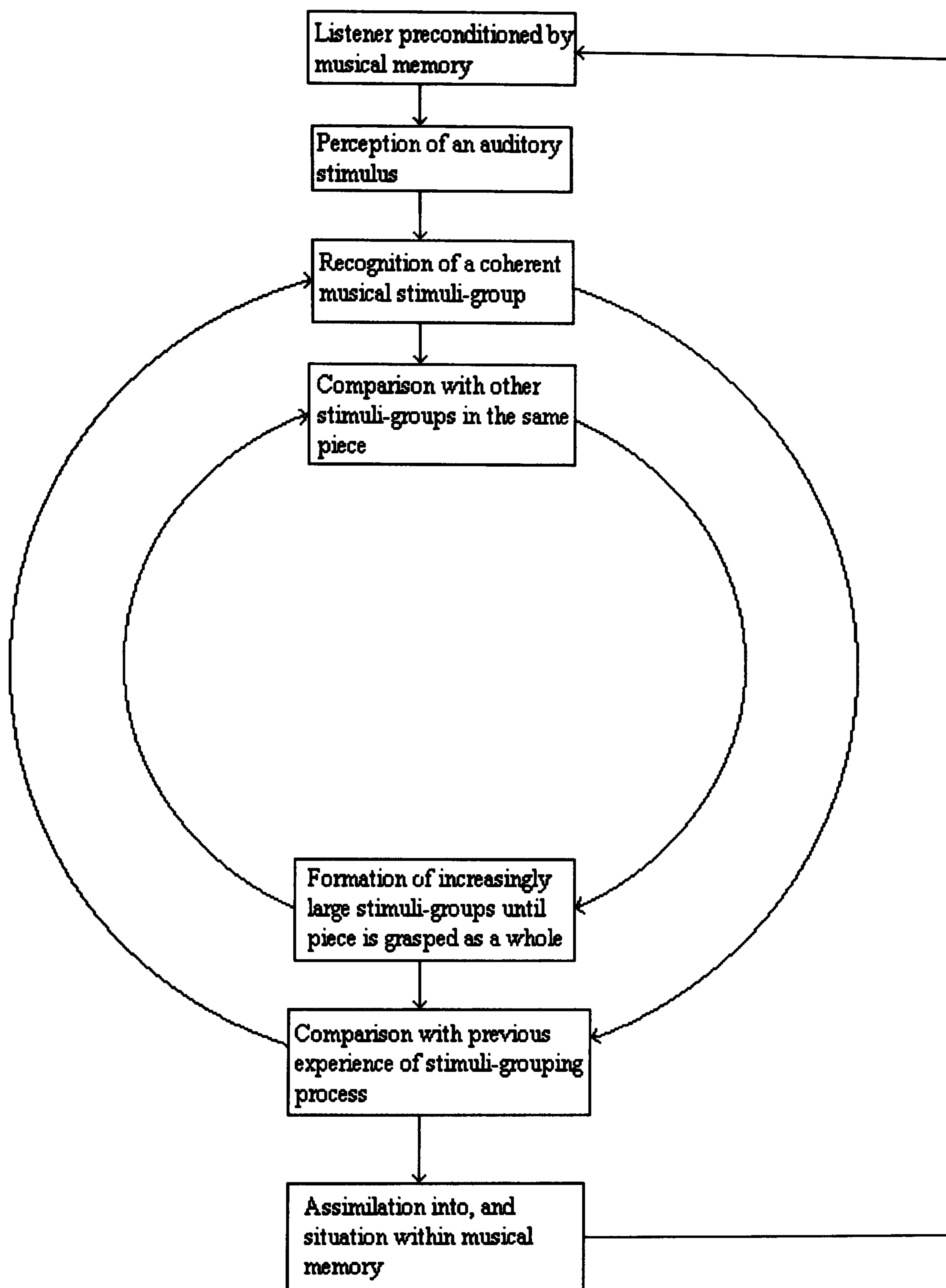
Reference Points and Situations in Musical Geography

The previous three chapters discussed the process of construction within their respective case studies. *Atmosphères*, *Requiem Canticles* and *Jeux* were each considered in terms of how the sounds notated by their composers present significant musical relationships, affording listeners the opportunity to create an overall mental representation, a meaningful network of connections between musical events. In the Ligeti, successive arc-shaped changes in intensity, manifest in various ways, combine to create a single ‘grand arch’ overall; although Stravinsky’s blocks are unconnected on the surface, that moment-to-moment discontinuity is opposed by larger-scale ‘tonal’ connectivity; Debussy’s waves undergo a process of organic growth, occurring over and across the ambiguous structural junctures which underlie them. Overall, the analyses in Section 2 have discussed how the interactions between events *internal* to each work – should listeners perceive them – offer (and indeed challenge) a means of constructing memories of those pieces. The case studies explain how music might be constructed in the minds of listeners ‘from the inside out’.

Crucial to listening as construction is the notion of perspective, which is perhaps best understood by analogy with vision. One might think of a piece of music as akin to a landscape painting. Thus, the most foreground events (‘details’ occurring over short time spans – for example motifs and smaller perceptual units) only have direct implications for others in the immediate surroundings: they offer meaningful information by inviting close-up observation, such that viewers cannot see the whole picture. However, they might have greater significance, depending upon how they contribute to larger-scale, and thus further-back-ground processes, which take longer periods of time to unfold (please turn over).

These presentational fun and games are intended not to frustrate the reader but to illustrate a fundamental feature of the construction process. As sound events are grouped into increasingly large units, they are heard from correspondingly distant perspectives, as larger bodies of musical information are synthesised. Read at arms' length, this sentence takes its place within the first paragraph of this page, and – the full extent of the analogy can hardly be held back any further – this thesis is probably one of a number of documents on the desk, in the office, in the department. Thus, hopefully, as well as contributing to the construction of a whole, the ideas within it are meaningful in terms of their situation relative to other ideas.

The analyses of *Atmosphères*, *Requiem Canticles* and *Jeux* presume a privileged hearing, as they explain the significance of the parts of those pieces almost exclusively in relation to their wholeness. They are discussed with reference only to themselves, in keeping with their modernist aesthetic. Importantly, however, they are not listened to in a vacuum. Simultaneous with their construction from the inside, the network of events in a piece of music might also be meaningful by comparison with events lying *outside* of that whole; it is also situated in relation to other pieces. This implies a 'zoomed-out' perspective, from which listeners compare musical events from the outside in, as is reflected in the diagram in Ex. 1.7 (reproduced as Ex. 6.1). The process of construction lies in the inner circle, that of situation in the outer, and it is the latter which concerns this third section of the thesis.

Ex. 6.1:

Suitably, starting from the outside of the diagram, it is of crucial importance to note that listeners bring 'baggage' to any musical experience; their reception of a given piece is dependent upon their memory. As people develop tastes, they develop listening habits through repeated exposure to music requiring a certain kind of construction. Effectively, therefore, the very construction process itself is assimilated

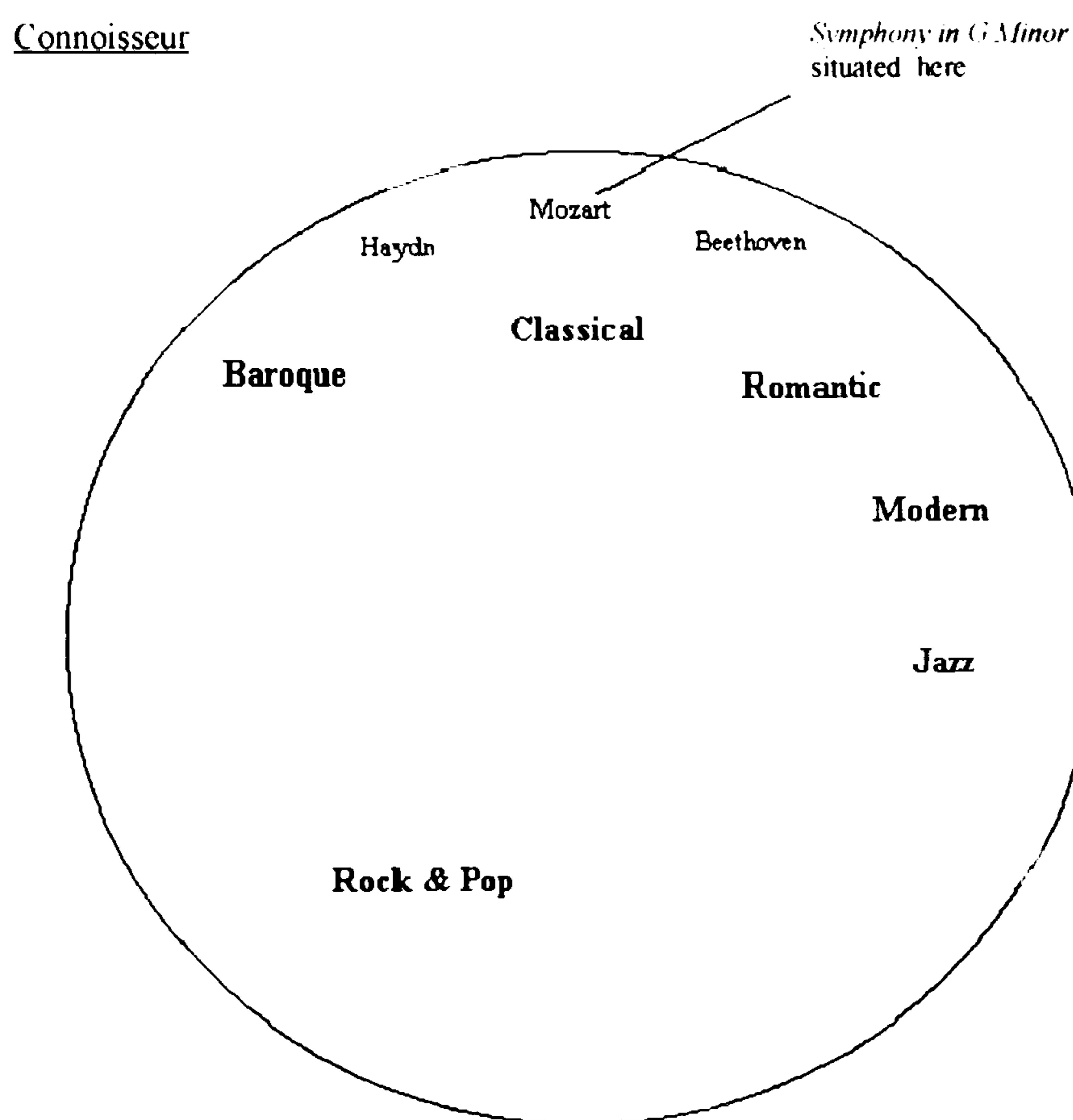
into musical memory and conditions future musical engagement. This issue, enculturation, is highly pertinent in the twenty-first century. The increased ease of access to music from all over the world has particular implications for listening as situation, as people's tastes are increasingly diverse. Therefore, it is impossible to write about how music might be situated with any authority, since the process is different for every listener. Nonetheless, by positioning their music in relation to other pieces or styles, composers can exert their influence upon it.

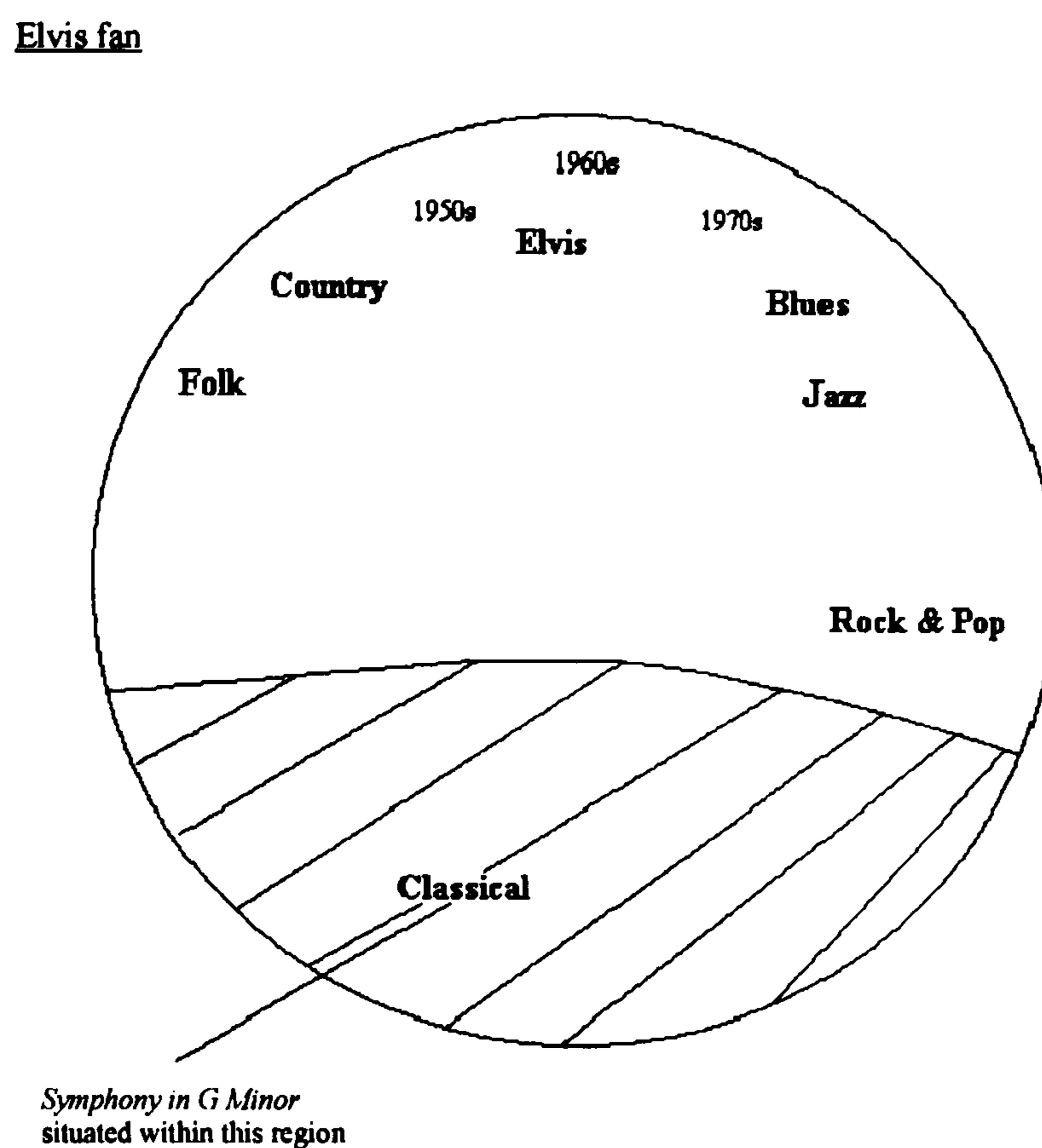
The notion of listening as situation implies that the experience of recognising a given musical object, be it an entire work or merely a single note, is determined relative to that of others, foreign to the present work. Of course, this does not imply that every musical sound heard is unconsciously juxtaposed with the entire contents of the listener's memory. Rather, musical objects are considered as belonging to particular styles. Within a given style, musical events carry implications for continuity; they furnish the listener with expectations as to the likelihood (and conversely, the unlikelihood) of future events and with a basis for understanding the significance of past ones. Thus, depending on the relative probability of their occurrence, musical objects can typify styles to differing extents (Meyer, 1956: 45-60). Examples might range from a 'bluesy' guitar lick to an entire sonata-form movement. If listeners are not appropriately qualified, however, they cannot recognise these implications and will not be able to situate the music 'properly'; they cannot identify the implications of the sounds within the appropriate style. Every individual has a personal 'musical geography' based on the music with which they are enculturated, within which regions might be more- or less-precisely defined by styles. This is a useful metaphor, as it provides a basis for mapping the virtual space in which music exists.

Situations in Musical Geography

Connoisseurs of classical music might appreciate the extended recapitulatory transition in Mozart's *Symphony in G Minor*; whilst given the same set of musical events, staunch Elvis fans might simply hear a piece of orchestral, or even just 'classical', music. Thus, there is a huge disparity in their respective experience of the relevant musical style. Where the latter have only a very elementary knowledge of this sort of grouping process, the former are well accustomed to hearing the sorts of patterns inherent to this piece, to the extent that they recognise the significance of its deviances from the norm. Thus, the Elvis fans cannot make as exact a comparison between K. 550 and other music like it as the connoisseurs; they situate it differently within their musical 'geographies', as shown below (see Exx. 6.2a&b).

Ex. 6.2a:



Ex. 6.2b:

As shown, the connoisseurs' acute understanding of the *Symphony* enables them to situate it quite exactly. They are aware of its distinction from, and relationship with, other similar music, such as works by Haydn and Beethoven. In contrast, the Elvis fans can only do so generically, in a region with which they are not familiar. This might seem like a rather complicated way of saying that people recognise musical styles. Indeed it is, but this concept has a number of ramifications for, for example, the notion of stylistic distance (how people conceive the extent of similarity between styles); or for how the socio-cultural attachments of styles interact with musical geography to enable communication. These will be discussed in due course; but first there is more to be said on the process of situation. The *Symphony in G Minor* example above can be explained in quite simple terms, based on the idea that the *Symphony* itself belongs wholly to the classical style. However, since modern listeners are acquainted with a wide range of music, composers can communicate using a

number of different styles within a single work. The notion that music belongs to a style is manipulated perhaps most simply and clearly in popular music.

Sounds familiar: pop music and having heard it all before

Popular music is designed to be as memorable as possible – indeed, it is dependent for its popularity upon listeners’ memories. The predominant genre by far is song, and in terms of the communication process, lyrics play the most important role: words are a far more efficient, direct and – particularly for musically unschooled listeners – memorable agent for meaning. By and large, pop songs serve as a vehicle for the delivery of lyrics. Perhaps as a consequence they are based around simple formal schemes, usually with unambiguous melodic, harmonic and rhythmic content. There is of course no set formula, although the pattern below can be taken as typical of the genre.

Ex. 6.3:

(Intro)/Verse/Chorus/Verse/Chorus/Middle 8/Chorus x 2/(Outro)

A B A B C B B

This basic outline is varied a great deal in practice: often bridge passages are used to smooth transitions from one section to the next; middle-8s are by no means found in all pop songs. However, it embodies two structural principles which pervade the vast majority of popular songs. Firstly, familiarity is inbuilt: the pattern is based on repetition and therefore on expectation. Secondly, the formal hierarchy brings about clarity in terms of the relative expressive intensity of the various sections: due to its recurrence, the chorus is elevated to a position of structural importance. Thus,

pop music is readily organised for listeners. What they hear is automatically familiar, and how they are to hear it is also made clear.

On the one hand, the model results in very limited scope for expression, as however much it is distorted, there are only so many ways of using its three elements. From another point of view however, this scheme offers an opportunity for heightened clarity of communication within that scope. Just sonata-form movements present a particular version of a basic large-scale continuity – exposition-development-recapitulation – so the structural junctures to which this formal pattern gives rise recur in virtually all popular music. This has the corollary that they are extremely familiar to a great many listeners, which in turn can be exploited. Since the construction process is to all intents and purposes taken for granted, there is a heightened emphasis on situation. By stylising their music, pop musicians can influence its position within musical geography, and accordingly attract listeners of particular tastes.

A particularly clear example of listening as situation, and how it can be manipulated, can be found in hip hop. As rappers perform to backing tracks constructed out of samples of pre-existent recordings, whole styles are imported and placed side by side. Essentially therefore, any material might be used in the accompaniment; within certain generic confines (a 4/4 drumbeat and a repeating, usually harmonically static bassline seem to be the norm for hip hop) there is great scope for eclecticism, in accordance with the artist's choice of samples. A notable group in this regard is 'A Tribe Called Quest', which consisted of two rappers, Q-Tip and Phife Dawg, and one DJ, Ali Shaheed Muhammad. They came to prominence in the early 1990s, at which time their backing tracks were notable for their (relatively) broad choice of source materials.

... [A Tribe Called] Quest built upon De La Soul's jazz-rap revolution, basing tracks around laid-back samples instead of the played-out James Brown fests that many rappers had made a cottage industry by the late '80s....¹

...Tribe looked more to jazz as well as '70s rock for their sample base – “Can I Kick It?” plundered Lou Reed's classic “Walk on the Wild Side” and made it viable in a hip-hop context.


(Bush, 2003: 475)

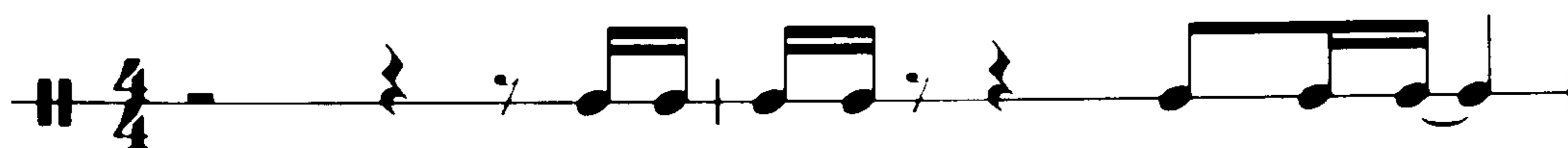
For any rap group, the primary channel for communication is the lyrics, although by implication, the importance of the accompaniment is heightened in A Tribe Called Quest's output, on account of their use of a broader range of samples than their contemporaries. Thus, their ability to influence listening as situation is central to their artistic identity. The discussion below explores this issue, taking their aforementioned international hit, ‘Can I Kick it?’ (1990)², as an example.

‘Can I Kick it?’ A Tribe Called Quest

As with the other works in the thesis, a suitable starting point is to consider this title. ‘Can I Kick it?’ is not a reference to any musical procedure, but is merely the lyric used as a hook line in the chorus of the song, as follows:

Ex. 6.4:

(Swing , loose rhythm)



Solo rapper: Can I Kick it? *Crowd:* Yes you can!

¹ De La Soul was another rap group, with whom members of A Tribe Called Quest collaborated.

² There are a number of remixes of this song. Presently, the ‘Boilerhouse mix’ is under consideration.

Certain musical aspects of this line make it memorable. As a call and response refrain it involves both the rapper and those to whom he is rapping: the record invites listeners to ‘join (in with) the Tribe’. However, considering the actual content of the phrase, alliteration brings about a (relatively) interesting phonetic pattern: the consonants C, K and Y all recur, while the vowel sounds bring about a kind of arch, following the rhythmic shape of the phrase. Saying the phrase with the consonants taken out reveals a long-short-long pattern, the palette contracting towards the middle of the phrase:

Ex. 6.5:

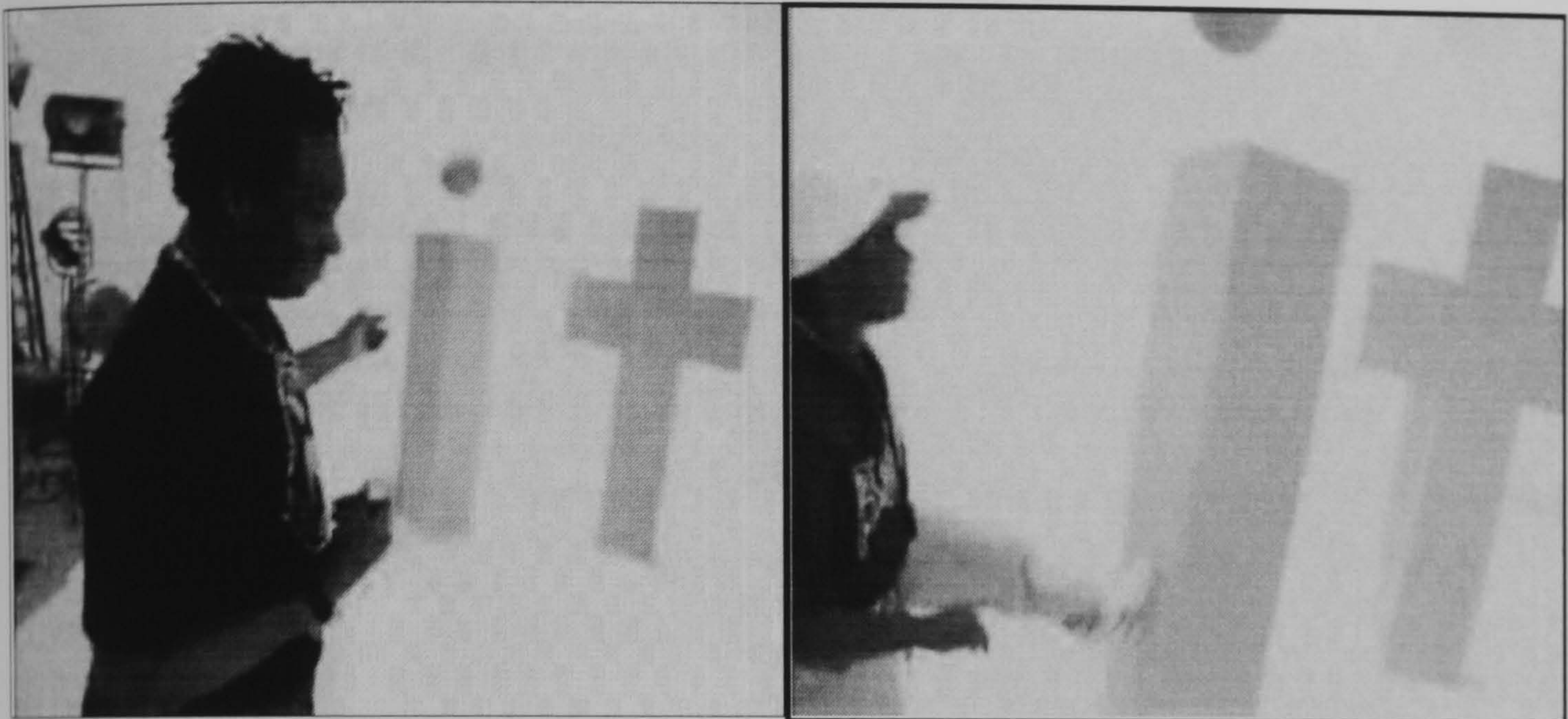
Can I kick it? Yes you can.

a – I – i – i e – ou – a

long → short → long
sounds sounds sounds

As always, the purpose here is to discuss aspects of musical, rather than textual communication, and this level of analysis yields interesting results. However, in as lyric-heavy a genre as rap, it is worth briefly considering what (and more importantly, how) the words mean.

Essentially, ‘Can I Kick it?’ is a vague question, open to many interpretations, and in the promotional video this carefreeness is given a comedic slant: literally, members of the group kick ‘it’!

Ex. 6.6:

As to the sense in which *it* is used in the song, the phrase is a colloquialism for simply relaxing, in a positive state of mind: ‘to “Kick It” means to hang out and have fun’ (Songfacts website: [n.d.], accessed 3 February 2008). Hence, at the end of each refrain, having gained approval from the responding party (who agree, or permit, that they can indeed ‘kick it’), Q-tip and Phife Dawg respectively perform a verse each. The lyrics are full of such colloquialisms (see below), and rather than consider each of the meanings conveyed in turn, it is more worthwhile to observe the overall thrust of the text.

Ex. 6.7:

[Q-tip]

Can I kick it? (yes, you can!) *7x*
Well, I'm gone (go on then!)

Can I kick it?

To all the people who can quest like a tribe does
Before this, did you really know what live was?
Comprehend to the track, for it's why cuz
Gettin' measures on the tip of the vibers
Rock and roll to the beat of the funk fuzz
Wipe your feet really good on the rhythm rug
If you feel the urge to freak, do the jitterbug
Come and spread your arms if you really need a hug
Afrocentric living is a big shrug
A life filled with <horn> that's what I love
A lower plateau is what we're above
If you diss us, we won't even think of
Will nipper the doggy give a big shove?
This rhythm really fits like a snug glove
Like a box of positives is a plus, love
As the tribe flies high like a dove

[Phife Dawg]

Can I kick it? (yes, you can!) *7x*
Well, I'm gone (go on then!)

Can I kick it?

To my tribe that flows in layers
Right now, phife is a poem sayer
At times, I'm a studio conveyor
Mr. Dinkins, would you please be my mayor?
You'll be doing us a really big favor
Boy this track really has a lot of flavor
When it comes to rhythms, quest is your savior
Follow us for the funky behavior
Make a note on the rhythm we gave ya
Feel free, drop your pants, check your ha-ir
Do you like the garments that we wear?
I instruct you to be the obeyer
A rhythm recipe that you'll savor
Doesn't matter if you're minor or major
Yes, the tribe of the game, rhythm player
As you inhale like a breath of fresh air

(Metrolyrics website: [n.d.], accessed 2 February 2008)

Fundamentally, this is about identity, and the quality of the Tribe's output: what they do 'to the beat of the funk fuzz'; how they 'say poems', 'convey studios', and love 'a life filled with <horn>' (at that point in the song, a sample of a single chord played by a Motown-esque brass section is inserted, as if an expletive has been edited out, as is typical of radio edits for many hip hop recordings). As well as defining (albeit loosely) the identity of the group, the lyrics of the verses. (in accord with the call and response refrains) invite listeners to identify with the Tribe: to 'follow [them] for the funky behaviour'. Obviously, that invitation will not be accepted by all: those whose taste does not include hip hop will probably not be interested. Thus, the lyrics address a certain kind of listener; the song is situated in order to appeal to a particular audience, using colloquialisms and references to a love of the genre. In fact, at times it is yet more specifically targeted. The mention of 'Mr. Dinkins' in the second verse is a reference to David Dinkins, the first black Mayor of

New York (from 1991-93), the Tribe's home city. To informed listeners, the geographical origins of the group are in fact a fundamental part of its musical identity, containing information as to how its style is – literally – situated. Indeed, the group's website has it that they were 'largely responsible for the popularity of Jazzy Hip-Hop that seemed to dominate the East Coast sound of the early 1990s' (A Tribe Called Quest website: [n.d.], accessed 2 February 2008).

The New-York roots of the band are more clearly communicated in the spoken accents of Q-tip and Phife Dawg than through musical styles, however. In fact, they are accentuated further still through the use of spoken-word samples. Twice in the opening refrain, rather than the usual group of New Yorkers' reply to 'Can I Kick it?' ('Yes you can!'), a much older aristocratic Englishman expresses inquisitive surprise ('Er,...you can?!'), later saying 'Then, do so at once!': in between the two verses, a Brigitte Bardot-like voice asks, sexily, 'Mmmm... how do you say?'...([Phife Dawg]: 'Can I Kick it?'). By implication, the rappers enter into a quirky dialogue, their voices juxtaposed with those of others belonging to markedly different demographics. Therefore at some level, it is the accents of the voices – with their attached associations – rather than the content of what is said, that bring about their effect.

The same principle – juxtaposition – is also central to the backing track, as parts of other records are literally placed next to one another. From one point of view, sampling might seem like a crude and unintelligent way of combining styles. None of the musical content is actually transformed because it is merely cut out of one context and placed in another. Frequency bands can be boosted or filtered out, and the overall pitch and tempo of a sample can be changed, although the actual musical substance – 'the notes themselves' – cannot be altered. Thus, there is a great deal of subtlety in choosing and manipulating samples appropriately. The Tribe's use of Lou Reed's

'Walk on the Wild Side' has arguably played a huge role in bringing about the international fame (or familiarity) of 'Can I Kick it?'. However, other samples are also used, and the ways in which they interact are rarely discussed in any detail. The table below is not comprehensive, although it contains the names of the principal recordings used to construct most of this song (Second Hand Songs Website: [n.d.], accessed 2 February 2008).

Ex. 6.8:

Year	Name of recording ³	Recording artist	Nature of sample
1968	'Fried Okra'	The Watts 103 rd Street Rhythm Band	Looped Drumbeat
1970	'Spinning Wheel'	Dr. Lonnie Smith	Looped Drumbeat
1970	'The Way You Do the Things You Do'	David Porter	Unclear
1971	'Hard Times'	Baby Huey and the Babysitters	Drum beat; Guitar & bass riff (2 beats long)
1975	'You Sexy Thing'	Hot Chocolate	Unclear
1976	'Sun Shower'	Dr. Buzzard's Original Savannah Band	Guitar major-triad glissando (1 beat long)
1972	'Walk on the Wild Side'	Lou Reed	Looped 2-bar riff (full band texture)
1977	'What a Waste'	Ian Dury and the Blockheads	Looped 2-bar riff (full-band texture)

Despite the Tribe's eclectic choice of samples relative to their contemporaries, these source materials are actually more remarkable for their points of similarity than their differences. They were all released within a decade of each other, and are all verse-chorus type forms using standard popular-music instrumentations (singer, bass guitar, drum kit (percussion in 'Sun Shower'), electric guitar and/or keyboards (piano or electric organ), sometimes a brass section). Most importantly, they are all in 4/4, enabling them to be combined and integrated easily within the eventual track.

A stylistic division can be imposed, however, marked by the shading, and

³ Citations for all of these recordings can be found in the Bibliography.

reflecting the 'size' of the extracts taken. The first five samples in the table fall within the bounds of 1970s jazz-funk and soul. They combine to form a generic hip hop framework; a drumbeat with a few decorations, which runs almost throughout 'Can I Kick It?'. Indeed, the verses are accompanied using only that bare structure, with the mere addition of a bassline, a repeating 1-bar figure centred on F². In other parts of the form however, the implied textural gap is filled by the two remaining samples.

'Walk on the Wild Side' and 'What a Waste'

Theoretically, this ought to imply stylistic inconsistency, although that effect is controlled in various ways. There is harmonic consistency in that both samples are static: the former alternates between bars containing C and F major chords, the latter between E minor and F. Further to this, the stylistic implications of the Lou Reed sample actually resonate quite closely with the five discussed above. Its double bass riff has connotations of jazz, and the guitar is strummed in a funk-like rhythmic pattern (indeed, although it is not sampled, in the original recording Reed's vocal lies somewhere between speech and song: to all intents and purposes he is rapping on 'Walk on the Wild Side').

The extract taken from 'What a Waste' follows a reggae pattern (with a kick-drum accent on beat 3 of the bar, rather than kick-snare-kick-snare 1-2-3-4): it is stylistically more distinct. This is played upon in the lyrics leading up to the sample: 'As the tribe flies high like a dove', and 'As you inhale like a breath of fresh air', suggest liberation and renewal respectively, notions reflected by the entry of new material. However, the ever-present hip-hop drumbeat is mixed far louder than Dury's reggae beat, ensuring stylistic consistency.

The extent to which the samples combine to form an integrated texture in 'Can I Kick it?' goes beyond a mere common drumbeat, however. Ex. 6.9 shows a transcription of a passage taken from the end of the first verse.

Ex. 6.9:

Q-Tip (1st time only) American male (2nd time only) English male (2nd time only) Children (2nd time only)

Voice: As the Tribe flies high like a dove Ha ha! — We'll start all over again Yeah —

Keyboards and Guitars: (E. Pno.) (E. Gtr.)

Bass

Drum Kit

What a waste *Hard Times*

The drumbeat consists of those from various of the sampled songs, processed and layered on top of each other such that they cannot be distinguished from one another. Two examples are given:

(Swung ♩s) *Hard Times*

(Swung ♩s) *Spinning Wheel*

Walk on the Wild Side

Voice: French female English male

Mmm, how do you say...? A Tribe Called Quest

Keyboards and Guitars: (A. Gtr.)

Bass: (Dbl. Bass) gliss. gliss.

Dr.

Walk on the Wild Side

The switch in the 'guitar part' from the 'What a Waste' sample to the riff taken from 'Hard Times' is unnoticeable, as the two form a single melodic line. Following on from the example, the glissando sample from 'Sun Shower' is timbrally similar to both: effectively, new instrumental parts are constructed out of pre-existent materials.

The larger-scale integration of the samples is straightforward. The formal pattern alternates between choruses, verses and breaks, defined by the samples used, as shown in Ex. 6.10. The result is a simple, recurring harmonic shape, although it is worth noting that most of the samples are changed in pitch from their original context: at some level, decisions have been taken regarding harmonic structure.

Ex. 6.10:

Intro (8 bars) Walk on the wild side Harmony: C-F	Chorus (8 bars) Walk on the wild side Harmony: C-F	Verse (16 bars) Drumbeat & bassline Harmony: F#	Break (8 bars) What a waste Harmony: E-F	(Intro) (8 bars) Walk on the wild side Harmony: C-F
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Chorus (8 bars) Walk on the wild side Harmony: C-F	Verse (16 bars) Drumbeat & bassline Harmony: F#	Break (8 bars) What a waste & Romeo and Juliet (Prokofiev) Harmony: E-F	(Intro) (8 bars) Walk on the wild side Harmony: C-F	Chorus (8 bars to fade) Walk on the wild side Harmony: C-F
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At the outset, the 'Walk on the Wild Side' sample is heard in its original key of C, and that centre is firmly established as home for this new context, as the music moves repeatedly between chords I and IV. A fixed hierarchy results, in which the different sections of the form have set roles to play: the verses are harmonically weak, due to their tritonal relationship with the choruses (in F# and C respectively); the breaks are

tense, with their semitonal chord change (Em to F). Thus, there is a feeling of relaxation as the progression moves to the stable tonic for the 'Can I Kick it?' refrain, enhancing its memorability. Although listeners' expectations are satisfied harmonically, they are played upon far more interestingly using styles.

Although the Lou Reed and Ian Dury samples are in many ways foreign to the jazz-funk and soul ones used to construct the drumbeat, they are presented as an integrated part of the texture, as demonstrated above (see Ex. 6.8). In the break following the second verse, however, there is a sample of Prokofiev, the first bar of the *Allegro pesante* at rehearsal figure 2 in the *Romeo and Juliet Suite No. 2*. Naturally, this stylistic twist is unexpected: first-time listeners typically react with surprise or humour⁴; again, juxtaposition results in quirkiness. Significantly, this coincides with the most harmonically tense section of the form: the one-bar segment is manipulated so as to conform to F minor, fitting within the pitch scheme. However, those harmonic implications are outweighed by the implied stylistic change. The relevant passage is shown overleaf in Ex.6.11. Certainly, this might have been notated otherwise, although the shape of the score alone in Ex. 6.11 shows the improbability of an orchestral entry in this hip hop context: although the inclusion of the Prokofiev enables the harmonic progression to continue, the stylistic discontinuity is of Stravinskian proportions. (Indeed, compare the visual shape of this example with the *Postlude of Requiem Canticles* (see Ex. 5.25).)

⁴ I have used this example to discuss stylistic reference in teaching and seminars.

Ex. 6.11:

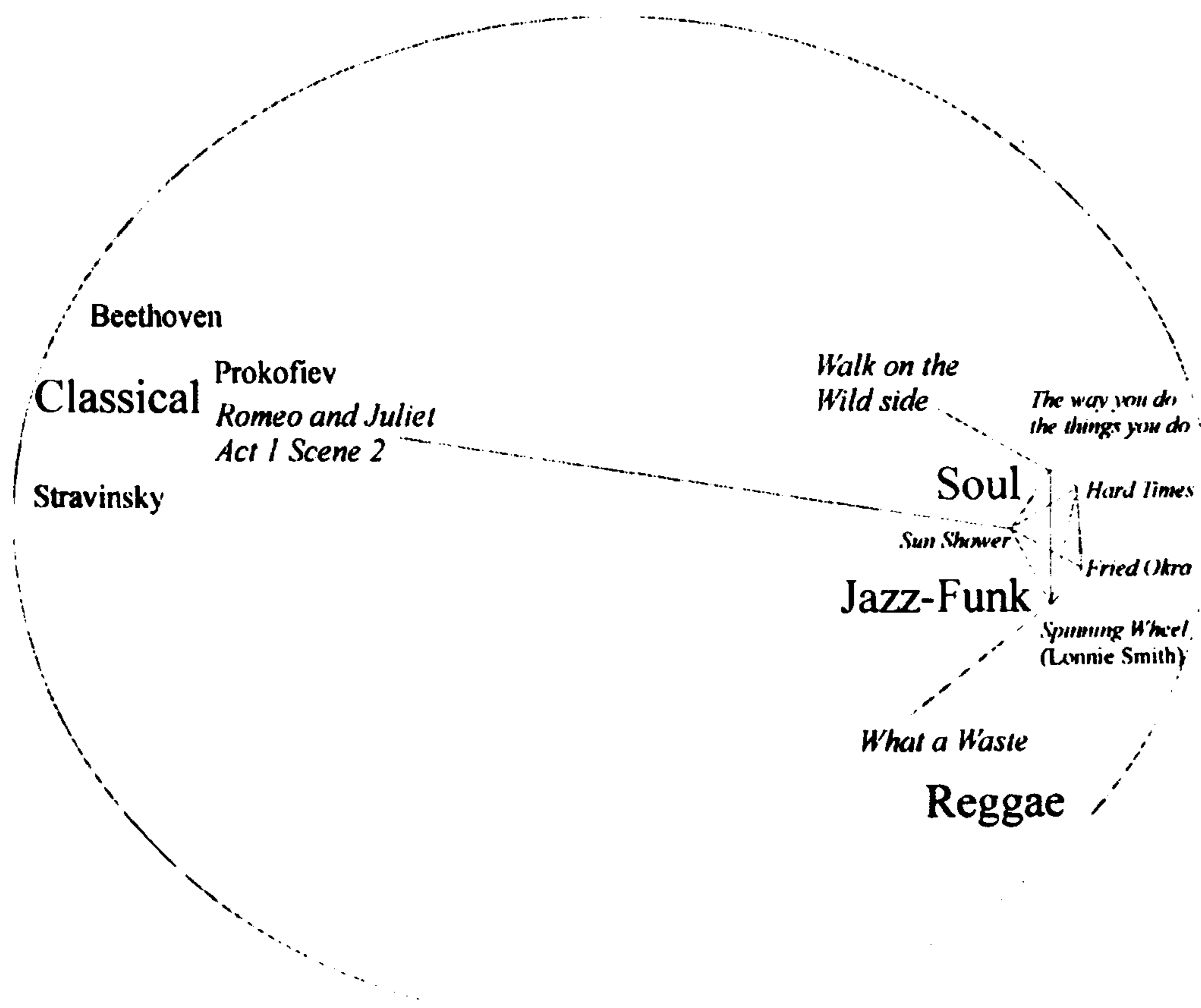
This musical score, labeled Ex. 6.11, is a multi-staff orchestral arrangement. The instruments and their parts are as follows:

- Brass:** Bsns. (Bass Saxophone) and C. Bsn. & B. Cl. (Cornet and Bass Clarinet) play a sustained chord marked *f*. Hns. (Horn) and Bass Tbn. (Bass Trombone) play a rhythmic pattern marked *f pesante*. Tba. (Tuba) plays a sustained chord marked *f pesante*.
- Woodwinds:** (E. Pno.) (English Horn) plays a melodic line.
- Keyboard and Rhythm Section:** Kbds & Gtrs (Keyboard and Guitars) and (E. Gtr.) (Electric Guitar) play a complex, rhythmic pattern. Bass (Bass) and Drum Kit (Drum Kit) provide the rhythmic foundation.
- Strings:** Vln. 1 and Vln. 2 (Violins) are silent. Vla. (Viola) plays a sustained chord marked *f pesante*. Vc. (Violoncello) and Cb. (Cello) play a sustained chord marked *f pesante*.

The score is written in a key with one flat (B-flat major or D minor) and a 4/4 time signature. The dynamic marking *f pesante* is used throughout to indicate a heavy, forceful sound.

By choosing samples from particular sources, the Tribe seek to influence listening as situation, a process which is ultimately different for each individual. For example, on first hearing, listeners who are familiar with the Lou Reed sample would hear it as foreign to 'Can I Kick it?', whereas those without that prior knowledge may not. Or perhaps (as in my own experience), they might listen to 'What a Waste' after having heard 'Can I Kick it?', their hearing of the Ian Dury song being conversely transformed. Depending upon listeners' previous experience, they will situate music in their own ways, and to different extents of precision. However, the juxtaposing of music from different styles implies – indeed, imposes – relative positions within musical geography for the samples, or at least relative distances between them. The diagram below is intended merely as a representational tool to elucidate discussion, rather than any kind of proposed 'map'.

Ex. 6.12:



'Can I Kick it?' is a clear and simple example of how composers might manipulate the situation process. All of the samples are integrated within the same formal network. Indeed, they are skillfully combined so as to create a continuous instrumental texture, excluding the Prokofiev. Thus, there is a stylistic 'cluster': the generic characteristics of the jazz-funk and soul samples form a composite hip-hop drumbeat upon which two foreign samples (of Lou Reed and Ian Dury) are superimposed and thus integrated. However, the situation is different for the bar of *Romeo and Juliet*, which is deliberately presented as an anomaly. Coming at the end of the song, it plays upon listeners' expectations by replacing the second half of the Dury riff (see Ex. 6.11). Since the Prokofiev shares (relatively) so few characteristics with hip hop, it is stylistically removed from all of the previous material: it goes above and beyond interrupting that temporal pattern, and implies a dislocation of style. Thus, one of the dynamics upon which 'Can I Kick it?' plays is that of stylistic distance. Hip hop is a clear example of how listening as situation functions. As samples are imported to new songs, they bring with them something of their original contexts, and as such they refer to something beyond themselves. However, that process of reference can be used far more subtly, as explained below.

Reference Points

'Reference' is used here to denote the conscious use of a stylistic musical other so as to influence directly the listener's process of situation. Thus, the term implies the directing of attention to an *other* which illuminates the present. Thereby meaning is negotiated by the relationship between the two: through awareness of the *other's* relevance, a fuller understanding of the present is gained. This could be applied to

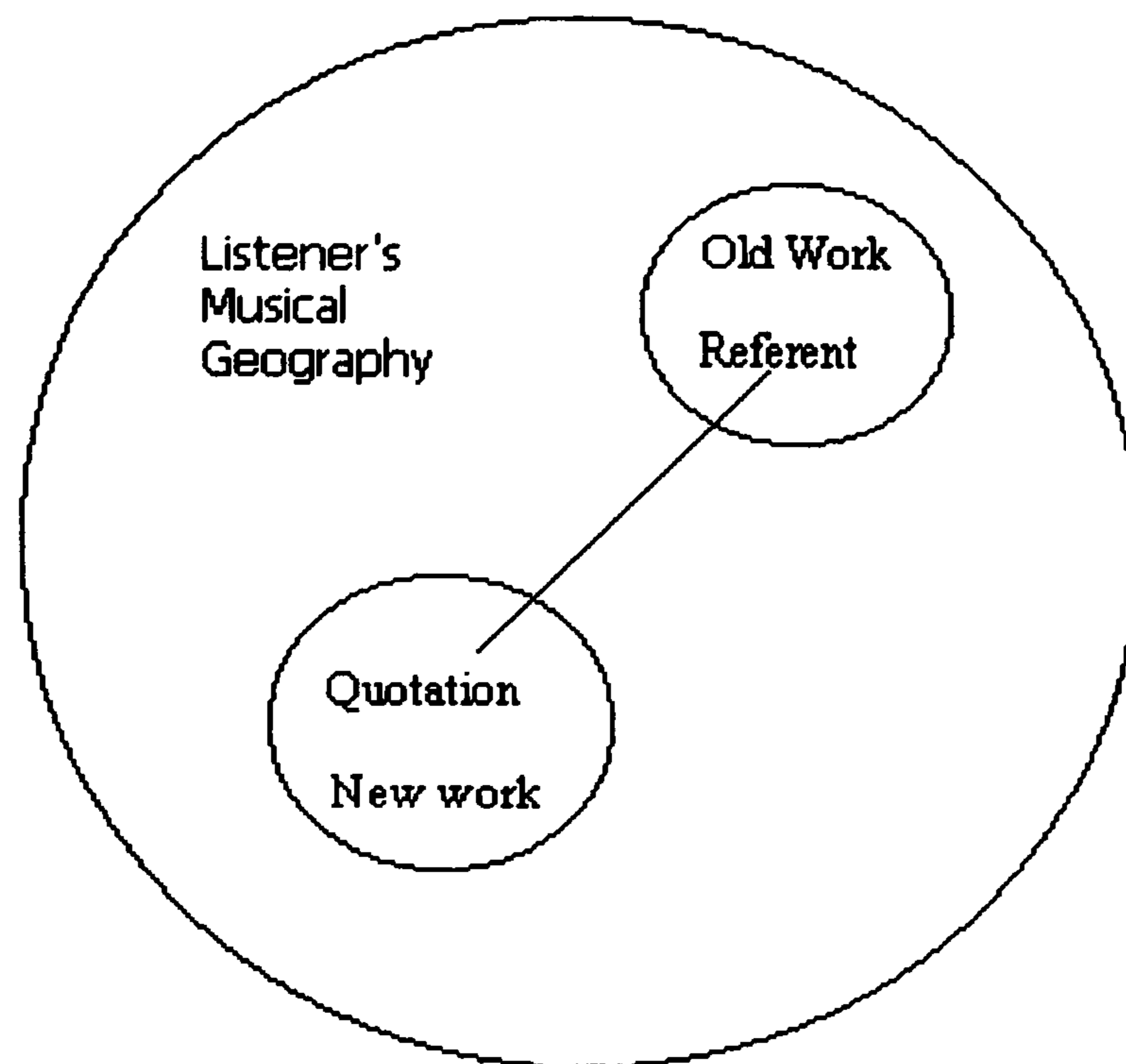
music in a number of ways. The 'other' and/or the 'present' could be an ornament, motif, work, style or even the use of a particular instrument. Further, since listening is fundamentally comparative, all musical communication could be said to be referential, in that given musical events are imbued with significance in relation to memories of other, previous ones. Yet there is an important difference between how this process functions within a piece, as opposed to within a style. In the former case, meaning is manifest as listener expectations for continuity, specific to the present work. In this sense, pieces of music are 'self-referential'; their constituent parts signify, or function, according to their relation to the whole. The basic premise of listening as situation is that certain events might have significance relative to *other* music, wherein lies their 'referential' meaning. Composers can play upon this by incorporating aspects of other music into their own. Broadly speaking, the determinant factor in this is style.

Since the notion of style might incorporate a combination of any or all aspects of material, reference could affect any part of the musical fabric. Ultimately, the significance of a reference is determined by listeners' abilities and predispositions to situate music. Thus in truth, 'inference' would be more suitable as a description of this communicative process, since individuals negotiate the relative significance of events within their own musical geographies. Again, it is impossible to comment on how this might occur for a given person since each individual negotiates his or her own meaning according to previous listening experiences. Yet within a given culture there are norms identifiable as belonging to certain style-systems as opposed to others. This observation formed a fundamental part of Meyer's thinking (Meyer, 1956). However, nowadays the notion of belonging to a particular musical culture is arguably weaker than it was in 1956, as contemporary listeners are increasingly exposed to a

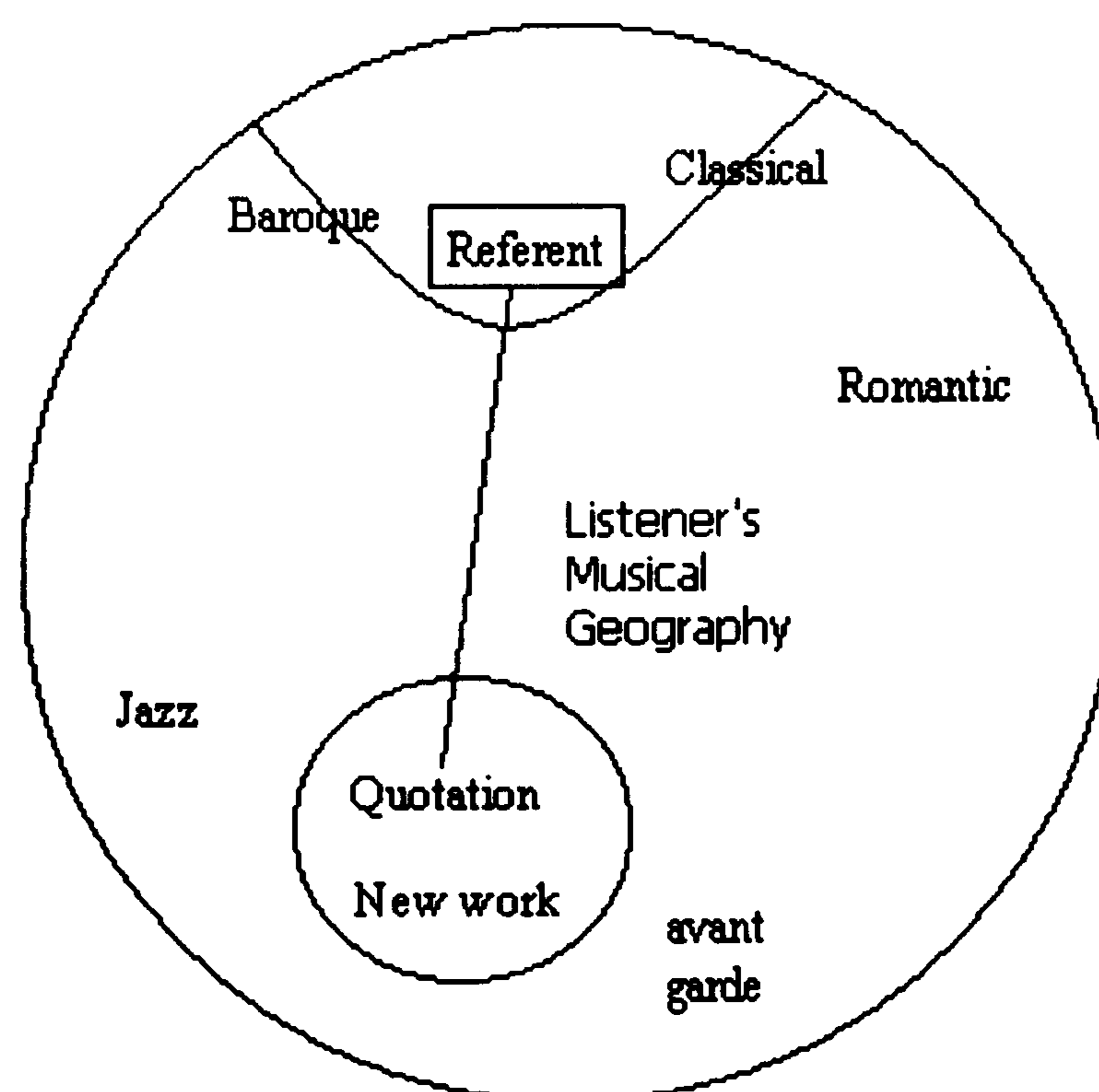
multiplicity of styles. Taken to its extreme, the implied weakening-process (increasing exposure to an ever-wider variety of styles) might result in a lack of norms, such that individuals could not be identified as members of any particular musical culture. Perhaps, given this lack of a unifying tradition in the music of the last 100 years, at some level twenty first-century listening is purely referential.

All musical objects have referential value since, inevitably, they can be considered in terms of style. There are even instances of single notes which can evoke *others*: a solo clarinet playing a sustained crescendo on a low note inevitably recalls Messiaen's *Quatuor pour la Fin du Temps* in qualified listeners' minds, evoking a specific event in a specific piece. Besides such instances, the very nature of style as a probability network means that it can be seen to be operational without necessarily creating an exact and defining connection between a musical object and a specific style. For example, a C major chord on the piano is typical within many Western styles, although it is far less probable in non-Western musics. Style functions to greater or lesser extents on a number of perceptual levels. This gives rise to a spectrum of different kinds of reference ranging from the general to the specific.

At one end of that spectrum is quotation. This is the most immediate and specific form of reference, since the two works are situated in direct relation with one another.

Ex. 6.13:

At the other end of the spectrum is allusion. Here, the referent might be recognised as belonging to a particular style, rather than a particular piece. It is situated less exactly within musical geography.

Ex. 6.14:

Certain things apply across the spectrum regarding the situation process as a mechanism for meaning. By using 'others', composers import and play upon their symbolic meanings. This is clear in the case of quotation: to use the tune 'Rule Britannia' specifically evokes British patriotism in the mind of any qualified listener. Further towards the general end of the spectrum, it is difficult for composers not to connote the military using a piccolo and snare drum as solo instruments. These are obvious examples. In each case, the 'other' cited is an established musical symbol for a specific extra-musical entity. Often the composers' intended meanings are far more subtle, as is the case with Stravinsky.

Stravinsky's *Symphony in C*

'A good composer does not imitate; he steals'.

(Stravinsky, quoted in Yates, 1967: 41)

Throughout his career, Stravinsky took models from other music and used them as the basis for his own compositions. By adapting his own style to each model, and vice versa, he made comment on the original which went above and beyond mere pastiche. Reference plays an important role in his works, whose meanings are grasped more fully and often very differently relative to their models, in comparison with their significance as stand-alone works. This composer makes an interesting case study from the point of view of listening as a dual process of construction and situation, as a preliminary to more extended examples in the following chapters. His 'neo-classical' period calls for particular attention, since this very label implies the sort of communication described above.

In the works between approximately 1920 and 1950 Stravinsky chose particularly well-defined and often genre-specific models, writing concerti.

symphonies and opera. These genres have clear connotations for musical content and the way it interacts, and furthermore they carry a certain cultural *gravitas*; they are products of a 'classical' age when Great Composers wrote Masterworks. The piece chosen for discussion here is the *Symphony in C*, the implications of whose title Stravinsky was acutely aware. In his *Poetics of Music* (1942, contemporaneous with the *Symphony*) he said

Of all the musical forms, the one considered the richest from the point of view of development is the symphony. We usually designate by that name a composition in several movements, of which one confers upon the whole work its symphonic quality - namely the symphonic *allegro*, generally placed at the opening of the work and intended to justify its name by fulfilling the requirements of a certain musical dialectic. The essential part of this dialectic resides in the central portion, the development. It is precisely this symphonic *allegro*, which is also termed the sonata-*allegro*, that determines the form upon which ... all instrumental music is constructed ...

(Stravinsky, 1942: 41-2)

Here the composer speaks of the reverence in which this genre, a platform for developing musical ideas, is held, as well as the traditional importance of its first movement and the sonata form in which it is cast. This suggests a specific line of enquiry, namely as to the relationship between the *Symphony in C* and the classical Symphony, both as a musical form and as an iconic artifice. This is a particularly interesting comparison from the point of view of musical norms and deviants. As well as implying a range of (eighteenth/nineteenth-century) styles, 'Symphony' is a tradition in which many composers have written, found innovations, expanded forms. Thus, there is no fixed model; the referent is unspecific. There are, however, iconic works by (the aforementioned) Great Composers which are generally held to attain to the idealised concept of the 'Symphony': Beethoven 5, Mozart 40, etc. Furthermore, Stravinsky himself explains, there is a trend within this tradition of casting all-important opening movements in sonata form. The *Symphony in C* contains many

references to these models on levels ranging from the general and global to the specific and local.

In his article 'The Uses of Convention: Stravinsky and his models' (1962), Edward T. Cone proposes the following formal divisions for the first movement of *Symphony in C*, recognising a global reference to sonata form (shown in the labels given to the sections).

Ex. 6.15:

<u>Sonata form</u>	<u>No. of bars</u>	<u>Bar number</u>
Introduction	25	1
Theme 1	34	26
Transition	34	60
Theme 2	58	94
Development	67½	152
Recapitulation A	56½	219½
Recapitulation B	34	276
Coda A	34	310
Coda B	25	344

The table does not show how this music relates to its model, it merely gives its proportions and says something of the distribution of material. In fact, this being a reference to, rather than an example of sonata form, there are inconsistencies with convention even in the table above. As Karallus says in the preface to the score,

It differs [from the formal scheme of the classical sonata] ... in its transformation of the sonata scheme into a three-part, symmetrical form and through the arrangement of the inner proportions in such a way as to produce a cyclical construction: with the Introduction and second part of the Coda as the shortest and the central Development as the longest of the nine sections

(Karallus, 1984: V)

Given Stravinsky's comment above, the presence of an extended development section is hardly surprising, yet this is slightly misleading. In sonata-form terms, the length of the development section as identified above should be compared against all of themes

1, 2 and the transition between them (as the exposition), and both recapitulations as a single entity. This suggests that perhaps Cone's proposed model has limitations.

Of course, the traditional symphonic first movement is not actually defined by its proportions. Its form is more recognisable in tonal terms, taught in schools as the resolution of the initial tension caused by modulating to the dominant for the second subject. Again this music betrays its supposed model. By rights, theme 2 (the second subject) should be presented in G major, the dominant of C. Yet, starting proper in bar 106 (rehearsal figure 21), it could not possibly be any more firmly rooted in the home key. After a transitory passage in the subdominant, F major, the horn enters in the tonic (see Ex. 6.16):

Ex. 6.16:

The image shows a musical score for rehearsal figure 21, which is a transition from the first subject to the second subject. The score is divided into two systems. The first system shows the first subject in C major, with a horn solo in the tonic. The second system shows the second subject in C major, with a horn solo in the tonic. The score includes parts for Flute 1, Flute 2, Clarinet, Bassoon, Trumpet, Trombone, Violin 1, Violin 2, Viola, Violoncello, and Contrabass. The key signature is one flat (F major/C minor). The time signature is 3/4. The score is marked with 'Solo', 'ben marc.', 'p', and 'poco sf'.

According to the convention described above, the movement is denied its very *raison d'être*, the tonal conflict inherent in the opening dominant modulation. Again, this throws the appropriateness of a sonata-form reading into doubt. This is after all a symphony 'in C', yet the lack of any modulation at all would seem to undermine the dramatic basis of the form, making the 'symphonic' label questionable. Yet there is an undeniable feeling of suspense in the bars approaching theme 2. Starting in bar 74,

there is a pedal D (the dominant of the dominant, G), which is doubled at five octave transpositions over the course of the following 20 bars – hardly music with no sense of purpose. In the event, however, rather than resolving to G, this suspense is ‘deflated’ by resolution to an A major chord and a rather deliberately limp woodwind gesture, followed by material in the subdominant, F.

Ex. 6.17:

The image displays two measures of a musical score, labeled 18 and 19, with an arrow pointing from measure 18 to measure 19. Measure 18 shows a piano part with a 'pedal D' (dominant of the dominant, G) and a woodwind part. Measure 19 shows a resolution to an A major chord and a woodwind gesture, followed by material in the subdominant, F.

For a composer as aware of tradition as Stravinsky, this is not a negligible inconsistency with his model. Having set up that change of key, his refusal to adhere to tonal convention is a conscious comment on sonata form. Rather than referring to that model as a tonal structure, *Symphony in C* presents it as an arbitrary dramatic framework, trivialising modulation to the dominant – the very cornerstone of the symphonic tradition. In fact, Stravinsky goes further than this. At the end of the movement, the message seems to be that this ‘richest of musical forms’ is inadequate even as a template for drama.

Traditionally, the function of the coda (pre-Beethoven) is to reflect the definiteness of the preceding resolution. It provided a note of triumph (that of the tonic over the dominant) or of relief (at the resolution of tonal tension). Either way, its dramatic purpose was to acknowledge and certify the finality of the end of the movement. Yet there is a restless feeling to Stravinsky's coda which pervades to the extent that a second one is required. After the first failed attempt at a close, the music continues with an incessant E and G pedal in the second violins and violas. Unlike a dominant pedal, there is no obvious place for this to resolve: these notes constitute the lesser two thirds of the tonic triad (they also go to make up an E minor triad, a typically Stravinskian pun used as the basis for the harmonic and tonal structure of the movement). In the end they are 'resolved' unsatisfactorily, with the addition of a low C in the bassoon (bar 358), which also marks the end of a downward registral shift. Coda B starts with a high, vital flute solo, and (save the last five bars) finishes exhausted, four octaves lower (see Ex. 6.18).

Ex. 6. 18:

The musical score for Ex. 6.18 is divided into two systems. The first system, starting at bar 69, features five staves: Fl. 1, Cl., Fls. 2&3, Violin 2, and Viola. The Fl. 1 part has a melodic line with a dynamic marking of *p*. The Fls. 2&3 part has a rhythmic pattern of eighth notes with a dynamic marking of *p*. The Violin 2 and Viola parts have a rhythmic pattern of eighth notes with a dynamic marking of *p*. The second system, starting at bar 71, features five staves: Oboe, Bassoon 1&2, Violin 2, Viola, and Violoncello. The Oboe part has a melodic line with a dynamic marking of *sempre p*. The Bassoon 1&2 part has a melodic line with a dynamic marking of *pp*. The Violin 2 and Viola parts have a rhythmic pattern of eighth notes. The Violoncello part has a melodic line with a dynamic marking of *p ma marcato* and a *pizz.* marking.

Indeed, rather than a sense of resolution, this passage is characterised by resignation; there can be no finality due to the lack of a tonic-dominant opposition. Thus the closing bars are imbued with a feeling of frustration. According to convention they ought to contain a chain of perfect cadences, or simply tonic chords. Yet instead they contain superimpositions of C-major-seventh chords and E minor triads, neither of which fully attains to prominence, as though however hard Stravinsky pushes, the final jigsaw piece will not fit.

Symphonic openings and Beethoven's legacy

Perhaps one of the reasons Symphony became the 'richest of musical forms' is its highly public and purely musical nature. At the start of a performance the orchestra sits *en masse* facing a large audience, who settle down and mentally prepare to listen to an idea unfold over an extended period of time. Certainly there are other classical genres on a similarly large scale, yet these are less 'pure' forms: an extra-musical sense of drama is inherent to both Opera and Concerto, in addition to their implicit display of performers' virtuosity. In a way, Symphony evolved as a forum for compositional talent; its emphasis on development makes it a platform for musical imagination and inventiveness. That is not to deny it a sense of drama, however. Two large groups of people silently facing each other inevitably creates tension, particularly when expectations of a profound (or at any rate, development-rich) dialectic are added to the equation. This makes a particularly significant moment of the opening of a Symphony. The composer can ease, increase, or release the silent tension at the same time as exposing material to be developed.

Stravinsky was clearly aware of this opportunity: many of his pieces begin with famously distinctive gestures. The bassoon at the start of *Le Sacre* is iconic, yet

more significant here are those works with 'symphony' in the title: the high bare fifths of *Symphonies of Wind Instruments* (1920); the immediately recognisable *Psalms* chord; and presently, in a slightly perverse way, the opening figure of the *Symphony in C* (see below). In using the social context of the concert hall like this, he was referring to a model. One of the first composers to take advantage of the symphonic opening in any real sense was Beethoven.

It is hard to imagine the sensation experienced by the audience at the première of that composer's First Symphony. The *immediate* dissonance of the unprepared, opening 'dominant 7th' chord with which it begins was unprecedented in the symphonic tradition in 1800. This kind of initial disorientation characterises a number of the following eight symphonies: the melodic movement to C# at the end of the first phrase of *Eroica*, for example, or the rhythmic and tonal characteristics of the start of the Fifth. Aside from their musical qualities, these two moments are also notable for their cultural status and their dramatic connotations. Their inherent tonal ambiguity, alongside their expressive nature, prevents listeners from being allowed to settle, instead plunging them straight into a point of crisis in the later work, and a state of foreboding suspense in the other. This kind of emotionally charged music was typical of Beethoven, and meant that by the 1820s,

... the musical public had a massive emotional investment in his music; he was acknowledged throughout Europe as the greatest composer of his day, and perhaps that the world had ever known. And so his many devotees set themselves to work at understanding his music in a way that audiences had perhaps never worked at understanding music before.

(Cook, 1998a: 22)

His symphonies, the purest forum for his talent and experiment, became iconic and worthy of study as models. Beethoven left a huge symphonic legacy; his influence expanded, developed and elevated this genre from the Haydn model to the vast expanses of Mahler. Yet aside from any architectural or other musical imprints left by

him, the reverence in which the genre is held has perhaps proved the longest-lasting influence.

Already by the second quarter of the nineteenth century, composers were keenly aware of Beethoven's shadow. Their anxiety, moreover, was intensified by the growing aesthetic importance of originality. Novelty and innovation had already played at least some role in the aesthetics of music, but towards the end of the nineteenth century originality began to assume unprecedented importance. No longer a merely desirable quality in a work, it was now considered an essential criterion of value, particularly in as weighty a genre as the Symphony.

(Bonds, 1996: 5)

There is an added layer of historical significance to the beginning of a Symphony. That term connotes a piece worthy of belonging to the tradition in which the Great(est) Composer(s) wrote, and during the moments before it starts, post-Beethovenian listeners expect a certain sense of purpose from what they are about to hear, and are pre-disposed to receive the opening gestures as such. Composing the beginning of *Symphony in C*, Stravinsky faced far more than a blank sheet of manuscript paper. His opening statement answers Beethoven directly.

The first bar (see Ex. 6.19) could hardly purport to be any more important: a single note is repeated seven times spanning five octaves, rising in intensity towards the first discernible point in time of the *Symphony*, the succeeding downbeat. Growing as it does out of the silence, it is effectively joined together with the preceding tension (and, perhaps, 300 years of Beethovenian influence) and made to act as a single upbeat to the next bar. In acknowledging the gravity of the situation, Stravinsky goes beyond paying his respects to tradition. This figure is a remarkably subtly conceived reference to arguably the most well-known symphonic opening: Beethoven V.

Ex. 6.19:

The image displays a musical score for Ex. 6.19, featuring several orchestral parts in 2/2 time. The parts are arranged as follows:

- Flute (Fl.):** Treble clef, starting with a rest, then playing a quarter note G4 (mf) and a quarter note A4 (f).
- Clarinet (Cl.):** Treble clef, starting with a rest, then playing a quarter note G4 (f).
- Bassoon (Bsns.):** Bass clef, starting with a rest, then playing a quarter note G3 (mf) and a quarter note A3 (f).
- Horns (Hns.):** Treble clef, playing a half note chord of G3 and B2 (p), then a half note chord of G3 and B2 (f).
- Timpani:** Bass clef, playing a half note chord of G3 and B2 (p), then a half note chord of G3 and B2 (f).
- Strings:** Treble and Bass clefs, playing a half note chord of G3 and B2 (p), then a half note chord of G3 and B2 (f sub.).

To the right of the main score, there is a smaller score for Clarinet (Cls.) and Strings, both in 2/4 time with a key signature of two flats (Bb, Eb). The Clarinet part plays a quarter note G4 (ff) and a quarter note A4. The Strings part plays a quarter note G3 (ff) and a quarter note A3.

There are obvious rhythmic, melodic and orchestral similarities. Indeed, the choice of C as (nominative) tonal centre is not without significance. Yet it would be a disservice to this music to suggest that the full extent of its meaning lay in its similarities with another work. The subtlety of its conception lies in the fact that it is *not* the opening to Beethoven V. To start with a quotation would have given *Symphony in C* a definite, and effectively 'closed' meaning. Instead, there are relationships between it and the themes to two other iconic symphonies: Beethoven I and Mozart 40.

Ex. 6.20:

The diagram illustrates the intervallic relationships between four musical themes. At the top left is the theme from Mozart 40, with an intervallic profile below it showing a semitone between the first two notes and a major third between the last two. At the top right is the theme from Beethoven V, with an intervallic profile showing a semitone between the first two notes and a major third between the last two. In the center is the theme from Stravinsky's *Symphony in C*, with an intervallic profile showing a semitone between the first two notes and a major third between the last two. At the bottom left is the theme from Beethoven I, with an intervallic profile showing a semitone between the first two notes and a major third between the last two. Dotted lines connect the intervallic profiles of Mozart 40 and Beethoven V to the profile of Stravinsky's *Symphony in C*. A solid vertical line connects the profile of Stravinsky's *Symphony in C* to the profile of Beethoven I.

The relationships shown above differ in terms of the extent of their similarity: the older themes are comparatively more, or less, closely related to the Stravinsky. Clearly, the Fifth corresponds most strongly. It is a short gesture announcing a symphony, characterised most distinctively by its rhythmic qualities and the drop of a major third. The earlier Beethoven (I) theme has a looser relationship with the present *Symphony in C*: the notes C-G-B form a rapid series of short notes, although they appear as part of a longer theme occurring after an introduction. Less aurally apparent still is the similarity between the Stravinsky and the Mozart. Indeed the only real point of semblance here is intervallic profile: they use different degrees of the scale, are rhythmically quite distinct and are directionally opposite. On this basis it is difficult to justify the idea that this particular relationship is in any way referential. Perhaps this calls the validity of Ex. 6.20 into question; it is arguable that these observations are merely happy coincidences. The significance of these relationships is that,

conveniently or otherwise, they exist, and as such form part of this comment on the symphonic tradition, in which the other works are cited as signal achievements.

Stravinsky was surely aware of these similarities. Just as the global form of this movement subverts the functionality of its model, so does its opening. Ex. 6.20 shows how this figure might be situated, in the context of the Great Symphonies. It is all the more interesting therefore that this motif subverts its scale-degree function, emphasising the leading note over the dominant and tonic. Thus, this figure is iconoclastic: at the same time as paying its respects to the austerity of the occasion, it deflates the grandeur of the symphonic tradition.

More evidence of this sort of agenda is apparent later in the movement with the appearance of the first theme in passages such as the following:

Ex. 6.21:

The musical score for Ex. 6.21 consists of six staves. The top staff is for the Oboe (Ob.), marked '1. Solo' and 'p'. The second staff is for Violin 1 (Vln. 1), which has a rest followed by a short melodic phrase marked 'p'. The third staff is for Violin 2 (Vln. 2), playing a rhythmic pattern marked 'p leggiero'. The fourth staff is for Viola (Vla.), also playing a rhythmic pattern. The fifth staff is for Violoncello (Vc.), and the sixth staff is for Contrabass (Cb.), both playing a rhythmic pattern marked 'p (secco)'. A box with the number '5' is placed at the beginning of the Oboe staff.

There are two relevant models here, Beethoven I and Mozart 40. Of the two, the latter is more immediately apparent on account of its texture. The example above is practically a quotation from the *Symphony in G Minor* and has a similarly strong suggestion of the minor mode.

Ex. 6.22:

The intervallic similarities between the themes of each symphony are shown above in Ex. 6.20, yet an important difference between them is tonal function. Mozart's melody establishes the key of G minor, being structured around its triad, outlining different versions of that scale, and supported by a I-ii⁷-V⁷-I progression in that key (see Ex. 2.1). However, Stravinsky's is not functional in either C major or E minor; it states various degrees of the scale such that any sense of either key is subverted, with no implication for change in the underlying harmony. When one does occur, it comes in the form of a subversive reference to Beethoven I, as Cone notes.

[An] example of ... new perspective on older procedures is the presentation of the first theme, recalling as it does Beethoven's First Symphony with its I-II-V sequence. With Beethoven the movement from each degree to the next is a clearly functional harmonic step; with Stravinsky these movements sound less like harmonic progressions than like his characteristic harmonic shifts.When Stravinsky's dominant arrives (m. 48) it is heavily coloured by the previously noted E. What we hear then, suggests the stepwise shift of I-II-III as an alternate and even more persuasive interpretation of an ostensibly functional I-II-V.

(Cone, 1963: 26)

In a way, the movement is a composing out of latent references inherent in its opening.

Referential meaning and Symphony in C

The issue of relationship to tradition is a central pillar of Stravinskian scholarship and is important in understanding listening as situation. *Symphony in C* is a subversive reference to the Classical Symphony, not an example of one. This is made clear by implication at various points during the movement: the building of tension towards the 'second subject', the Mozart-texture of the first, the disfunctional codas. Notably, these are events which articulate the sonata-form pattern: the music assumes a different position in relation to its forebears at recognisable structural points. To a certain extent, referential meaning is dependent on structure as well as style.

Arguably, one of the most significant points of articulation in musical structure is the opening. The referents at the start of this symphony are explained in some detail above, yet it is important to recognise their symbolic meaning as well as musical implications. In fact, the Stravinskian figure in Exx. 6.19&20 seems to signify on three distinct yet thoroughly interwoven levels simultaneously. Effectively, it makes reference to:

- a **particular symphony** – it sounds like Beethoven V
- a **symphony** – its tonal ambiguity is reminiscent of those in Beethoven's canon
- the **Symphony** – it has the gravitas and sense of purpose associated with that genre arising from generations of composers defining themselves in relation to Beethoven.

The principle distinction between the three levels is their varying degrees of specificity. In the first instance the referent is a particular piece; in the second, a set of nine works; and in the third, the generic characteristics of a body of over 200 years of composition. From this point of view, there are a number of potential referents intimated here, as discussed above. Yet this is nothing special. There is no shortage of

pieces with ambiguous openings; Stravinsky is not the only twentieth- or indeed nineteenth-century composer whose output stands as testimony to that. Furthermore, most music is reminiscent of a variety of other pieces. It is important to rationalise reference as a concept, in order to understand how it functions to communicate meanings more specific and complex than simply music which 'sounds like...', or 'reminds me of...'. Otherwise, *Symphony in C* merely becomes a (rather inaccurate and inconsistent) pastiche.

The above suggests that this opening actually functions on three simultaneous levels of referential meaning, as shown below.

Ex. 6.23:

Level	Name	<i>Symphony in C</i> refers to...	Comment	Characteristics of typical meanings communicated
1	Content-based	a particular symphony	'That sounds like...': the 'other' musical context evoked by the present	specific to a certain piece
2	Musico-contextual	a symphony	How the reference functions within its new musical context in comparison with its other (original) context	typical of a given style or piece
3	Contextual	the Symphony	the affective, or associative product of the situation process	extra-musical

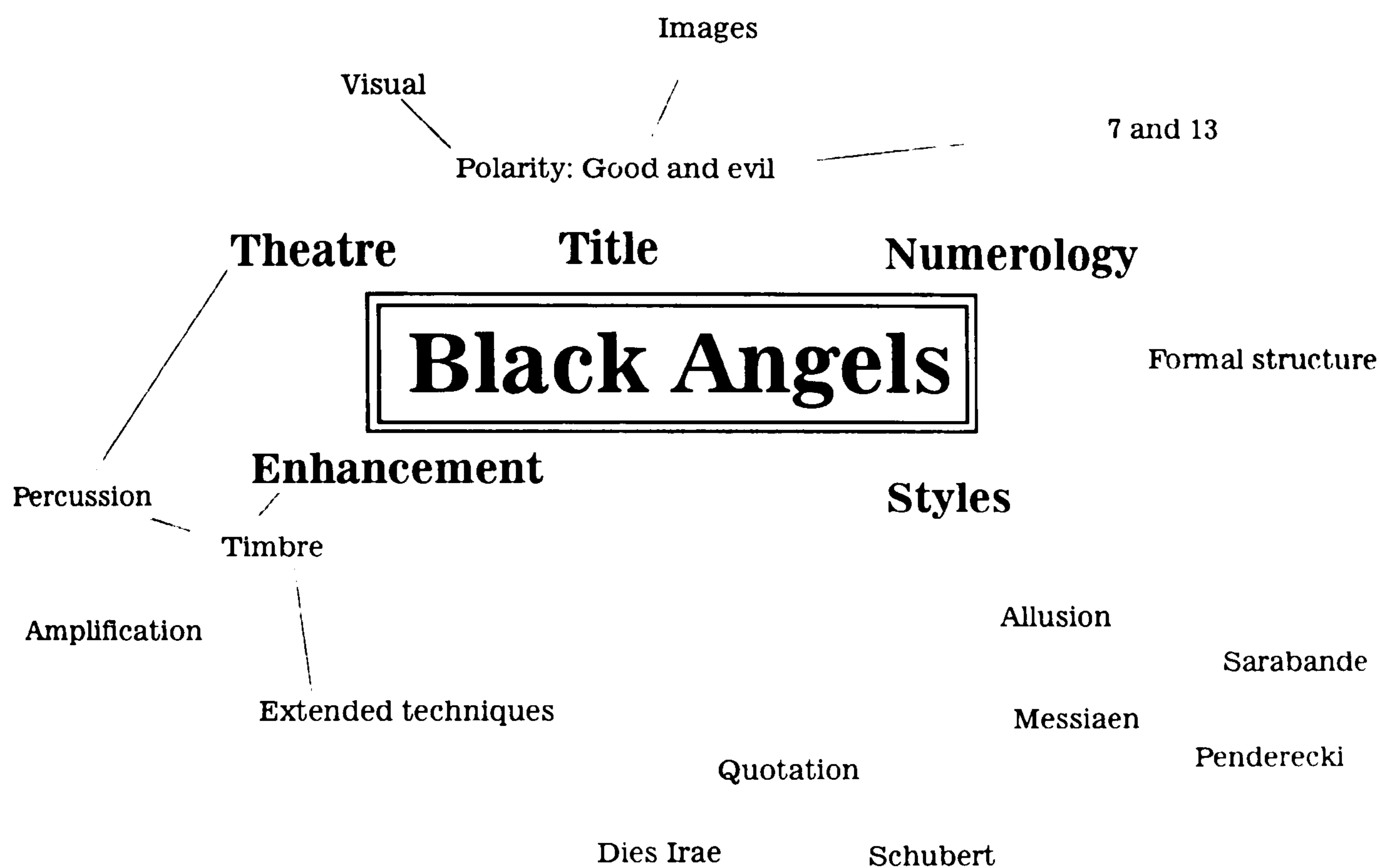
The first is content-based; its operation depends upon the rhythmic, melodic, immediate harmonic, and orchestral similarities. As the basis of comments such as 'it sounds like...', this is the most simple, direct, and specific means of communication by reference. Importantly, those named features should be regarded as distinct from the idea of using tonal ambiguity at the opening of a symphony, since they do not have consequences for higher-level structure, which belongs on the second level. This might be described as musico-contextual; it regards how the interaction between form

and content is itself used as a reference. The two gestures in Ex. 6.19 carry similar musical (harmonic, rhythmic, melodic) implications for the respective contexts in which they are presented. This is different from similarities in their content-based *characteristics* since it has to do with the larger-scale function of each figure. The final layer might simply be called contextual, since it concerns how listeners situate what they hear independently of the immediate musical experience. In this instance it is the *gravitas* of the symphonic tradition which is evoked on this third level, as described above. It is on this level that the *Symphony in C* can be considered to make reference to the tradition with which it is associated, as opposed to being an example of the body of works to which it belongs.

Chapter 7

Reference Points Outwards: George Crumb's *Black Angels*

Ex. 7.1:



There are those who would call Mr. Crumb's music theatrical, and not in the flattering sense. They would add that the attempt is not to move and satisfy but to amaze.... as if the composer were...bent on the thrill of the moment but devoid of any deeper sense of order. Believers might argue that there are other kinds of order than the arrangements of notes into linear and vertical groups. They would propose that the knockout sonority can be every bit as profound as Mozartian sonata form.

(Holland: 2002, on-line, accessed 13 September 2007)

Ex. 7.1 is deliberately chaotic. The product of a brainstorm, it is a network of many different types of element, and there is a marked lack of equivalence between those types. In keeping with the theatrical nature of George Crumb's music in general, it is fitting to have started with some kind of explosion. Indeed, such an opening gesture is more appropriate still here, given the widely recognised Vietnam-war connotations of his work *Black Angels* (1970) – the score itself is marked 'George Crumb (in tempore belli)'. Arnold cites it as the only well-known piece of art-music 'to have emerged from or about the war', although he later explains that in fact, the work is 'an outgrowth of the Vietnam age and not particularly about it' (Arnold, 1991: 326). Similarly, the present chapter has its roots in considering this quartet as a communicative artifice as opposed to a political message-carrier. Rather than discuss the details and content of intended extra-musical meaning, the focus here is on how it is conveyed. As far as Vietnam is concerned, the ideas which are evoked offer listeners a means to reflect upon the tragic nature of military conflict: this is an *anti-war* piece, and suitably, Crumb seeks to communicate by presenting oppositions, by inviting listeners to find meaning in stark musical contrasts.

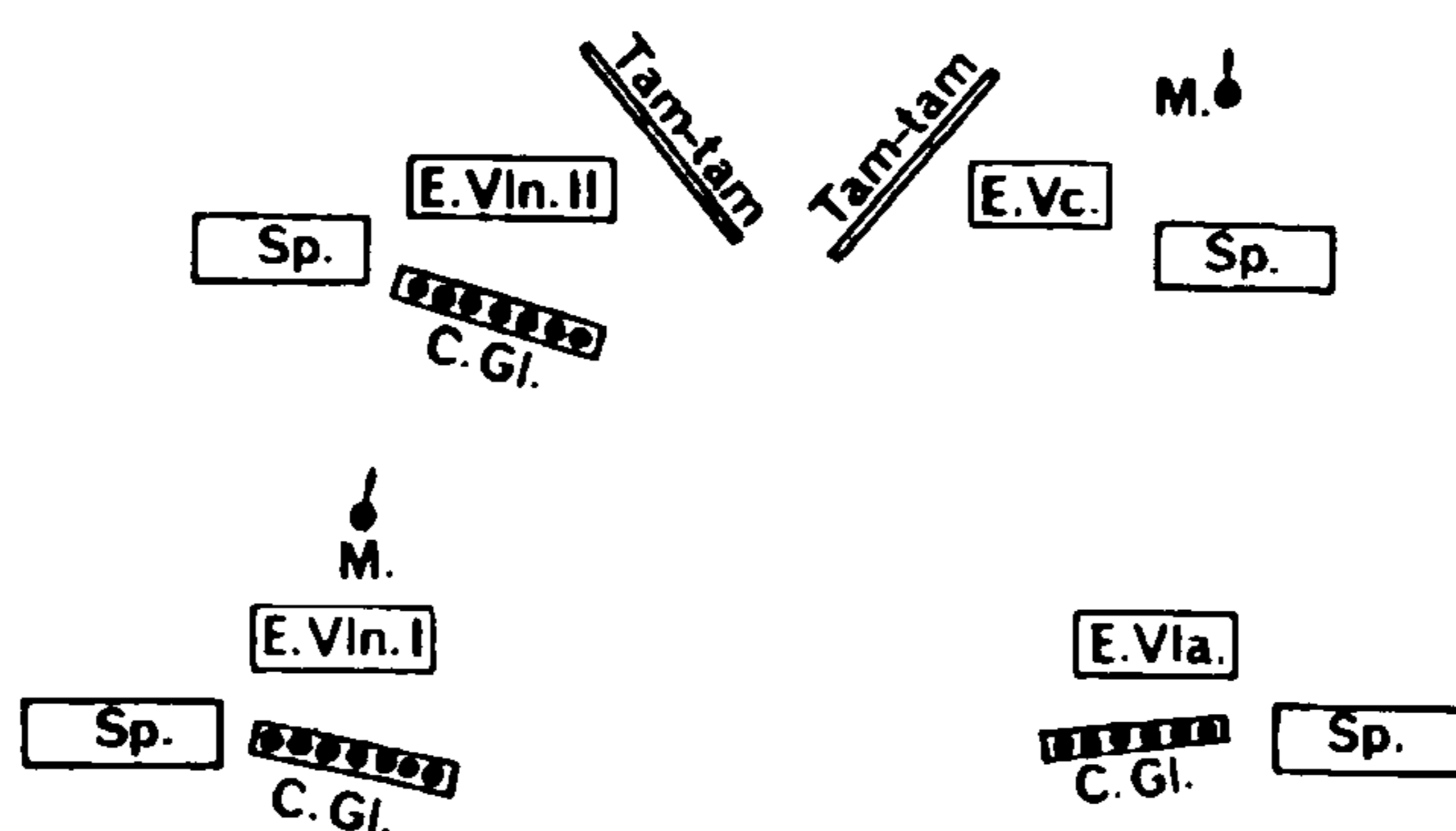
There is much juxtaposition in this piece, as many different kinds of significance are presented side by side. For example, it is difficult to conceive how timbre and numerology might be related, outside of – indeed, initially, within – this context, although both play an important part in bringing about Crumb's desired effect. It could be argued that this is the least well-*constructed* of all the works surveyed here: there is no real motivic structure to speak of, for example, and the notion of establishing and manipulating patterns within listeners' perceptions of specific sound events seems to have played, at best, an unimportant role in its composition. Certainly, this chapter is not an attempt to show that *Black Angels* is

‘every bit as profound’ as Mozart’s *Symphony in G minor*, as Holland might expect it to be, given the quotation at the start of the chapter, nor does it represent a desire to convert the readers into believers in any ‘other kind of order’. Rather, the present purpose is to illustrate the situation process, in an example of highly referential music. As reflected in Ex. 7.1, many seemingly disparate ideas emanate from the piece. By pointing to things outside of itself, *Black Angels* provides listeners with a means of ordering that chaos, and the manner in which that process occurs is the subject for debate. Arguably, these extra-musical associations serve to enhance the meaning in, and of, the work.

Enhancement is crucial to the communication process in *Black Angels*. Many of the things in this work are presented as exaggerated versions of what they would be according to convention. For example, amplification transforms the ensemble into an ‘Electric String Quartet’. Further, in addition to playing their standard instruments, the performers are required to shout and whisper in a number of languages, to whistle, and to play various percussion instruments: tam tams and pitched crystal glasses are bowed and struck in the course of a performance. A number of extended string techniques are also used. Players use glass rods to stop their strings as well as thimbles to strike them, and at various points they are required to bow on the ‘wrong side’ of the left hand, whilst holding their instruments ‘in the manner of viols’. The resulting viol-consort sonority, and pose, emphasises the importance of the relationship between sounds and images in this work. Indeed, quite apart from the timbral implications of all these enhancements, they have a significant impact upon its visual presentation. It is clear from a single glance at the performance space that this is not a conventional ensemble, as the traditional string quartet is itself ‘exploded’ (see Ex. 7.2).

Ex. 7.2:

STAGE POSITIONING



(Sp.= Speaker, C.Gi.=Crystal Glasses, M.=Maraca)

Black Angels plays upon the theatrical element of the concert format in a way that more conventional pieces do not. The presence of added resources – the tam tams in particular, with their theatrical connotations (of being struck) – provides visual cues, intensifying the expectations of the audience. It might even be argued that in a live performance watching is as integral as hearing. Moreover, the importance of the visual is reflected in the title of the work, as well as in its appearance on the stage.

What's in a Name?

'The image of the 'Black Angel' was a conventional device used by early painters to symbolize the fallen angel'

(The Official George Crumb Home Page,
Compositions: [n.d.], accessed 13 July 2008)

Since Crumb's inspiration in naming this piece lies in the symbolism of a bygone age, it comes as little surprise that the same is true of the music he has written. Tritones abound, representing the 'diabolus in musica'; and, as explained below, there is an elaborate numerological scheme. However, rather than be sidetracked into discussing

the history of such rhetoric, the present purpose is to consider how the choice of title serves to inform the listening experience.

In full, the work is called '*Black Angels – Thirteen Images from the Dark Land – [Images I]*'. In addition to the specific visual-arts motif of the main title, the notion 'image' runs rampantly through both subtitles. Clearly, the composer's intention is to conjure up pictures in the minds of his listeners using this title, rather than to provide information as to how the sounds he has notated might cohere. Thus, importantly, the end product of this kind of communication is not manifest musically – as imagined (or remembered) relationships between sounds – but extra-musically, as associations between sounds and imaginary visions. Nevertheless, these subtitles do inform the listening experience, offering information as to how the work might be situated. In combination with a highly elaborate programme note naming each of the thirteen movements and indicating their numerological significance, the dramatic (even theatrical) tension of '*Thirteen Images from the Dark Land*' suggests that it should be understood as programme music and thus affiliates it with a long-standing nineteenth-century tradition. Indeed, that connection is played upon by using references to works by Saint-Saëns and other music of that era.

The second subtitle, *Images I*, in addition to its Debussyan connotations, situates the work quite directly within Crumb's own output as a whole. *Dream Sequence (Images II)* features an offstage glass harmonica, in line with the crystal glasses of *Black Angels*, and there is a third in the series: *An Idyll for the Misbegotten (Images III)*. Such subtitled links are numerous; besides the *Images*, there are other groups of ensemble pieces, *Echoes I&II* and *Night Music I&II*, and the piano works *Makrokosmos I-IV* (a direct reference to Bartók's *Mikrokosmos*). It is beyond the scope of the present remit to explain in detail how these relationships are manifest.

although it is worth noting that these few extra-musical ideas – echoes (with connotations of the past, and quotation), night, and the cosmos – recur frequently within the titles of Crumb's oeuvres. Indeed, (as shown in Ex. 7.3, below) there are 'echo' and 'night' movements included in *Black Angels*.

Essentially, these extra-musical attachments are entirely dependent for their appreciation on the dispositions and qualifications of listeners. Ultimately, there is nothing inherently 'nocturnal' or otherwise about any particular sound, unless by association. However, at some level the title might be taken as a comment on substantive relationships between musical materials. '*Black Angels*' is paradoxical, as it encompasses both elements of a binary opposition, black and white. Accordingly, the piece contains highly contrasted materials. However, rather than being manifest in terms of a Mozartian tonic-dominant polarity, or a Stravinskian difference in serial derivation, the oppositions between them operate largely in terms of style.

Getting with the programme: what's in a number?

Black Angels was conceived as a parable on our troubled contemporary¹ world. The work portrays a voyage of the soul. The three stages of this voyage are Departure (fall from grace), Absence (spiritual annihilation) and Return (redemption)

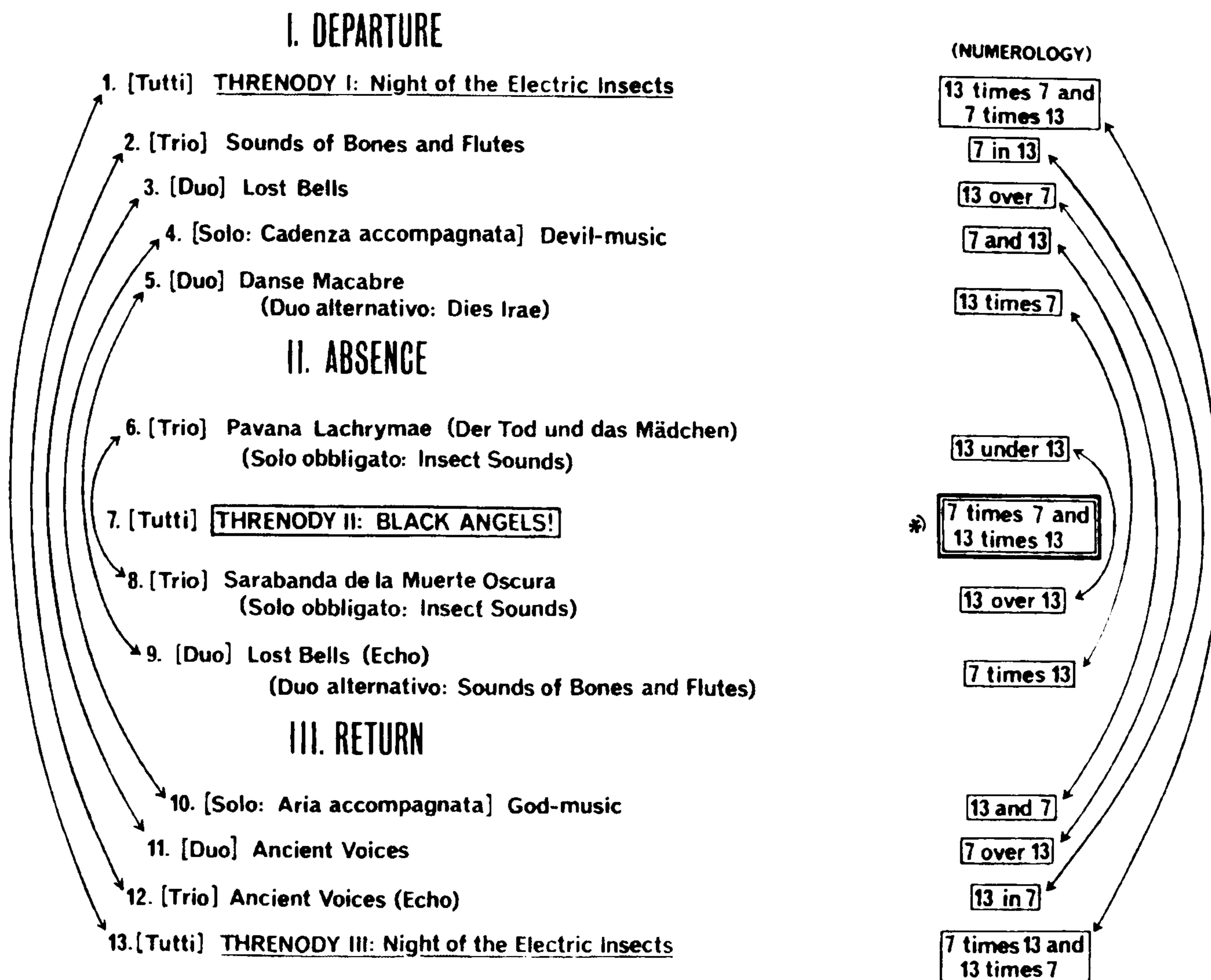
(Crumb, quoted in Yaple 1990: [n.p.])

The purpose here is not to speculate as to how the soul might travel from one stage to the next, nor to reflect on how this voyage is portrayed musically: rather, it is to consider the impact of that programme on the listening experience. This comment implies that the work can be considered as a whole, which in turn raises the issue of unity in so discontinuous and diverse a piece. At the front of the score, this conceptual 'voyage' is broken down further into thirteen smaller stages (see Ex. 7.3).

¹ The composer refers to the 1970s, although sadly this work is equally as topical in the 2000s.

Ex. 7.3:

PROGRAM



As Crumb's arrows indicate, the work is organised according to two patterns of numbers, implying a symmetrical form made up of paired movements. The arrows on the left, for example, connect sections involving the same number of players, indicating the pattern

4-3-2-1-2-3-4-3-2-1-2-3-4.

although in performance, most sections involve the entire quartet. The arrows on the right hand side illustrate an elaborate numerological scheme based on the 'magic' numbers 7 and 13, with their connotations of good and bad luck. Numerology

underlies compositional decisions at various structural levels, although its effect on the listening experience is limited.

As Crumb says, 'The numerological symbolism of *Black Angels*, while perhaps not immediately perceptible to the ear, is nonetheless quite faithfully reflected in the musical structure.' (Crumb, quoted in Yaple 1990: [n.p.]) In fact, the faithfulness with which it is reflected in the structure is questionable at all levels. Not shown on the programme is *Sarabanda de la Muerte Oscura (Echo)*, which follows *Threnody III*, meaning that there are actually fourteen sections in the form. However, that final, hidden segment fits in neatly with the numerology: $14 = 2 \times 7$. At a more local level, relationships within each of the sections are similarly inconsistent. The second and twelfth sections are paired in Ex. 7.3:

2. Sounds of Bones and Flutes 7 in 13

12. Ancient Voices (Echo) 13 in 7.

In *Ancient Voices (Echo)*, those numbers are manifest straightforwardly, as there are thirteen entries in seven bars. Arguably however, only the most 'numerologically primed' of listeners might appreciate this (see Ex. 7.4).

Ex. 7.4:

12. Ancient Voices (Echo) [Trio] 13 in 7

Grazioso, flessibile [$\text{♩} \approx \text{ca. } 60$] *sul E* (glissando sempre)

Entries:	1	2	3	4	5	6	7	8	9	10	11	12	13
Bars:	1		2		3		4		5		6		7

The lack of an articulated pulse and the proximity of events mean that neither bars nor distinctly separate entries can be perceived in the sounding result. For example, the activity in the first three bars might be perceived as a single melodic figure, rather than five separate events. This is further evidence of the importance of visual presentation in *Black Angels*. '7' and '13' are realised only in terms of the notated score, as opposed to the perceived structure.

In *Sounds of Bones and Flutes*, '7 in 13' is expressed quite differently. Seven semiquavers are contained in the middle of a recurrent thirteen-note motif.

Ex. 7.5:

Electric Violin I.
mp

Again, many listeners would not recognise the underlying implication of this. Since it is not part of an ongoing pattern, the number of notes is essentially insignificant, in that it does not offer any means of making meaningful comparisons between musical events. Such of course, is the nature of symbolism, as Crumb concedes in the quotation above.

In other movements, numerological relationships are realised in other diverse ways. Thus, should an individual hear the entire work listening out for the 'numbers', they could not perceive global symmetry as shown in the programme, due to this inconsistency. Another instance of this literal kind of note-counting occurred in Chapter 3, in an observations which brought similarly little to bear on the listening experience: the first sound in *Atmosphères* is heard as a single sonority, rather than as 59 separate pitches. To elaborate on the comparison between these two pieces,

interestingly, Crumb's numerical structure creates the opposite state of affairs to Ligeti's arches. In the earlier work, interlocking processes of 11 and 13 bars result in a global form which carefully manipulates perception, despite a note at the front of the score emphasising that barlines should be imperceptible. By contrast, the equivalent composer's note in *Black Angels* literally illustrates patterns of 7 and 13, which have no such effect. Thus, where Crumb makes explicit patterns which are not heard, Ligeti makes implicit those which are. What's in a number? Presently, not a great deal from the point of view of listener perception. Instead, in *Black Angels*, musical significance is brought about through relationships between styles.

Polarity: Good and Evil

According to the programme, the fourth and tenth formal segments, entitled *Devil-music* and *God-music* respectively, are diametrically opposed. Although each involves all four members of the quartet, both are marked 'solo': the former features the first violinist (whose part is marked 'Vox diaboli'), the latter, the 'cello (correspondingly, 'Vox Dei'). The implication therefore, is that these two segments are equal and opposite extremes. Importantly, the present purpose is not to argue that the 10th segment is divine, nor that the 4th is diabolical. Rather, it is to consider how the programmatic opposition might be manifest musically.

God-music

Of the two, *God-music* is perhaps the more striking. Occurring at the start of the third movement, 'Return', it is the first point at which the crystal glasses are used. First and foremost, this has implications for timbre. The 'purity' of the bowed-glass sound is

remarkable in most contexts, and its impact is enhanced here, set against extended string techniques (which often play on the boundaries between notes and noise) and unpitched percussion. Further, the beginnings and endings of notes are not as clearly defined as in other instruments, meaning that at a note-for-note level, listeners are denied the ability to map time. Fittingly for a section intended to evoke the divine, sounds grow seamlessly from nothing, and return to nothing.

A secondary effect of introducing this new sonority is manifest visually, almost as a theatrical gesture. *God-music* is preceded by a 13-second silence, and marked to be played 'with profound calm':

Ex. 7.6:

III. RETURN

10. God-music [Solo: Aria accompagnata].

Adagio (with profound calm) $\text{♩} = \text{ca. } 50$

13 and 7

The musical score for 'God-music' features a solo electric cello part and a string quartet. The cello part is marked 'Vox Dei' and 'pp molto cantabile'. The string quartet consists of Violin I (7 Crystal Glasses), Violin II (7 Crystal Glasses), Viola (6 Crystal Glasses), and Cello. The score includes performance instructions like 'col arco, legatiss.' and 'sempre sim.'

As the violinists and violist turn and bow their glasses, their movements are far less frenetic than previously, due to the slow tempo. Since Crumb specifies a down-bow for every note, the performers (other than the solo 'cellist) are unified in a peaceful, gradual, *single* motion. In comparison with the rest of the work, therefore, *God-music* presents a visual extreme as well as a programmatic one. Arguably, the enhancements which *Black Angels* brings to the string quartet are a crucial part of how it communicates, although leaving timbral and theatrical elements aside, the present concern is how musical materials present information.

The tranquil on-stage appearance of this segment is reflected in its similarly static musical content. The texture shown in Ex. 7.6 remains constant throughout: a high-register 'cello traces a melodic line beneath the 'glass' trio², the only variance being that at times one member of that accompanying group moves slightly out of phase. Melodically, there is a clearly-defined global shape, a single inverted arch: the tune descends to the D above middle C in the eighth bar of the twenty ('13 and 7'), and then ascends two octaves, bar-by-bar, to the final D². Tonally, this section is similarly as unified and immobile, as harmonic movement continually encircles the tonic triad, B major. In fact, at various points that triad merely alternates with other sonorities, as in Ex. 7.6. This restrained harmonic vocabulary brings into question the usefulness of an in-depth harmonic analysis, although the generic characteristics of this particular B-major tonality are worthy of note. Indeed, the global features of pitch organisation, rather than specific harmonic functions, contribute more to the significance of this music.

As shown below, the intervallic characteristics of the opening phrase are highly suggestive of Messiaen's modes of limited transposition (Ex. 7.7 is an annotated reduction of Ex. 7.6). This texture, an ongoing melody meandering within those modes, over slower-moving, repetitive modal chords, is found in a great deal of that composer's music of the 1940s.

² NB the glasses sound an octave higher than written.

Ex. 7.7:

10. God-music [Solo: Aria Accompagnata]

Violoncello

Crystal Glasses

Total Pitch Content

Enharmonic Pitch Content

Messiaen's Second Mode of Limited Transposition

Messiaen's Second Mode of Limited Transposition, 'truncated' version (see Street, 1976, 819).

Indeed, there are other points of connection between the outputs of these two composers. Moevs notes a number of connections between Crumb's *Music for a Summer Evening* (*Makrokosmos III*) (1974) and the Frenchman's *Le Reveil des Oiseaux* (1958) (Moevs, 1976: 296-7, 299, 301), with some disdain. Presently, the chamber-music setting of *God-music* seems to point to a specific referent, the *Louange à l'Éternité de Jésus* from the *Quatuor pour la fin du Temps* (1941) (compare Exx. 7.7&8).

Ex. 7.8:

V. Louange à l'Éternité de Jésus

Infiniment lent, extatique

Violoncello

Piano

Vc.

Pno.

p (majestueux, recueilli, très expressif)

A

Péd

Péd (etc.)

In both cases, simple, often triadic harmonies are stated repeatedly as the only accompaniment to strikingly similar solo 'cello melodies. There is an obvious reason why Crumb might want to listeners to make this connection. Perhaps more than any other work, the *Quatuor* is inextricably associated with the Second World War; famously, it was composed and first performed in the Prisoner of War camp at Görlitz³. Thus, there is a clear extra-musical link between *God-music* and the *Louange à l'Éternité de Jésus* ('Praise to the eternity of Jesus'), as both are hymns to the divine set in the context of works composed 'in tempore belli'.

Having identified this reference, the question of how useful this information is remains – how does it inform the listening experience? For qualified listeners, who recognise the significance of the reference, *God-music* has a particular association with war – this knowledge speaks for itself. However, other listeners may not be familiar with the Messiaen, or not so familiar as to recognise the connection. It is impossible to say how they might understand this significance, although at the very least, it is distinct within its immediate surroundings. As explained above, timbral, temporal and harmonic characteristics all suggest stability and order in relation to the other parts of *Black Angels*. Most importantly, this movement is highly contrasted with *Devil-music*.

Devil-music (and Danse Macabre)

In contrast to the high register 'cello shown above, *Devil-music* features a low-register first electric violin part, one clearly intended to evoke the longstanding extra-musical associations between virtuosity on that instrument and the Devil. Besides the famous diabolical mystique surrounding Paganini, there is a similar tale regarding Tartini.

³ However, parts of the *Quatuor* had actually been written earlier (see Hill & Simeone, 2005: 73, 103-107).

whose *Devil's Trill Sonata* was supposedly inspired by a dream in which 'in which the devil seized ... [his] ... violin and played a particularly difficult trill.' (Thompson and Roche, 2002: 1257). In response, the seventh formal segment (*Black Angels!*) consists essentially of a single, ongoing trill, marked 'trillo di diavolo'. However, the present concern is *Devil-music*, which, in opposition to the 'profound calm' of its partner segment, *God-music*, is marked 'In romantic-phantastic style!'.¹

The first violin part is extremely showy, involving repeated down-bowed, triple-stopped chords, simultaneous left-hand pizzicato and bowing behind the bridge, and various other techniques including increasing the bow pressure to the extent such that the pitch becomes pure noise. Ex. 7.9 shows the first system.

Ex. 7.9:

4. Devil-music [Solo: Cadenza accompagnata] 7 and 13

The score for Ex. 7.9 is titled "4. Devil-music [Solo: Cadenza accompagnata] 7 and 13". It features four staves: Electric Violin I, Electric Violin II, Electric Viola, and (Vc.) Tam-tam. The Electric Violin I part is marked "In romantic-phantastic style!" and "con bravura". It includes various performance techniques such as "pizz.", "arco", "sul pont.", "made w/d. (metal. non arpegg)", "pizz. arco", and "sul pont.". The Electric Violin II and Electric Viola parts are marked "Dies Irae" and "pedal tones!". The (Vc.) Tam-tam part includes instructions like "strike center with a very hard beater" and "bowed harmonic: Ca. bow on rim". The score is marked with dynamics like "ff", "mf", and "f", and includes performance instructions like "(accel.)", "(sul pont.)", and "(lasc. vibre)".

As shown, all of this activity is punctuated by ensemble interjections in which the second violin and viola play portions of the *Dies Irae* plainchant from the Roman Mass in pedal tones (another extended technique in which the bow exerts greater pressure than usual on the string, resulting in a timbre which is largely noise but in which pitch can be faintly discerned; it is marked 'ugly, obscene'), while the 'cellist strikes, and subsequently bows, the tam-tam. Overall, therefore, the collective visual effect is that the ensemble is in a state of disintegration, in contrast to the unified bowing of *God-Music*; and similarly, the overtone-rich noises stand as an opposite

extreme to the pure sound quality of the crystal glasses. Theatrically and timbrally, this section is frenetic, fragmentary, and indeed violent.

This section is marked 'Solo: Cadenza accompagnata', and just as the accompaniment undermines the label 'solo', its pitch organisation negates any sense of cadence. There is certainly no basis for listeners to expect harmonic resolution, since no tonal centre is projected. Instead, the musical surface is characterised by a recurrent intervallic cell, consisting of a perfect fifth and tritone. Some examples are marked in Ex. 7.10.

Ex. 7.10:

4. Devil-music [Solo: Cadenza accompagnata] 7 and 13

In romantic-phantastic style!
Vox Diaboli arco sul pont. (con bravura)

Electric Violin I. piz. arco sul pont. (accel.)

Electric Violin II. piz. arco sul pont. (accel.)

Electric Viola piz. arco sul pont. (accel.)

(Vc.) Tam-tam

"Dies Irae" = 60 ugly, obscene

shrike center with a very hard beater

bowed harmonic: C♯ bow on rim

with very hard beater

lay low aside

attacca subito

Perfect fifth: 7 semitones
Tritone: 6 semitones
Minor ninth: 13 semitones

This shape recurs in various guises throughout *Black Angels*, beyond the confines of *Devil-music*. As Izquierdo and Crumb point out, it fits the numerological scheme: the fifth encompasses 7 semitones, the tritone, 6; stacking the two on top of each other results in a minor ninth, a span of 13 semitones (Izquierdo and Crumb, 2006: [n.p.]). That knowledge does little to advance an understanding of how this music communicates, however, since as explained above, numerology is a rhetorical device rather than a generator of substantive musical relationships. Nonetheless, in many other works, this shape plays an important role. It recurs at various levels throughout Stravinsky's *Requiem Canticles* (notably in the *Dies Irae* setting); the A-E tonic-dominant axis of Debussy's *Jeux* is undermined by the presence of E² as an alternative secondary tonal area. Doubtless the prominence of this cell can be put down to the fact that its constituent elements – the perfect fifth and the tritone – are representative of tonal stability and instability respectively; this combination of intervals offers composers the chance to manipulate the balance between listeners' expectations for necessary continuation and their perceptions of satisfactory completion. In *Black Angels*, however, pitch organisation changes with each passing section, such that the redefinition of this cell is a mere surface effect, with no deeper harmonic or tonal significance. Instead, its value lies in its broader associative significance, what it points to outside of the piece.

The role played by this cell in *Devil-music* is to serve as a precursor to its appearance in the succeeding section, *Danse Macabre*. The same is true of the quotations from *Dies Irae*. Played in pedal tones as in Ex. 7.10, it is difficult to recognise the plainchant at its initial appearance, meaning that this quotation works against itself, as even qualified listeners are prevented from identifying what they are hearing. However, in the subsequent section the implications of both the intervallic

cell and the plainchant are revealed. Crumb's *Danse Macabre* presents the elements of Saint-Saëns' piece of the same name. Ex. 7.11 shows how this works in a typical passage of the Crumb (see below).

Ex. 7.11:

Crumb: *Black Angels*

5. Danse Macabre [Duo] 13 times 7

Grotesque, satirical (♩ = 240 sempre)

Knuckles on wood (or finger tip)

Duo Alternativo: "Dies Irae" (♩ = 240) pizz.

Dies Irae plainchant (from Roman Mass)

Di-ex i-rae, di-es il-la sol-vent, aë-clus in fi-vi-la

Translation of text
The day of wrath, that day shall dissolve the mortal world in ashes

Saint-Saëns:
Danse Macabre

17 bars after fig. A

fig. D

There is, of course, nothing inherently 'macabre' about the music in either of these dances, just as there is nothing inherently Devilish about a solo violin. However, by using this quasi-quotation to bring about an association specifically with the Saint-Saëns, Crumb hopes to play on its extra-musical connotations. For example, the use of the violist's 'knuckles on wood' is a reference to the sound of the xylophone, used in the earlier piece to represent dancing skeletons (indeed, wooden sounds can also be found in *Sounds of Bones and Flutes*). Further, as shown above, the (now clearly

audible) *Dies Irae* quotation is used again in a satirical manner. Scored for pizzicato strings and maracas, its percussive texture is as far removed from the foreboding sentiment in the text of the original plainchant as Saint-Saëns' setting of the tune as a waltz.

Perhaps Crumb fails in conjuring images of death in the minds of some listeners – that depends on their belief – but he succeeds in enabling qualified listeners to situate *Devil-music* and *Danse Macabre* in relation to a particular model. Similarly, *God-music* evokes specific associations with Messiaen. That these sections are programmatic extremes might seem to imply a stylistic opposition between the styles of the two French composers. Indeed, *God-music* is extremely tonally stable and unified in comparison with the fragmentary atonality of *Devil-music*; musical contrast is brought about in terms of broad, generic characteristics, rather than through the nature of the musical content. However, the meaningful relationship here is between extra-musical associations, rather than musical materials. In absolute terms, neither of these sections is any more divine or diabolical than the other. Rather, they represent order and disorder respectively in relation to the other sections of the form.

Stylistic Reference: Absence and Present

Another extra-musical theme running through *Black Angels* – indeed one which underlies the division of the piece into three parts – is 'absence' (Departure-Absence-Return). In the context of allusions to death and spiritual annihilation, there is an intended sense of tragedy associated with this concept, as indicated by the names of some of the formal segments. Bells and voices usually imply the presence of a human population, whereas Crumb's '*Lost Bells*' and '*Ancient Voices*' imply not only that

those things are *not* present, but that they are *no longer* present; that in earlier (perhaps more peaceful) times, they were. This sentimentality is heightened in the respective partner-sections, *Lost Bells (Echo)* and *Ancient Voices (Echo)*, the idea of an echo implying a further level of remove; that those nominal sounds are more-absent-still. There is a great deal of scope for nostalgia in *Black Angels*; and while it is essential to be wary of romanticising, it is equally important to ask how the piece *can* be considered to communicate the notion of absence.

In the same way that, through symbolic association, musical styles are used to communicate Godliness in relation to Devilishness, so they are used to express absence in opposition to presence. To say that something is 'absent' is to imply that it is not here, although importantly, the term might also be taken to refer to things which are not 'now'. Considered thus as temporal, or rather historical states, absence and presence correspond to the past and – as one might expect – the present. Accordingly, the piece juxtaposes styles ranging from ancient to (1960s-70s) modern. The ends of that spectrum are presented most clearly in the second movement, 'Absence', in which the 'renaissance' sections *Pavana Lachrymae* and *Sarabanda de la Muerte Oscura* are heard immediately before and after the modernistic *Threnody II: Black Angels!* The pavan is considered alongside *Threnody I: Night of the Electric Insects* below, however, since that opening section has more direct referential connotations.

Pavana Lachrymae

This formal segment is marked to be played (or perhaps heard) as if it were 'A fragile echo of ancient music'. By implication, therefore, Crumb would have it that this music is, in fact, doubly absent: 'ancient music' denotes one level of remove from the present, and the intimation that this is an 'echo' implies a second. The extra-musical

connotations, stylistic implications and visual presentation are carefully managed, and can be understood to bring about this 'fragile echo'. On stage, the *Pavana* 'looks' like renaissance music, as this is the first point at which instruments are held as though they were viols. Fittingly, the resultant viol-like timbre is far thinner and less pronounced – less acoustically 'present' – than that produced ordinarily by (amplified) modern string instruments. This demonstrates the link between the twentieth-century electric string quartet and its ancestor, the renaissance viol consort, in perhaps as immediate and effective a manner possible. However, Crumb's intention goes beyond merely pointing out the history of string ensembles. Given the stylistic implications and extra-musical connotations of the material (explained below), this is an allusion to a loss of innocence. By implication, present-day instruments themselves are fallen (*Black*) *Angels*.

'*Pavana Lachrymae*' is a peculiarly powerful title. It evokes connotations not only of a particular Renaissance dance form but also, more specifically, of a tradition associated with the sixteenth- and seventeenth-century English lutenist and composer John Dowland. As Holman and O'Dette explain, 'his most popular piece was the pavan *Lachrymae*. He turned it into the song *Flow my tears*, and it occurs in about 100 manuscripts and prints in many different solo and ensemble arrangements' (Holman and O'Dette: 2001, on-line, accessed 13th July 2008). This is not the place for discussing the life and times of either the song or the pavan, as a comprehensive knowledge of the corpus of works it has generated is not necessary to understand how it brings about significance in *Black Angels*. Nonetheless, it is worth briefly considering how certain aspects of its history play a part in pre-conditioning listeners to this twentieth-century quartet. The lyrics of the original song highlight the

astuteness of Crumb's choice of title. The extract below shows only the first and last verses:

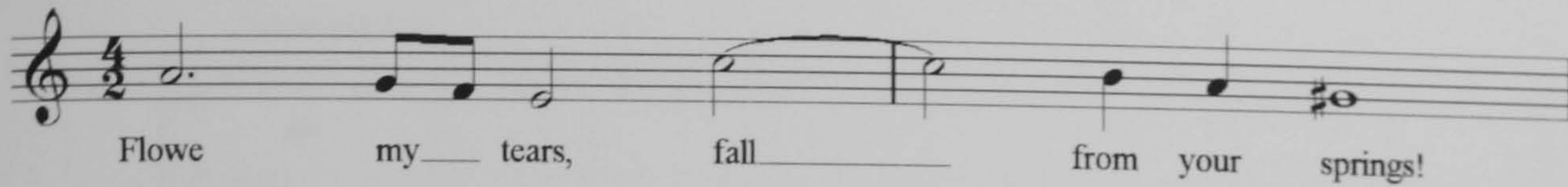
Flow my tears, fall from your springs!
 Exiled for ever, let me mourn.
 Where night's black bird her sad infamy sings,
 There let me live forlorn
 ...
 Hark you shadows that in darkness dwell,
 Learn to contemn light,
 Happy, happy they that in hell
 Feel not the world's despite.

(Dowland, 1600)

These references to the opposition between light and darkness, hell (interestingly, compared favourably with the world, rather than unfavourably with heaven), night, mourning and exile encompass nearly all of the extra-musical sentiments attached to *Black Angels*: black and white, good and evil, death, and absence. Importantly, however, only supremely qualified listeners – those who are both aware of the Dowland and familiar enough with this text to hold it in memory – might recognise those connections, since these words are not actually heard in the Crumb. In fact, the song's own 'sad infamy' stems largely from the use of the melody in instrumental arrangements. There is a long historical line of pieces which take the *Lachrimae* theme as source material, and even today that melody continues to be rearranged and quoted, appearing in ever more diverse contexts,⁴ ensuring and sustaining the ubiquity of the 'falling tear' motif (see Ex. 7. 12).

⁴ Indeed, the influence of that song is still felt in the Twenty first century, in ever more diverse ways. Most recently, the pop star Sting was inspired to record the song (Sting, voice: 2006, CD) after having heard a version by the tenor John Potter accompanied by jazz musician John Surman on bass clarinet, lutenist Stephen Stubbs, Baroque violinist Maya Homberger, and jazz musician and avant garde composer Barry Guy (Potter, tenor: 1999, CD).

Ex. 7.12:



Having appeared in print so many times under ‘*Lachrymae*’, this figure is virtually synonymous with the word. Thus, simply by using this title, Crumb evokes in his (appropriately qualified) listeners a specific expectation of hearing this melodic line. However, having aroused their anticipation, he denies its satisfaction. Instead of Dowland, the audience is presented with a quotation of the opening of the second movement of Schubert’s String Quartet in D minor, the ‘*Death and the Maiden*’ quartet (D810). The extra-musical associations of that piece resonate well with those of *Black Angels*, although the musical connotations of this passage are perhaps of greater interest. The relevant parts of the two pieces are shown below (see Ex. 7.13&14).

Ex. 7.13:

II. ABSENCE

Solo Obligato: Insect Sounds

Electric Violin I. *sul pont. sempre* (foca)

Electric Cello *ppp nervous, flusteringly*

Electric Violin II. (held like a Viol.) *ppp*

Electric Viola (held like a Viol.) *ppp*

6. Pavana Lachrymae [Trio]
(der Tod und das Mädchen)

13 under 13 Grave, solemn; like a consort of viols (a fragile echo of an ancient music) $\text{♩} = 30$ ($\text{♩} = 60$)

subito più lento ($\text{♩} = 50$)

ancora più lento ($\text{♩} = 40$)

pppp sempre *attacca subito*

Ex. 7.14:

Andante con moto

The musical score consists of four systems of staves for Violin I, Violin II, Viola, and Violoncello. The first system (measures 1-8) is marked *pp*. The second system (measures 9-16) starts at measure 10, marked *f*, then *decresc.*, and *p*. The third system (measures 17-24) starts at measure 20, marked *pp*, then *cresc.*, and *p*.

Needless to say, the original passage is adapted for Crumb's purposes. In order to accommodate the solo obbligato, it is scored for (electric) trio, and it also slows down and fades, such that by the end of the eleventh bar it has disappeared completely. (Indeed, at the back of the score there is an alternative version of this section in which the effect is heightened, as bar-by-bar the pitch is lowered too; the result is rather like a record slowing to a halt.) However, the exclusion of the third phrase and of the 'Tierce de Picardie' ending of the chorale are more substantial alterations. On account of those omissions, there is only one resolution to a major triad, and more importantly there is no modulation to the relative major. This all but eradicates major tonality, with its positive rhetorical connotations, although more significantly, due to the absence of a modulatory passage this chorale is denied its

tonal shape and temporal impulse. Should this passage seem deficient in terms of tonal interest, however, it can arouse listeners' curiosities in other ways.

Firstly, the openings of both these second movements have similar dynamic functions, marking points of stylistic contrast. This might come (literally) as no surprise in *Black Angels*, since listeners might infer a change of style with each formal segment. However, even in this stylistically volatile context, the introduction of a regular pulse and conventional tonal harmony is a significant change. Similarly, this material stands out as remarkably atypical of nineteenth-century style in Schubert's quartet: its regular four-bar phrases and repeated long-short-short rhythms are purposefully made to sound markedly distinct from their Romantic context. Like Crumb, the Austrian composer is making reference to a stylistic *other*; the Renaissance pavan.

Secondly, in addition to this general stylistic allusion, these bars serve as quotations of specific original sources in both pieces. Just as *Black Angels* quotes the *Death and the Maiden* quartet, so in its own turn the latter uses material taken from the beginning and the end of Schubert's 1817 setting of Matthias Claudius's poem, *Der Tod und Das Mädchen*. Thus, by hinting at Dowland specifically, and imitating Renaissance music more generally, Crumb quotes Schubert-quoting-himself-imitating-Renaissance music...clearly, the situation (process) is complex, offering a multi-levelled perspective on events. Ex. 7.15 sets out the network of connections brought about by *Pavana Lachrymae*, illustrating an implied 'echo' effect.

Ex. 7.15:

The diagram shows a musical score for the Crumb Quartet, consisting of three staves: Electric Cello (top), Electric Violin II (middle), and Electric Viola (bottom). The score is in a key with two flats and a common time signature. Above the staves, three musical excerpts are shown: 'Schubert Quartet', 'Schubert Lied', and 'Renaissance Pavan'. Arrows indicate that the Crumb Quartet's music is a 'doubly-absent' reference to these three sources. The 'Schubert Quartet' excerpt is in the same key and time signature as the Crumb Quartet. The 'Schubert Lied' excerpt is in a different key and time signature. The 'Renaissance Pavan' excerpt is in a different key and time signature. The Crumb Quartet's music is a complex, multi-layered reference to these three sources.

The diagram shows how this quotation might be understood as a doubly-absent 'fragile echo of ancient music'. At every stage in this multi-levelled reference, the passage in question is dependent for its identity on other, older music. This is a wonderfully poetic concept, since it implies notions of pieces contained within pieces; the intangibility of the present; that the past itself harks back to other, more distant pasts. However, cutting through those mists of time, the issue here is how all of this affects listeners to *Black Angels*. Essentially, this material offers significance from a number of perspectives since, as shown, it can be situated in relation to a number of pieces. Even at the immediate, theatrical level, there is a connection between Crumb's quartet and the Renaissance viol consort, and his careful choice of quotation opens up a number of intermediate levels of meaning for more highly qualified listeners.

An aspect of *Pavana Lachrymae* which has not been discussed above is the first violin part. In the score it is labelled, 'Solo Obligato: Insect Sounds', which heightens the connotations of the Baroque. Indeed, this obligato consists of ornament-like trill and turn figures (see Ex. 7.13 above). Rather than being presented as a decorative extension of the Schubert quotation, its chromaticism, extreme high register, and ejaculatory nature set it apart from the rest of the ensemble. The second part of the label is probably communicated more effectively than the first in the

listening experience, as at the most basic level, the high-pitched, frenetic sounding result is intended to mimic the sound of insects. This highlights its direct relationship with the first section of *Black Angels*, *Threnody I: Night of the Electric Insects*. Thus, at the same time as *Death and the Maiden* is used to allude to the 'absent' past, these 'insect sounds', hark back to 'the present'.

Threnody I: Night of the Electric Insects

Like '*Pavana Lachrymae*', '*Threnody I*' has powerful connotations. As well as referring directly to Penderecki's famous *Threnody – To the Victims of Hiroshima* (1960), this section has associations with other sounds and other music, and this is perhaps best explained taking the words of the title in reverse order. At a basic level, the opening section of *Black Angels* mimics the sound of a swarm of insects, and it takes only a small leap of the imagination to appreciate how that image might be evoked in listeners' minds (Ex. 7.16 shows the opening passage).

Ex. 7.16:

I. DEPARTURE

1. Threnody I: Night of the Electric Insects [Tutti] 13 times 7 and 7 times 13

Vibrant, intense! $\text{♩} = 60$
sempre sul ponticello e glissando

Electric Violin I. (sempre sim.) 9

Electric Violin II. (sempre sim.) 9

Electric Viola (sempre sim.)

Electric Cello (sempre sim.)

7 3 4 7

The silence preceding a concert performance is interrupted by this explosive sonority, and that initial contrast is indicative of the extreme nature of the material: it is frantically fast, alternately very loud and very quiet indeed, and scored in the highest register for each member of the ensemble. The insect-swarm-like quality lies in its internal characteristics and its behaviour through time, however. Take for example the way in which the bipolar changes of dynamic are emphasised. Any reader who has suffered the misfortune of a persistent in-ear gnat or, worse still, mosquito will appreciate the effect – and referential significance – of the bracketed *crescendi* in the violins!

Closer inspection shows that within the scope of their gestural contours, these four (a)melodic paths are designed to intersect each other as frequently and closely as possible, bringing about constant semi- and/or whole-tone friction between the two violins and between the viola and 'cello. This puts paid to any relationship between consonance and dissonance. The effect is similar to Ligeti's micropolyphony; aurally, the frenetic lines fuse together to form a single mass of sound, the separate parts of which are imperceptible, as are the individual insects of a swarm. Indeed, just as in the double-canon of *Atmosphères* (see Exx. 3.5a&b), the more slowly-moving background cluster dictates the larger-scale shape. As a whole, *Threnody I* alternates between passages in which the pitch content is highly changeable, as in Ex. 7.16, and others in which it is static. Ex. 7.17 traces the larger-scale relationships between those static passages, illustrating the movement of the background cluster.

Ex. 7.17:

The musical score for Ex. 7.17 consists of five systems of staves. Each system typically includes staves for E. Vln I and II, E. Vla and Vc, and a 'Changeable Pitch content' staff. The notation includes notes, rests, and dynamic markings. The 'Changeable Pitch content' staff shows a series of notes with a wavy line above them, indicating pitch fluctuations. The score also includes specific motifs for Vln I and Vln II, and Vc motifs. The overall structure shows a progression of musical ideas across the systems, with a final system ending on a specific pitch.

* Except where indicated

Overall, there is a downwards registral shift towards the middle of the third system, followed by a brief rise and then a further descent. There seems to be some significance attached to the tritone A-D[#](/E^b). The section ends on those two pitches;

the latter one recurs as the upper limit of the tessitura at various points; and as the cluster reaches its lowest range the former is at its centre. However, since both perpetually conflict with chromatic neighbour-notes and neither is sustained for longer than seven seconds at a time, it is difficult to perceive any kind of structurally significant relationship between them. Thus there is an absence of any deeper sense of order. Just as in *Kontakte*, this intensifies the sense of the present (as opposed to the absent).

Presence of yet another kind – acoustic – is intensified by the amplification of the instruments, and this provides a simple answer to the question of how the proposed insects are ‘electric’. The resulting timbres ‘are intended to produce a highly surrealistic effect’ (The Official George Crumb Home Page, Compositions: [n.d.], accessed 13 July 2008), perhaps demonstrated more clearly in other parts of *Black Angels*, by the pedal tones of *Devil-music*, for example. As Arnold explains, such ugly sounds are typical of ‘War music and the Composer during the Vietnam Era’ (Arnold, 1991): ‘To deal with the Vietnam War in music, composers intensified the horror in its portrayal of war. Composers used electronic machine gun fire, sounds of actual bombs exploding, indeterminate sections with singers shouting and screaming, and other realistic sounds.’ (ibid: 322). Where Crumb speaks of the timbrally surreal, Arnold writes of the sonically real; essentially both are referring to the extension of the timbral palette beyond concert-hall norms. In the light of this, and given the composer’s demonstrable propensity for mimicry, perhaps the constant tremolandi of *Threnody I* are representative of Vietnam-War helicopter turbines. Perhaps this truly is a metaphoric swarm of *Electric Insects*.

Absolutely not. It may be that some listeners might choose to believe that assertion or, conversely, that some ‘believers’ choose to listen to it. Indeed, the fact

that the sounds of the music themselves led (me) to it shows that it is possible to project that association onto the piece. While on the one hand, *Black Angels* is clearly not intended as ‘absolute’ music, on the other it is contrary to meaningful discussion to read too much – or rather, to read too specifically – into everything that the work might conceivably connote.

Harley illustrates this point well, citing the differences of opinion among various earlier scholars as to the significance of a passage of Bartók (Harley, 1995: 331-3). In the same sixteen bars of piano music, one author recognises birdsong, another hears portrayals of three different species of owl, two types of frog, and a cricket, and another still, an ‘entire evening concert of frogs’ (ibid: 331). Harley herself is unsure which of the three motifs in Ex. 7.18 to interpret as ‘an image of a croaking frog’ (ibid). Admittedly, it is a tough question. All three seem to have equally as little to do with a frog’s ‘ribbet’ as one another (unless the amphibian in question has a peculiar musical talent), less still the ‘image’ of that sound, whatever it might look like.

Ex. 7.18:

Motifs in Bartók’s *Out of Doors* Suite, No. 4 *Night Music*
(Harley’s numbering)

The image shows two staves of musical notation. The top staff is labeled 'Piano' and shows Bar 9. It contains motifs 1, 2, 3a, and 3b. Motif 1 is a quarter note with a sharp sign. Motif 2 is a quarter note with a sharp sign and an 8va-1 marking. Motif 3a is a quarter note with a sharp sign and a flat sign. Motif 3b is a quarter note with a flat sign. Dynamics markings include 'poco sf' and 'sf'. The bottom staff is labeled 'Pno.' and shows Bar 13. It contains motifs 4, 5, 6, and 10. Motif 4 is a quarter note with a sharp sign. Motif 5 is a quarter note with a sharp sign and a flat sign. Motif 6 is a quarter note with a sharp sign. Motif 10 is a quarter note with a sharp sign and a flat sign. A tempo marking '(♩ = 66)' is present. Dynamics markings include 'poco sf' and 'sf'.

(Example taken from Harley, 1995: 332)

It is of course unfair to quote Harley out of context like this. As she acknowledges, 'the ambiguity of Bartók's nature images results from the high degree of stylisation of natural sound transformed into music' (ibid: 333). In fact, her article is an attempt to demarcate a particular context in which such materials as those above might be understood thus: its subtitle is '*Bartók's Nature Music Idiom*', her preferred term for what those disagreeing, older authors called his 'night music'.

Presently the focus is on *Black Angels*; this is not the place for a full explanation of the Hungarian composer's 'night music' idiom. Importantly however, certain generic features of *Threnody I: Night of the Electric Insects* conform to that style, albeit in a subversive fashion. The name of this particular brand of Bartók derives from the title of the fourth movement of his *Out of Doors* piano suite (1926), ('*Night Music*'), although the idiom also appears in many of his other works (notably the string quartets). Besides the presence of birdsong transcriptions (especially of the nightingale), and other symbolic motifs (as above), Harley cites its characteristics as 'quiet, tiny, delicate textures...set against a background of "stylised noise" suggested by a semitone cluster' (ibid: 331). Given that 'Crumb acknowledges his debt to ... Bartók' (Borroff: 1986: 552, see also Steinitz, 1978: 845; Moevs, 1976: 294-6), it is clear that although the texture in *Night of the Electric Insects* is far from delicate, the use of that title is an invitation to listeners to situate this section relation to this Bartókian 'nocturnal' style. Indeed, just as in *Pavana Lachrymae*, the material in this opening section – a robust, tempestuous chromatic cluster – subverts the expectations aroused in qualified listeners.

It remains to discuss the associations evoked by the first word of the title. A threnody is 'a poem, or its musical setting, expressing a strong feeling of grief for the dead; the term has much the same meaning as "lament"' (Boyd, 2001: 433).

Arguably, however, the word has stronger connotations of Penderecki than of that definition for most listeners to twentieth-century music. The Polish composer's synonymy with this type of piece stands as testament to the associative power of titles. Indeed, the *Threnody – to the Victims of Hiroshima* was only so-named 'following the comments of a conductor who felt the original title – a simple description of the work's duration – would not attract sufficient interest' (Lee, 1975: 585). Certainly, that reference to nuclear war lends his work an unforgettably intense emotional atmosphere. In accordance with the sheer scale of the destruction caused by the bomb, the opening sonorities of the Penderecki are more suggestive of pained screams of anguish than a wailing lament (see Ex. 7.19).

Ex. 7.19:

The image displays two musical score excerpts for the opening of Penderecki's *Threnody – to the Victims of Hiroshima*. The top score is for the string section, and the bottom score is for the woodwind section. Both scores are marked with *mf* (mezzo-forte) dynamics.

String Section Score:

- 24 Violini:** Divided into four groups: 1-6, 7-12, 13-18, and 19-24.
- 10 Viole:** Divided into two groups: 1-5 and 6-10.
- 10 Violoncelli:** Divided into two groups: 1-5 and 6-10.
- 8 Contrabbassi:** Divided into two groups: 1-4 and 5-8.

The string section score shows a complex, layered texture with many notes and rests. A dotted line indicates a specific melodic path across the staves. The first 15 seconds and the final 11 seconds are marked at the bottom.

Woodwind Section Score:

- 24 Vn (Veni):** Divided into four groups: 1-6, 7-12, 13-18, and 19-24.
- 10 VI (Violini):** Divided into two groups: 1-5 and 6-10.
- 10 Vc (Violoncelli):** Divided into two groups: 1-5 and 6-10.
- 8 Cb (Contrabbassi):** Divided into two groups: 1-4 and 5-8.

The woodwind section score shows a similar complex texture. The first 4, 6, and 13 seconds are marked at the bottom.

The connections between this passage and the opening of *Black Angels* (see Ex. 7.16 above) are easy to see: both works start with loud, high-register chromatic clusters, with an emphasis on timbre over pitch: 'stylised noise'. Although this is not an exact quotation, the title invites listeners to situate this material in direct, positive relation to the earlier, more famous *Threnody*. In fact, Crumb's output as a whole has a great deal in common with that of Penderecki. For the American, with his penchant for 'knockout sonorities', the textural music of the Pole holds obvious attractions; similarly, unconventional notation characterises both their outputs; finally, of particular relevance here, there is a strong Bartókian influence on the music of both composers.

Overall, *Threnody I: Night of the Electric Insects* communicates in a similar way to *Pavana Lachrymae*, with referential implications on a number of levels. Most simply, the sounds in this section mimic the behaviour of insects, although they also have more subtle, stylistic implications relating to Bartók and Penderecki. Thus, a range of potential significances is offered to variously qualified listeners. In investigating the connotations of each of the words of the title, discussion has led away from musical aspects and towards extra-musical ones, however; some of the above is extremely far removed from the experience of listening to *Threnody I*.

By making particular titular allusions, Crumb hopes to evoke certain of the extra-musical connotations shared by his own piece and others to which it refers. Specifically, the term 'threnody' is intimately associated with war and death; 'night' and 'insects' with blackness and gothic, macabre imagery; and 'electric' might be construed as alluding to a potentially dangerous force. Those notions are not actually implied by the sounds themselves: and, importantly, they do not influence listeners' perceptions of relationships between particular notes on the page. Indeed, they can be

inferred from the title alone, without the need for a string quartet 'to prove it'. This begs the question of the role they play in how this music communicates.

Presence and Absence

The starting point for these deconstructions of *Pavana Lachrymae* and *Threnody I* was the idea that they represent the extremes of an implied spectrum of styles ranging from the ancient to the modern, corresponding to programmatic notions of absence and presence respectively. The relationship between the three *Threnodies* and the *Pavana* (with its counterpart, *Sarabanda de la Muerte Oscura*) is clearly intended to have implications. Although there are no arrows joining them together at the front of the score, the inclusion of 'Solo Obbligato: Insect Sounds' in the Renaissance sections makes some sort of connection explicit. However, besides this surface link, perhaps the only other feature they have in common is their shared extra-musical connotation of morbidity. In fact, since the *Pavana Lachrymae* and the *Threnodies* are both laments for the dead, according to their definitions, the contrast between them is heightened – the anguished screams of *Threnody I* are (literally) a far cry from the falling melodic wail of *Pavana Lachrymae*.

Arguably, just as for *Devil-* and *God-music*, the key difference between the modernist and viol-consort sections is that the latter involve tonal harmony; and as explained below, it was typical of Crumb to set such quotations in the context of atonality. As an illustration of the situation process at work, Steinitz reports having felt a sense of comfort on hearing such passages as *Pavana Lachrymae* in the 1970s, which Griffiths, twenty years later, did not:

Richard Steinitz has remarked that: 'The direct quotations from Bach, Schubert or Chopin, heard through Crumb's strange and unworldly soundscape, acquire an amazing aura of distance both cultural and temporal. Surrealist museum exhibits, their mummified beauty seems utterly remote, like a childhood memory of warm, homely security.' It worked. But it worked only so long as tonal and atonal were strictly separate categories, implying a similarly strict separation between ancient and modern. Once composers began re-establishing tonality, and working again in traditional genres ... such quotations as Crumb's lost the shock, the inadmissibility, on which their sentimental effect depended.

(Griffiths, 1995: 162 quoting Steinitz, 1975: 11)

Undoubtedly, in comparison with the high modernist (and thus staunchly anti-tonal) music composed on both sides of the Atlantic during the 1950s and 1960s, for many listeners, the easy-to-appreciate accessibility of tonal harmony must have had connotations of an ancient order; of an absent, bygone age. (Indeed, this effect is enhanced by the extreme quiet of those parts of the form, particularly after the equally extreme loudness of the opening). It might be argued that by including tonal music, Crumb bridged a post-war 'communication gap' between composers and the general public, offering his 1970s audience a chance to reflect on that supposed Golden era of tonality, when they knew what to expect in music, and how to respond emotionally.⁵ As explained above, part of the agenda of *Black Angels* is to provide listeners with such opportunities for sentimental reflection. However, Griffiths contends that by the 1990s, the adoption of tonally-centred (as opposed to tonal) pitch organisation by many composers had somewhat weakened this 'shock of the old'.

Nowadays, almost forty years after the première of *Black Angels*, it remains the case that there is very little drama attached to the use of tonally-centred pitch organisation. Further, the texturalism of the 1960s can be approached from a historical perspective. Schubert and Penderecki both belong to the past, and neither reference is any more shocking than the other. However, to twenty first-century listeners there

⁵ Paradoxically, the 'shock' and 'inadmissibility' associated with this mid-twentieth-century return to tonality might be said to mirror reactions to the break away from it, 60 to 70 years earlier.

remains an extreme and obvious contrast between the *Pavana Lachrymae* and *Threnody I*. Setting aside their musico-political and historical implications for the moment, and considering them as musical material, the principal difference concerns predictability. In *Threnody I*, listeners can only be certain of extreme and unexpected dynamic change, whereas in the Schubert quotation, they can expect resolution every four bars. Thus, in the act of perception, it might be argued that where the reference to Penderecki intensifies the present, directing the attention to the 'now!', *Pavana Lachrymae* points to harmonic events at the ends of each phrase: it is perpetually 'between nows' – forever absent. That is of course, a rather romantic reading of the notion of a chord progression, although it offers a further explanation of how these materials to symbolise presence and absence.

Blocking the Network: Formal Structure

Black Angels is fundamentally concerned with contrast, as its title suggests. Using the programme, Crumb asserts extra-musical oppositions between particular sections of the work, which can be recognised in a number of ways. Paradoxically, those very same assertions which serve to divide the piece also provide a basis for formal unity, for his stage-by-stage 'voyage of the soul'. In addition to the programme, numerology provides an alternative framework for coherence, and this illustrates a further paradox. There are various, diverse ways of considering the work as a single, unified whole. Ex. 7.20 shows the distinctive features of the 14 sections in words. Different sections of the work are clearly intended to perform different functions, and the blocks of the diagram are grouped accordingly.

I. DEPARTURE

II. ABSENCE

III. RETURN

Threnody 1: Night of the Electric Insects
Frenetic cluster material

Sounds of Bones and Flutes
Arch contour
Col legno battuto: strings struck with wood of bow
'Katoko' whispers

Lost Bells
Arch contour
Bowed Gong
Harmonics

Devil-Music
'Romantic-phantastic' violin solo
Recurrent 7-13 cell
Struck gong
'Dies Irae' pedal tones

Danse Macabre
Recurrent 7-13 cell
Knuckles on wood
'Dies Irae' pizzicato, whistled
Saint-Saëns references

Pavana Lachrymae
Tonal harmony
Viols
Solo 'Insect sounds'
Schubert quotation

Threnody 2: Black Angels!
Frenetic cluster material
Recurrent 7-13 cell
Struck Gong
'trillo di diavolo'

Sarabanda de la Muerte Oscura
Modal harmony
Viols
Solo 'Insect sounds'

Lost Bells (Echo)
Bowed Gong
Arch contour
Harmonics

'Wooden' Sounds

God-Music
Cello solo
Octatonic harmony
Glass Armonica

Ancient Voices
Bottle-neck technique
glissandi
Martellato (glass rod tremolo)

Ancient Voices (Echo)
Bottle-neck technique
glissandi

Threnody 3: Night of the Electric Insects
Frenetic cluster material

Sarabanda de la Muerte Oscura (Echo)
Strings struck with thimbles as Sarabanda fingered
'Cello harmonics

'Glass' sounds

The emphasis on 'wooden' sounds (*col legno*, 'knuckles on wood') in the first movement and 'glass' sounds (bowed crystal glasses, the use of glass rods) in the third corresponds with programmatic associations of good and evil. The respective opacity and transparency of wood and glass equate to black and white, which are analogous in turn to the underlying extra-musical meanings of *Departure* (fall from grace) and *Return* (redemption). Along similar lines, it might also be considered significant that the shouting of numbers is confined to the second movement; in some sense the middle movement of the piece, *Absence*, is notionally 'more-foreign' than the outer two, containing languages from various countries.

The *Threnodies* are structural pillars at the beginning, centre, and end of the form. The outer two are coupled with sections in which strings are struck; and as explained above, *Threnody II: Black Angels* is framed by highly contrasting 'viol' movements. Accordingly, the two *Lost Bells* movements act as transitions to inner groupings: *Devil-Music* and *Danse Macabre* stand as counterparts to *God-Music* and the two *Ancient Voices* sections. Notionally, *Sarabanda del Muerte Oscura (Echo)* serves as a kind of synthesis, seeming to address all of the issues raised by the piece. The strings of the viola and violins are gently and repeatedly struck by two thimble-capped fingers of the right hand, which moves from the bridge to the middle of the string. As marked in the score, the result is that 'two distinct musical events ... emerge: a faint echo of the Sarabanda, and the high pitched "insect-music" glissandos.' (see Ex. 7.21).

Ex. 7.21:

♩ = 60 Sarabanda de la muerte oscura (echo)

pp a very rapid tremolo with two thumb-capped fingers (gliss. sempre)

pp delicatissimo, ghostly, phantasmal

at bridge middle of string

fingering

pp a very rapid tremolo with two thumb-capped fingers (gliss. sempre)

pp delicatissimo, ghostly, phantasmal

at bridge middle of string

fingering

pp a very rapid tremolo with two thumb-capped fingers (gliss. sempre)

pp delicatissimo, ghostly, phantasmal

at bridge middle of string

fingering

Electric Cello

♩ = 40

ppppp (no details) as from afar

ppppp (sempre sim.)

ppppp

This extended technique brings together notions of ancient and modern styles, with their connotations of absence (the echo of a sarabande) and presence (high pitched 'insect sounds') and of good and evil. Thus, this hidden fourteenth section (which ensures a '7-related' numerological scheme overall), addresses most if not all of the issues raised by the work. However, any sense of completion that it brings about is strictly extra-musical, since the oppositions which it 'resolves' are all programmatic. In spite of various formal schemes, the question of how, if at all, surface-level musical events contribute to larger-scale unity remains open.

One particular smaller shape is worthy of note, however. Throughout this conceptual arch form, melodic arcs appear in many guises, as shown below.

Ex. 7.22:

2. Sounds of Bones and Flutes

sempre col legno tratto (sul G)

E. Vln. I

mp

Detailed description: A single staff of music for E. Vln. I in 3/4 time. The music consists of a series of eighth notes, some with accents, and some with a 'col legno' effect. The dynamic is marked *mp*.

3. Lost Bells

E. Vln. II

E. Vc. (Vln II)

(Vc)

(sim.)

3" 3" 3" 3" 3" 3" 7"

pp > *pp* > *pp* > *pp* > *pp* > *pp* > *pp* >

E. Vc.

poco f

pp sub.

Detailed description: Two staves of music. The left staff is for E. Vln. II and the right for E. Vc. The left staff has several triplets of eighth notes, each marked with a double quote (") and a dynamic of *pp*. The right staff has a melodic line with a dynamic of *poco f* and a *pp sub.* section.

6. Pavana Lachrymae

E. Vln. II

pp Bow behind left hand!
(sempre senza vibr.)

Detailed description: A single staff of music for E. Vln. II in 3/4 time. The music consists of a series of eighth notes. The dynamic is marked *pp* and the instruction is 'Bow behind left hand! (sempre senza vibr.)'.

8. Sarabanda de la Muerte Oscura

E. Vln. I

pp Bow behind left hand!
(sempre senza vibr.)

Detailed description: A single staff of music for E. Vln. I in 3/4 time. The music consists of a series of eighth notes with a triplet and a sextuplet. The dynamic is marked *pp* and the instruction is 'Bow behind left hand! (sempre senza vibr.)'.

9. Lost Bells (Echo)

pizz. (play like guitar harmonics;
tones should ring like tiny
bells)

(*poco accel.* - - - *rit.* - - -)

E. Vln. II

mp sempre

E. Vc.

ppp (6th part.) harmonics

Detailed description: Two staves of music. The left staff is for E. Vln. II and the right for E. Vc. The left staff has a series of eighth notes with a dynamic of *mp* and the instruction 'pizz. (play like guitar harmonics; tones should ring like tiny bells)'. The right staff has a series of eighth notes with a dynamic of *ppp* and the instruction '(6th part.) harmonics'. There is a tempo change indicated as '(poco accel. - - - rit. - - -)'.

10. God-music

E. Vc.

pp < *mp*
molto cantabile

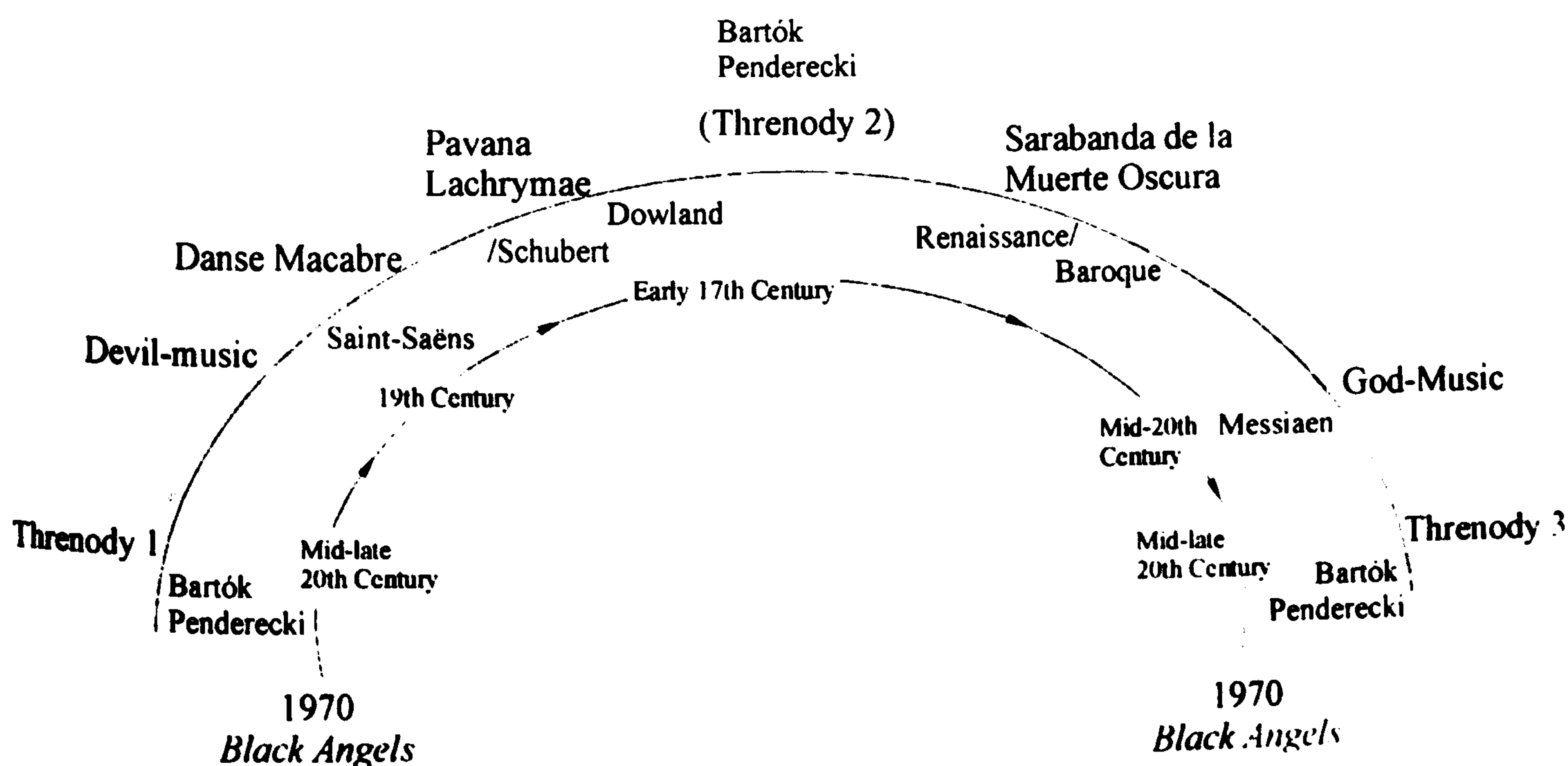
Detailed description: A single staff of music for E. Vc. in 5/16 time. The music consists of a series of eighth notes with a triplet. The dynamic is marked *pp* and *mp*, and the instruction is '*molto cantabile*'.

The second motif shown in *Lost Bells* is closely related to the one in *Sound of Bones and Flutes*. In the other sections – those referring to earlier Western styles – it is manifest far more subtly, although clearly this recurrent shape implies some sort of inter-sectional relationship, however tenuous. Importantly, due to continually

changing types of pitch organisation and the lack of a regular pulse, these patterns do not have higher-level implications. Unlike *Jeux*, in which the initial material can be heard to grow into a fully-fledged wave figure spanning over an octave, these motifs do not form part of an ongoing process; these smaller arches do not support the large-scale formal design.

Of the various ways *Black Angels* coheres as a whole, none seem to concern inherent relationships between the musical materials. Even in the case of the recurrent arc-contour, the notes on the page have very little to do with formal coherence. Inasmuch as there are significant musical connections, however loose, between the blocks of this formal network, they are at the level of style. The implications of section names offer listeners the opportunity to create for themselves a network of expectations as to how to situate the sounds they hear. By referring to particular styles and works, Crumb invites listeners to appreciate the connection between those referents and extra-musical associations. Accordingly, in so far as there is an overall musical pattern, it lies in the relationship between the distribution of styles and the history of music. Thus, there is an arch starting in the present (of 1970) with Penderecki, moving through Saint-Saëns to Dowland, and then back again.

Ex. 7.23:



It is possible to identify trends in the behaviour of material from one block to the next (the harmony is increasingly less chromatic towards the middle of the form, for example), although it is very hard to appreciate the perceptual significance of such threads of continuity. Since the style changes with each passing section, there is no musical constant against which to measure change. Rather, as explained above, this pattern is used to represent a programmatic constant, the ongoing theme of presence and absence. In the present analysis, therefore, *Black Angels* communicates through extra-musical networks of association.

Networks of Association

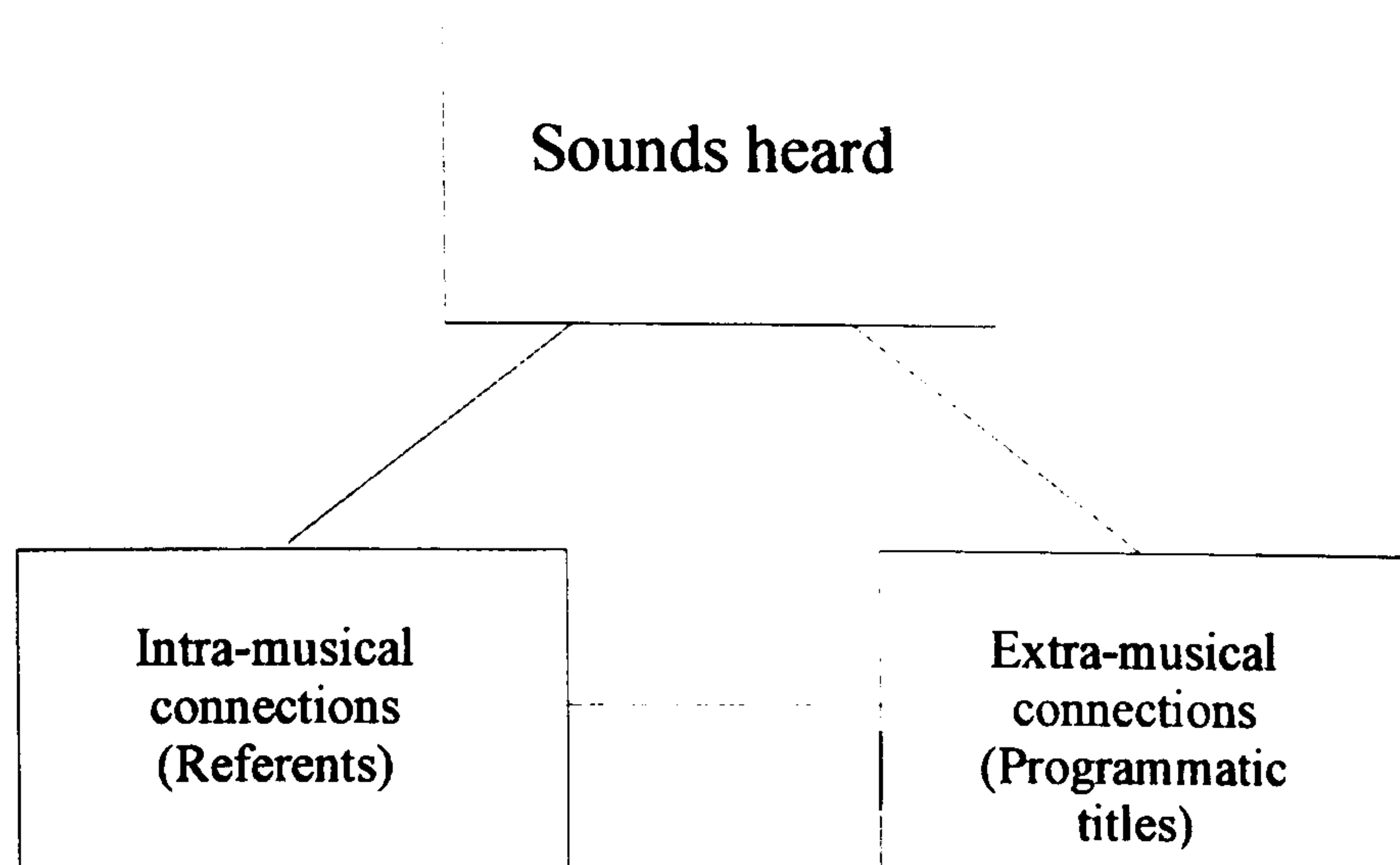
From one point of view, the communication process in *Black Angels* is simple, bordering on the simplistic. The programme might be considered as a kind of 'instruction manual', spelling out how listeners might understand the work, one section at a time. The clearest example by far is *Sounds of Bones and Flutes*. The *flautando* first violin literally sounds like a flute (indeed that marking has a greater effect than normal due to its amplification), and it is accompanied by percussive pizzicati and tongue clicks, imitating bones being struck. Other sections of the work are not as straightforward, however.

In *Lost Bells* and *Lost Bells (Echo)*, listeners are presented with a bowed gong and sustained, fading-in string harmonics. Notably, despite the various percussion instruments used to augment the ensemble, there is, in keeping with the title, a marked absence of bells. Perhaps those pure harmonics, the metallic sound of the gong, and the absence of timbral attack combine to create some assonance with a decaying-

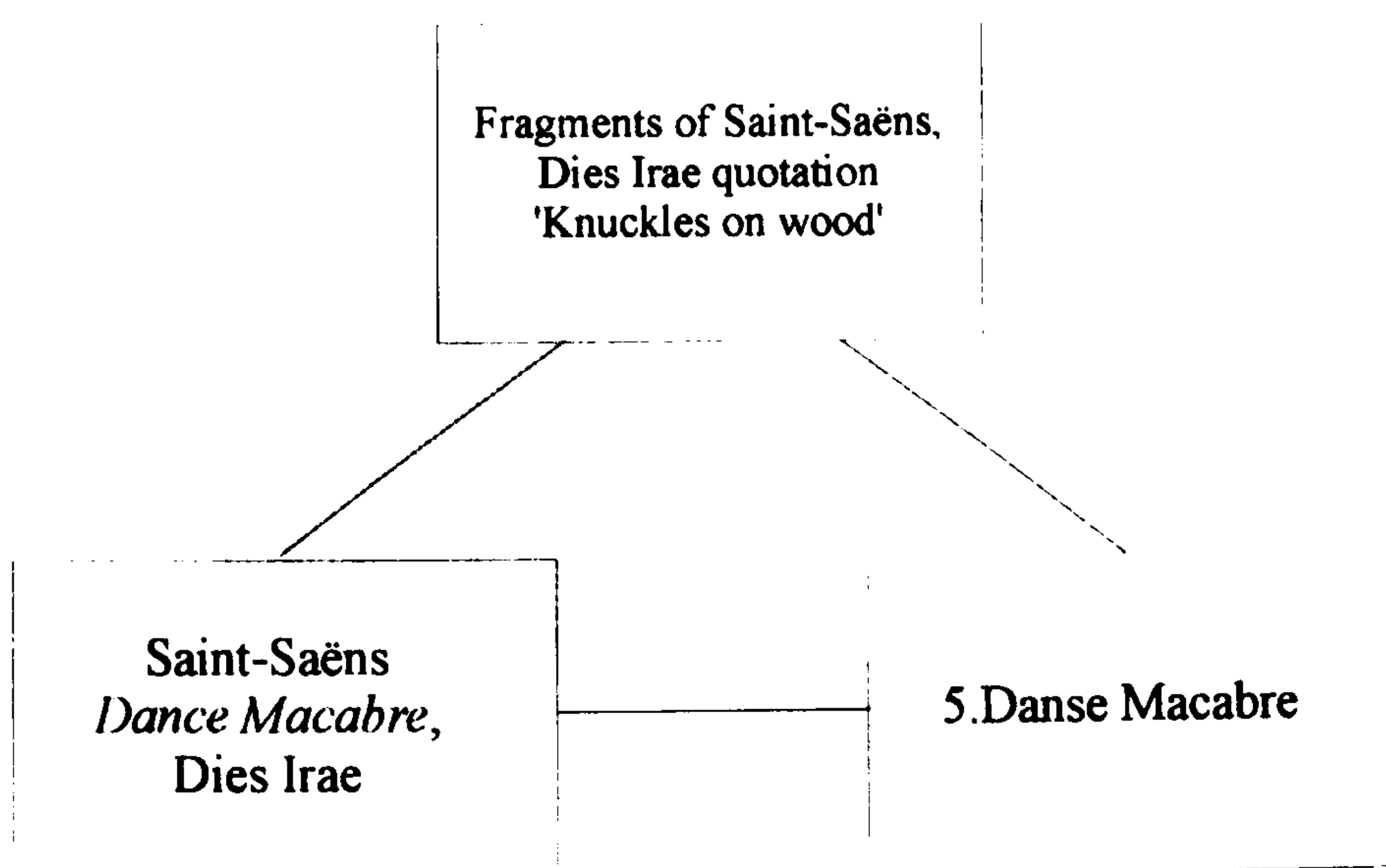
chime sonority. With the possible exception of pizzicato harmonics in the *Echo* section, however, there is no obvious attempt to reproduce bell-like timbres.

More extreme examples are to be found in *Ancient Voices* and its *Echo*. Although the performers are frequently required to vocalise earlier in the work, there is not so much as a whisper here, nor any instrumental mimicry. Therefore, the communication process comes full-circle. Whereas at the outset, listeners are asked to hear *Sounds of Bones and Flutes* as imitated by an electric string quartet, here in the third movement, they are simply told to imagine the sounds of voices; the instruction-manual programme bears no obvious relation to the sounds themselves. Clearly, the communication process is not as simple as it might initially appear.

Crumb presents his audience with many different kinds of information: theatrical, numerological, programmatic and, of course, musical. This diversity is reflected in the similarly broad potential for different readings. As for any piece, although all of the listeners (to a single performance) witness exactly the same events, no two people's understanding of the work can be the same. Effectively, the subtlety of *Black Angels* lies precisely in its capacity for contrasted receptions, which is played upon with great skill. Indeed, an element of misunderstanding is inbuilt, as surely even the most poly-lingual of listeners would not be able to count from one to seven in French, German, Hungarian, Japanese, Russian *and* Swahili! The potential for slippage is played upon in far more subtle ways, however. The diagram below expresses the basic network of associations implied by each section of the work. Within each formal segment the contents of the boxes remain constant, although they change from one to the next (see Ex. 7.24).

Ex. 7.24:

It is easy to understand how this network functions in most sections of the form. Typically, there are positive links between the three boxes on the diagram. For example, the quasi-quotations of the Saint-Saëns in the fifth section bring about positive connections between the boxes on the diagram; all three elements relate directly to the notion of a *Danse Macabre*.

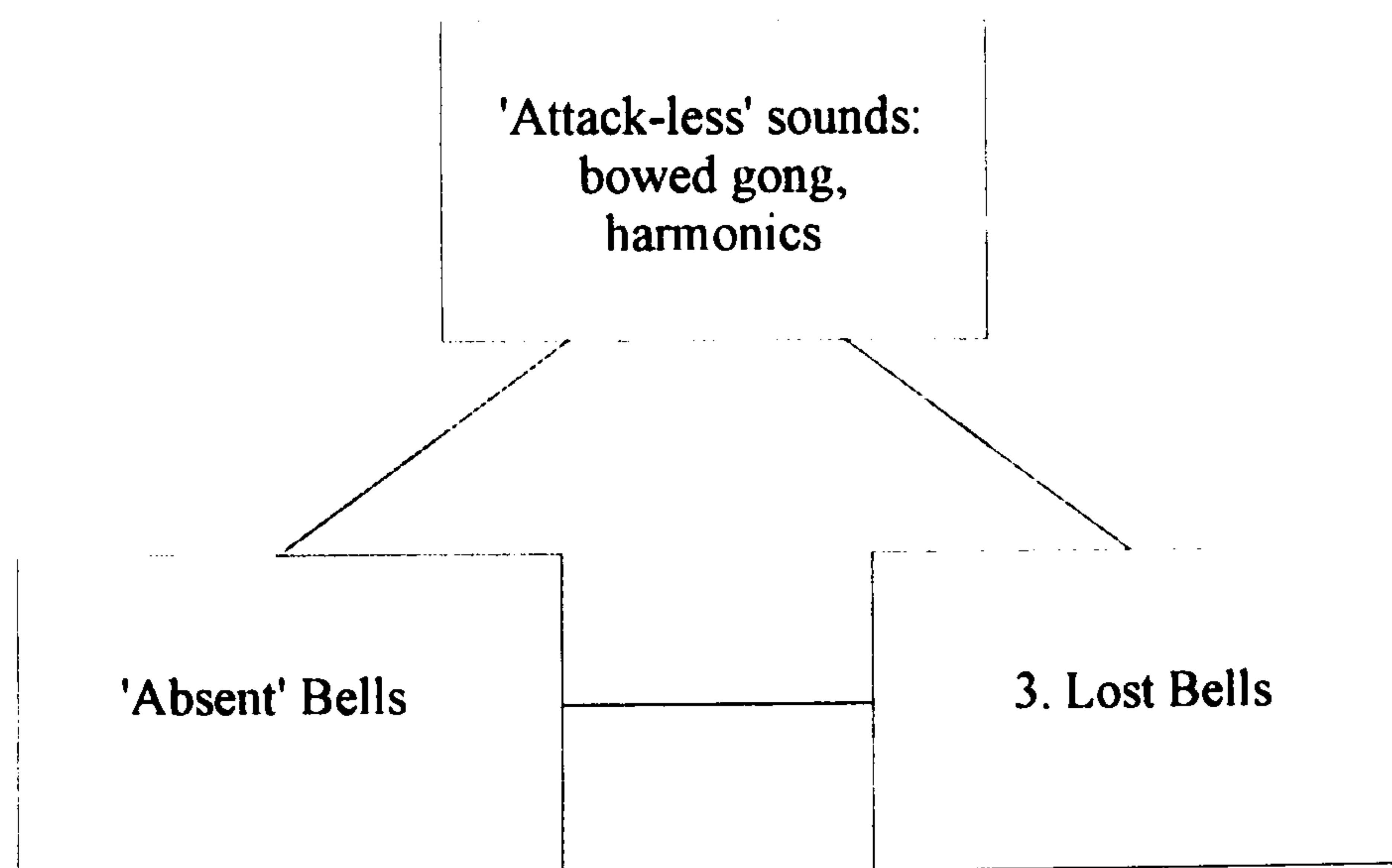
Ex. 7.25:

Inevitably, the idea of 'negative' relationships between the boxes is more intriguing than the straightforward example quoted above. Imagine, for example, if the names given to *God-music* and *Devil-music* were swapped. The purity of the

crystal-glass timbre, and the instantly 'sweet' consonance of the Messiaenic harmony might well intensify the connotations of the Devil further (after all, he always gets the best tunes). Arguably, the associative network would break down in the hypothetical alternative *God-music*, however. Rather than bring about an ironic extra-musical meaning, arguably the disorderly solo violin movement would fail to connote. Indeed, at no point is that kind of binary juxtaposition used. Instead, the notion of an opposition between titles and sounds heard is handled more subtly.

As explained above, *Lost Bells* and *Ancient Voices* are remarkable in that their eponymous sonorities are not mimicked by the ensemble. However, using those descriptors, Crumb circumvents the mismatch between the sounds and the title.

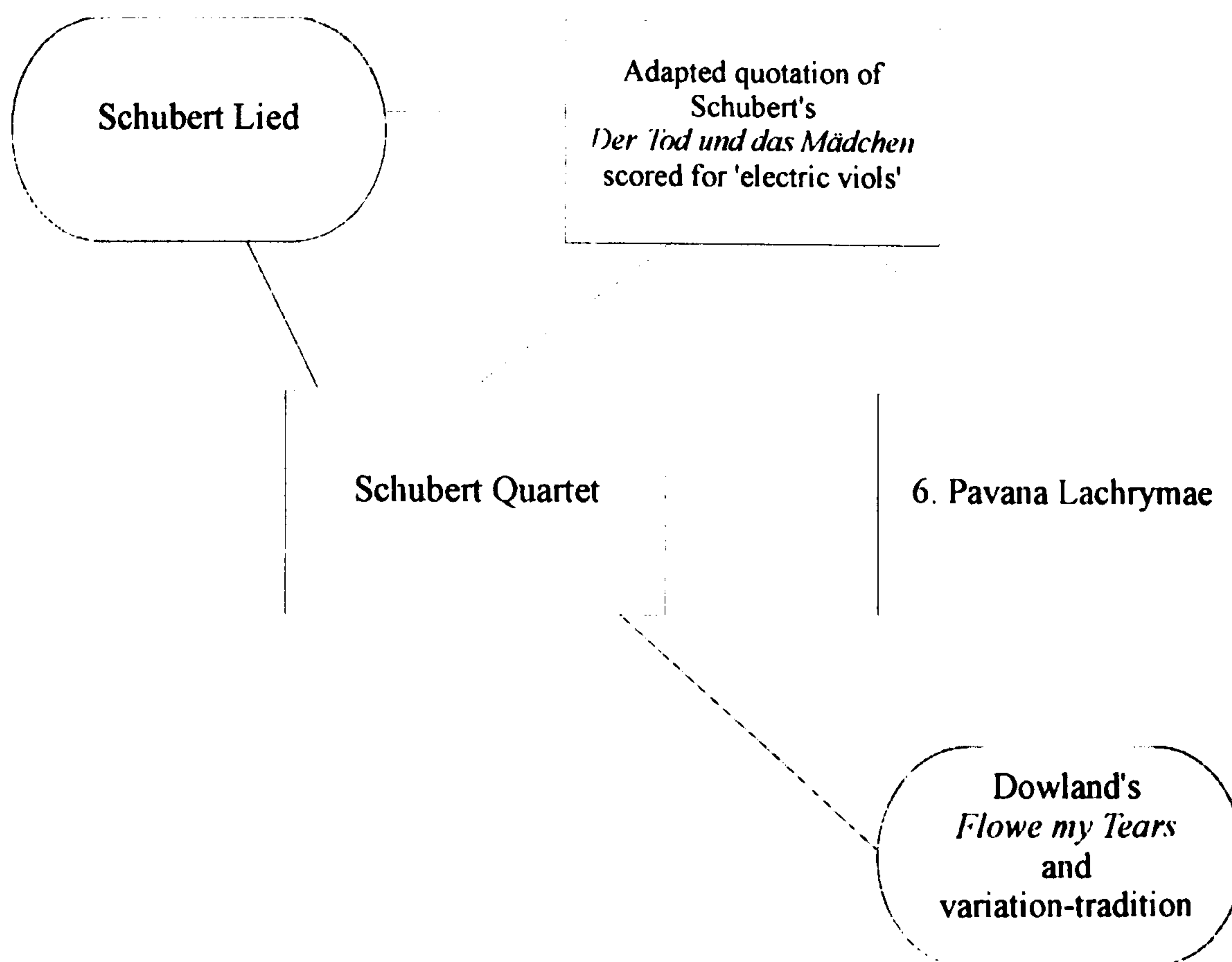
Ex. 7.26:



Undoubtedly the most sophisticated reference in *Black Angels* is *Pavana Lachrymae*. Its deliberate avoidance of quoting Dowland, the most obvious referent, implies a titular opposition, which opens various levels of intra-musical significance. On account of the 'echo effect', it can be situated in a number of ways by variously qualified listeners. Some might recognise the Schubert quotation with its extra-musical implication of *Death and the Maiden*; others might simply experience its

Renaissance style (perhaps thoroughly unqualified listeners might merely recognise tonal harmony). Importantly, by subverting the expectation of the *Flowe my Tears* motif, Crumb alters (qualified) listeners' perceptions of the sounds they hear. Thus, his programmatic titles potentially offer a range of significance, rather than simply instructing listeners to grasp 'appropriate' fixed meanings.

Ex. 7.27:



All of the section names connote acoustic events, meaning that some sort of connection between the extra-musical connotations and the sounds heard is always clearly implied. Importantly, those titles differ in their degree of specificity. Some refer to particular timbres, as in *Sounds of Bones and Flutes*; in others particular works or forms are specified, as in the *Threnodies* or the *Sarabanda*; and at other times still, simple descriptive labels are used, as in *God-* and *Devil-music*. On account of this, there is scope for variously qualified listeners to situate the various parts of the piece within their own musical geographies. It is not necessary to have a full

knowledge of the intra-musical implications of the work in order to appreciate its extra-musical meaning(s).

A cynical view of *Black Angels* might be that, were it not for the programme, this music would be insignificant; that any meaning which can be perceived is *read into* it. There is seemingly no attempt on Crumb's part to integrate his *Thirteen Images from the Dark Land* musically at any deep level; each of the 14 sections of the form stands independently of the others; and, a sceptic might say, this makes for a weak structure. However, to hold such a view would be to misunderstand the meaning of the work – to miss the (reference) point(s) – entirely. In keeping with the explosive network of information it offers (with which the chapter started (Ex. 7.1)), it is more appropriate to say that a great deal comes *out* of the work. There are demonstrably subtle stylistic associations at play, as well as a layer of theatrical meaning; *Black Angels* is a multimedia piece. The meanings communicated by this quartet lie in the connections that it offers, and that it enables listeners to make, between it and intra-musical, as well as extra-musical, elements. Thus, it plays upon potential interactions with external things, rather than relying on them for significance: its reference points outwards. Chapter 8 discusses Berio's *Voci* as an example of stylistic fusion, the integration of two styles within one piece. Thus, at some level it forms an opposition – albeit not a black and white one – with *Black Angels*.

Chapter 8

Reference Points Inwards: Blurring Berio's *Voci*

Voci [Voices] (*Folk Songs II*) for solo viola and two groups of instruments invites listeners to ponder how voices are manifest in a work with no vocalists. Actually, its origins lie in vocal music. Berio transcribed the songs in question from field recordings of Sicilian folksingers. He then scored for them viola and composed a highly inventive orchestral accompaniment, and that process in turn implies two further manifestations of musical voices. Firstly, it brings about a textural opposition between accompaniment and soloist, which is inevitably linked to a second pairing, the stylistic interplay between Berio's voice as a composer and those of the recorded singers as performers. In the listening experience, these divisions are not nearly as clear-cut. As a stylistic fusion, an essential aspect – indeed, a primary function – of *Voci* is to blur the distinction between folk- and art-music. Thus, it plays upon listeners' perceptions; by implication, the relationship between those two styles is different at the end of the piece than at the start. Prior to considering how that transformation might occur, it is important to understand the relevant differences between Berio's voice and the source materials as discrete, individual factors. Interestingly, a resistance to clear-cut definition is inherent to both.

Berio's Voci and (Folk Songs II)

As well as his pioneering vocal music, a distinguishing feature of Berio's compositional voice was that it often spoke through the music of others. 'The middle movement of [his]... *Sinfonia* for vocal octet and orchestra (1968-9)', stands as an icon of musical quotation which, as Griffiths says, 'achieves a complex irony, since

not only is it a wash of quotations, but that wash is contained within what is itself a quotation...' (Griffiths, 1995: 165). Needless to say, this composer, a crucial part of whose identity was the use of music from elsewhere, was acutely aware of the potential implications of musical reference. This makes the present work particularly interesting within his output, since conceptually it represents looking inwards rather than outwards. Although Berio's roots lie in mainland Italy rather than Sicily, to some extent *Voci* is an exploration of his voice as an Italian composer, an acknowledgement of his national musical heritage.

This was not the first time he had taken folk music as source material. The subtitle, (*Folk Songs II*), invokes *Folksongs* (1963/4), a set of eleven arrangements of songs from Armenia, Azerbaijan, France, Italy, Sicily, Sardinia and the United States for soprano and ensemble. The earlier work also brings the boundary between folk- and art-music into question, as two of the songs were actually written by Berio himself and another two by John Jacob Niles, an American folksong scholar and singer. King explains that 'the others are genuine enough' (King, 1995: 5), although to listeners there is no clear distinction between those which are traditional and those which were composed. Indeed, arguably the art-music influence of Berio is most clearly apparent in *Motettu de Tristura*, a traditional Sardinian song, sung in free-time against repeating mobiles and a microtonal, 'out-of-tune' viola drone. Berio's fondness for the instrument is further demonstrated in the famous opening viola duet, although there are no substantial links with *Voci*.

In fact, *Folk Songs II* seems to have been conceived quite differently to its predecessor, indeed on a different scale. The absence of a vocalist strips the songs of their texts, such that they are recognisable only as melodies to the majority of listeners (who are not aware of the implied textual meanings). Further, instead of separate, self-

contained 'movements', the source materials are presented within a continuous half-hour span, suggesting a far more integrated sense of wholeness and thus an overall form. If the arrangements in *Folksongs* 'invariably analyze and comment on their models' (Stenzl, 2001: [n.p.]), arguably *Voci* stands in the same relation to the folksong arrangement as a tradition unto itself. It goes beyond merely presenting the melodies as objects in a succession of new contexts, as it realises the musical implications of those objects, their contexts, and indeed of their succession. The composer's attitude is very down-to-earth, however.

"I'm not an ethnomusicologist", Berio confesses, "just a pragmatic egoist: so I tend to be interested only in those folk techniques and means of expression that I can in one way or another assimilate without a stylistic break, and that allow me to take a few steps forward in the search for a unity underlying musical worlds that are apparently alien to one another"

(quoted in Stenzl, 2001: [n. p.])

There are certain surface characteristics of *Voci* which are common both to Berio's compositional style and to Sicilian folk music: microtonal ornaments, heightened timbral manipulation, drones and heterophonic textures frequently provide some overlap between the two. As the composer says, unity is also brought about at a deeper, underlying level here, as styles are more comprehensively integrated. In fact, that fusion process starts at the pre-compositional stage, due to his transcription technique.

The Paradoxes of Transcription: (a) Blurring (of) Tradition

Sicilian folk singing is a rich and ancient tradition, as is reflected by the variety among the 14 folk songs used in *Voci*, listed below in the order they appear in the score.

A la Sciacchitana
Ninna Nanna di Carini
Cialoma quando s'issa vela
Balletto di Ciaramedde
Tunazione de li Catitari
Abbagnata
Tubbiana
A la Marsalisa
Canto di la Voro dei Pescatore di Corello
Abbagnata
Ninna Nanna
Ladata I
Ladata II
Nota di Monte Erice

The origins of some of the songs lie in everyday Sicilian life: 'abbanniatine' (*Abbagnatas*) are cries of street vendors (Stenzl, 2001: [n.p.]); there are many different *Ninna Nanne* (Italian for lullabies). Others, such as *Nota di Monte Erice*, refer to particular areas of the island (Monte Erice is a mountain on the North East of Sicily). Clearly, the extra-musical associations of the songs form a fascinating tapestry of Sicilian culture, and doubtless Berio was aware of this in choosing them. Presently, however, the focus is on the musical implications of how he uses them.

Berio's avenue to this music is transcription. His ideal is to employ three contrasting types of transcription in such a way that they begin to resemble and mutually vindicate each other. The first consists of an identification with the original; the second takes the original as a springboard for experimentation; the third overwhelms and virtually defaces the original.

(Stenzl, 2001: [n.p.])

As it is described above, this technique implies three separate categories of material, each at a different level of resemblance to the original songs; the melodies are presented in the score as more- or less-blurred versions of those sung on the recordings. This implies the composing-, or rather, transcribing-in of stylistic distance, as the composer creates control over the extent to which his materials are stylised and thus over the strength of his own influence. Without reference to pre-compositional workings and sketches it is difficult to assess the direct impact this

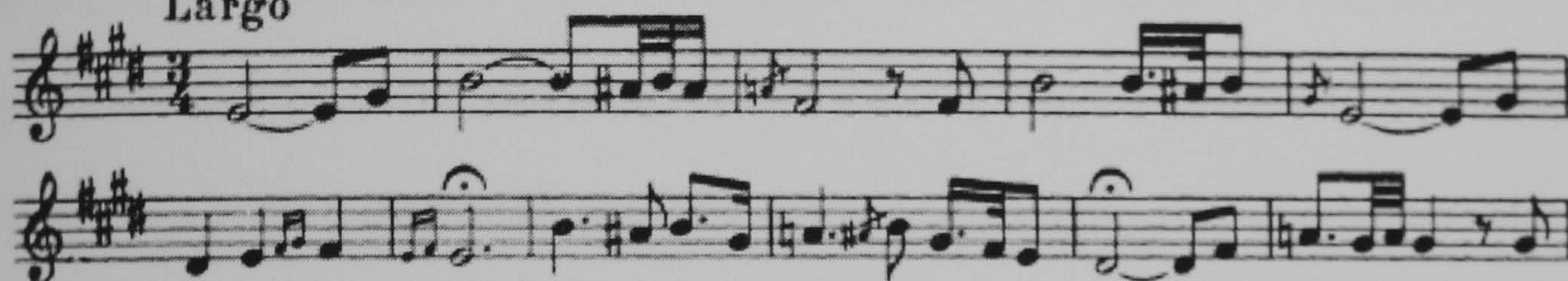
process has on the listening experience. However, the following examples illustrate some of its potential implications.

Exx. 8.1&2 are notated versions of the beginning of 'Ladata I' as quoted in William D. Gettel's 1944 article for the *Musical Quarterly* (Gettel, 1944: 366) and the same passage as found in *Voci*.

Ex. 8.1:

Ladata

Largo



Ex. 8.2:

(LADATA I)
(♩ = 60 ca.)

Viola

sempre f e teso

Vla.

The image shows two staves of musical notation for 'Ladata I'. The top staff is in bass clef with a key signature of one sharp (F#) and a 3/4 time signature. The tempo marking '(♩ = 60 ca.)' is placed above the first few notes. The bottom staff is also in bass clef with the same key signature and time signature. The music consists of a sequence of notes and rests, with some notes beamed together and others separated by rests. The notation is more complex and less clearly defined than in Ex. 8.1.

Although they present an almost identical sequence of melodic events, the two examples are notated quite differently, and the presence of the transcriber is clearly stronger in Ex. 8.1. Effectively, the key signature, time signature, and pause marks (implying phrasing) impose a rigid framework on the melody, along with corresponding constraints on its realisation in (a hypothetical) performance.

By contrast, in Ex. 8.2 neither the octave nor the passage of time is as clearly segmented and ordered. Centricity on E is undermined by the presence of an F# drone, and the rhythmic notation and local-level articulation combine to prevent any sense of

a regular, hierarchical pulse. Supposing that this reflects the faithfulness of Berio's transcription to the field recording, this heightened 'authenticity' points up a paradox. The precision implied by Gettel's regimentation of the melody can only result in an approximation of Ladata as sung by Sicilian folksingers¹. Conversely, although Berio's version is tightly based on an authentic performance, the violist is free to inflect the melody; the sounding result is 'loose' and unregimented.

There are very few passages of measured time in the viola part of *Voci*, and this in turn implies a further opposition between musical voices. As transcriber, Berio imposes limits (albeit far fewer than Gettel's) on the folksongs, whereas the performer invests them with a degree of freedom. Broadly speaking, then, in accord with the Sicilian folk singing tradition, in which individual singers bring their own blur to Sicilian folk songs, the way in which the soloist's voice blurs Berio's transcriptions is a crucial part of *Voci*. There are more specific implications as to what this transcription technique brings to bear on the listening experience, however.

In most of the folk songs², the melodic texture is constant, implying that each one is heard at a single, consistent level of remove from the recordings. However the two 'halves' of *A la Sciacchitána*, the first folk song to appear in the score, clearly belong to different categories of transcription. The sounding result is very different from one half to the next, although broadly speaking they both follow the same contour, coming to rest on or around F, C and A^b at the end of each line. (The final F[#] (G^b) is left unresolved at the end of each verse, although that dissonance gives way to the fundamental after the end of the second.) Since verses are not marked in the score, the melody is shown below firstly as it appears in print (system-for-system), and secondly separated into lines and verses (see Exx. 8.3a&3b).

¹ The notation which appears in Gettel's article is not accredited, hence it is referred to as 'Gettel's'.

² Henceforth, 'folk songs' and 'songs' refer to Berio's transcriptions as they appear in the score, except where indicated.

Ex. 8.3a:

Viola **B** ♩ = 56 ca.

Vla.

Vla. **C**

Vla. *gliss.*

Vla. **D**

Vla. **E**

Vla. **F**

Vla. **G**

Ex. 8.3b:

Verse 1

Verse 2

Verse 1

Verse 2

Verse 1

Verse 2

Verse 1

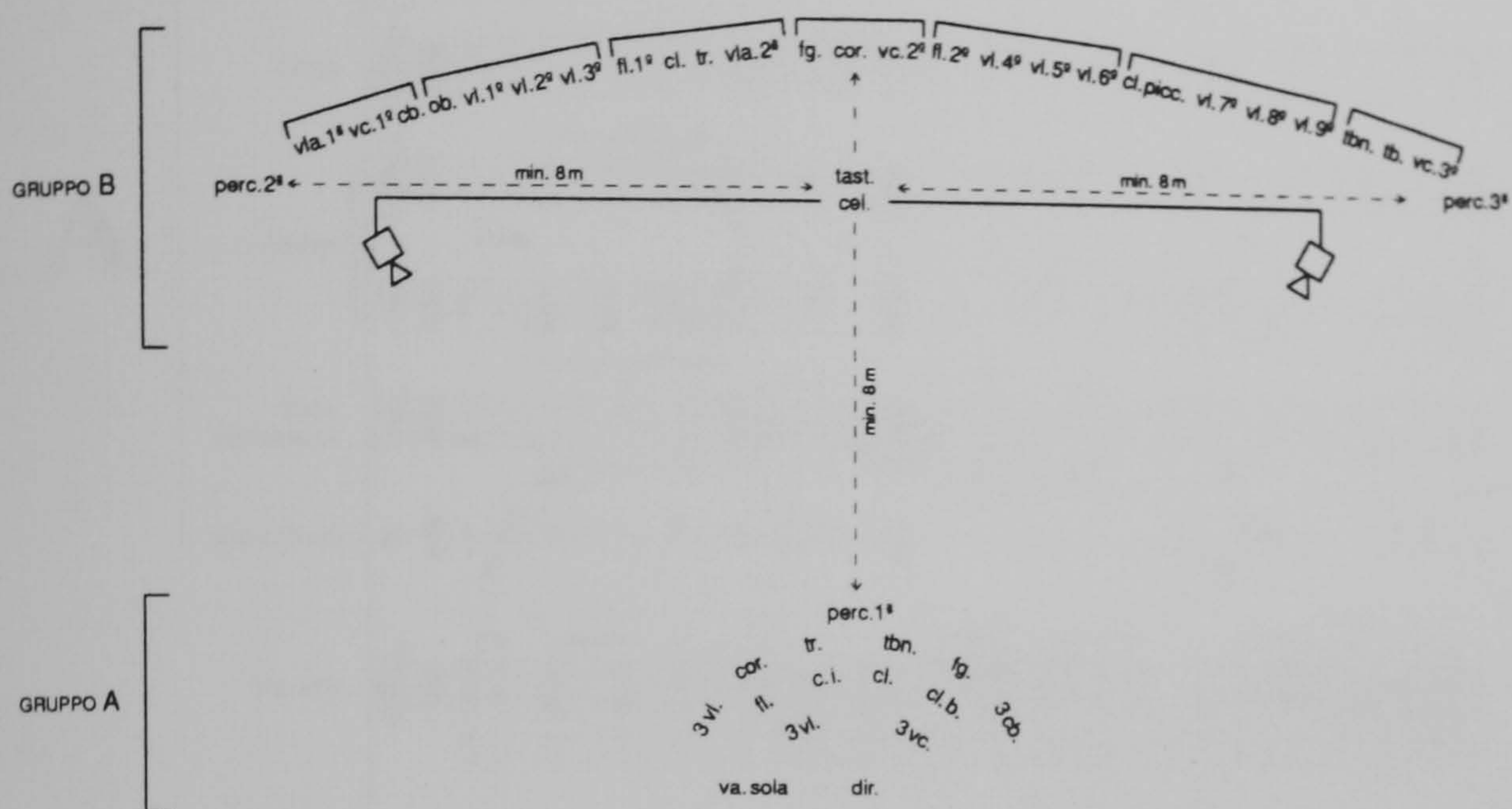
Verse 2

The first verse clearly belongs to the first type of transcription, its microtones suggesting as precise as possible a notation of the original recording. Notably, this implies a blur within the octave, as the 12 semitones of the chromatic scale merge into a less clearly articulated continuum. Thus, although it represents a more distant level of resemblance to the field recordings, the second verse is a 'clarification' of the first, as the same melodic contour is made to conform to the Aeolian mode on F. Paradoxically, therefore, as the folk songs resemble the raw materials less and less precisely, their pitch content actually becomes more and more clearly discernible. All of the melodies in the score have the same sort of harmonic implication, repeatedly tracing different paths between static, mode-defining structural pitches. Importantly, therefore, as the examples demonstrate, the transcription process imposes modality on the recorded folk songs, rather than the other way around. Thus, stylistic fusion is inherent even at the pre-compositional stage, since the songs are adapted even before they are placed in an art-music context. In fact, their literal 'placement' is very carefully considered.

Sounds in space: stylistic (dif)fusion?

The stage positions of his ensembles were an important part of Berio's compositional voice. In *Voci*, as in earlier works such as *Epifanie* and *Sinfonia*, the layout is cast as a kind of 'echo chamber' (Osmond-Smith, 2001: 355), in this case providing an acoustic space into which, by implication, the musical gestures of the soloist might be projected, shown in Ex 8.4.

Ex. 8.4:



The stage set-up is used to bring about various effects. A particularly clear example occurs during the first of the two *Abbagnatas*, as shown in Ex. 8.5; this illustrates the effect, alongside a reduction of the score at that point (figure W).

Ex. 8.5:

A

B

W

Snare Drum f p

Oboe

Strings pizz. 5

Bass instruments 5

Snare Drum f p

Va. sola *rall.*

Snare Drum f p

Strings pizz. 5

Bass instruments pp 5

GRUPPO B

GRUPPO A

perc. 2^a

min. 8 m

tast. cel.

min. 8 m

perc. 3^a

3 vi. cor. tr. tb. vc. 3^a

3 vi. fl. c.i. cl. fg. d. b. 3 vc. 3 cb.

va. sola dir.

pizz. 5 f

pizz. 5 f

pizz. 5 f

viola 1^a vc. 1^a cb. ob. vl. 1^a vl. 2^a vl. 3^a fl. 1^a cl. tr. vla. 2^a fg. cor. vc. 2^a fl. 2^a vl. 4^a vl. 5^a vl. 6^a cl. picc. vl. 7^a vl. 8^a vl. 9^a tbn. tb. vc. 3^a

Snare drum rolls are diffused rapidly around the performance space (on successive beats and half-beats), as if deflected from one percussionist to the next. In addition, the pizzicato chords played by the strings in groups A and B produce an echo – as they move from the front to the back of the stage, they are dispersed over a wider area, slowing down and fading away as they become more distant.

The performance space is manipulated to spectacular effect throughout, lending the work an added source of interest. This has a direct impact on listeners' perceptions: materials are made to emerge or become more distant, or gradually to fill the performance space. Much as this aspect is fundamental to the listening experience, however, these are surface effects, concerning the presentation of material rather than its substance. Thus, spatial diffusion does not contribute to stylistic fusion since it does not articulate large-scale temporal relationships; it does not have an impact on the overall process of integration.

Integral Unity from Stylistic Opposition

Rather than considering how this piece is an integration of folk and art music, a more fruitful approach to contemplating issues of large-scale synthesis is to assert that this integration of folk and art music forms a piece. From a simplistic viewpoint, it is difficult to imagine what else *Voci* could be, although such a statement gives rise to deeper implications of wholeness and unity. Berio's work is a single half-hour of music, rather than a succession of separate folk song settings. The source materials are played in a particular order, and there are interludes joining each one to the next. Thus, there is an implication that those short, static, self-contained folk songs somehow contribute to a longer, dynamic, ongoing formal shape. To assert that there

is formal unity in *Voci* – that it is a single piece – is to imply that there are large-scale processes at work and, in turn, that it is through them that the folk songs are integrated with art music. Naturally, this raises questions of how those processes are manifest and the effects that they bring about. Stenzl suggests that ‘The Sicilian songs...form the starting points and the nuclei of a score lasting half an hour, six “core pieces” that the music heads towards and moves away from’ (Stenzl, 2001: [n.p.]).

If six amongst the fourteen songs included in *Voci* are markedly more fundamental than the other eight, it is not made obvious to listeners how and why that is so. However, the notion that a group of folk songs might be moved towards and away from is interesting, since it suggests a kind of stylistic arch; perhaps an overall process makes *Voci* somehow ‘thoroughly-Sicilian-folk-music’ in the middle, and ‘not-as-Sicilian-folk-music’ at either end. So simplistic a reading of a simple (and highly illuminating) comment obviously has shortcomings, although it suggests the beginnings of a framework for enquiry as to how Sicilian folk music is integrated. Since stylistic distance is inherent to Berio’s transcription technique, to design a form on that basis would seem to be a logical next step.

There is no single, uninterrupted line of development running from the start of the work to its end. Section divisions are audibly apparent, usually marked by a particular gesture or change of texture, and indeed they are clearly shown in the score, as each folksong is named at its appearance. However, certain oppositions run throughout, as shown below:

Source materials: Folk song	Berio's input: Art music
Foreground melody	Background accompaniment
Soloist	Orchestra
Performer freedom	Composed control
Discontinuity: short, block-like sections	Continuity: large-scale organic form
Form as product	Form as process
Modality	Chromaticism

This might seem like a crude reduction of the complexity and subtlety at work, as the above categories are rarely as recognisably separate as this might seem to suggest. For example, the viola often partially accompanies itself, holding a drone on an open string whilst also playing the melody on another. Indeed, even the conceptually straightforward distinction between soloist and orchestra is brought into question by the presence of two accompanying ensembles. However, this stands as testament to the success of the score, rather than invalidating the list. As a stylistic fusion, the very purpose of *Voci* is to bring such distinctions into question, to blur these divisions.

Interestingly, each member of the left hand column is notionally 'smaller' than its counterpart. Folk music is generally shorter and simpler than art-music, involving comparatively modest resources; modes contain fewer pitches than the chromatic scale; the soloist is an individual performer pitted against (or alongside) a carefully coordinated – composed for – mass. Accordingly, the integration of the two columns concerns the reception of folk song within art music, rather than the other way around. In the course of the form these relationships are played out, their respective members combined in different ways. Thus, the work should be approached as a process-based

form, rather than as one based upon a pre-compositional static model. Fittingly, therefore, it does not easily correspond to its most closely related art-music model.

Concerto: soloist vs. orchestra

Although the title *Voci (Folk Songs II)* refers to folk- rather than art-music, the presence of a solo instrument with a far larger accompanying force has obvious connotations of 'concerto'. The term implies an ongoing opposition between instrumental forces which plays an important part in articulating overall form, as it changes in the course of the work. Historically, various models have framed that relationship. In the Classical Concerto, soloist and orchestra play materials in opposed tonal areas in accordance with a sonata-form scheme. By contrast, in the Baroque Concerto Grosso groups of instruments work together to articulate a ritornello structure, itself based on both contrast and recurrence. Of course, composed in the 1980s, *Voci* does not subscribe directly to either of those models. Forces are continually realigned, sometimes working with and against each other, and at other times giving prominence to particular sections of the orchestra or single instruments. Thus, there are also aspects of both the Classical and Baroque models, and indeed of the Twentieth-century Concerto for Orchestra. In addition, the notion of a 'double concerto' is also turned on its head, due to the presence of two instrumental groups (rather than two soloists).

This suggests a kind of 'concerto free-for-all', which might seem to negate the value of considering this aspect of the work: certainly the present intention is not to assign *Voci* to any particular category. Nonetheless, the concerto element is clearly essential to how the folk songs are placed in an art-music context, since understood at the most basic level, they are given to the viola and accompanied by an orchestra.

Thus, where in earlier models the distribution of materials between soloist and ensemble articulated a large-scale tonal opposition, here it serves to integrate two styles, giving rise to questions of how larger-scale formal processes might be manifest.

Large-scale Form

The form of *Voci* is readily divided into 23 segments in the score, as each of the songs is labelled at its appearance. In turn, these can be grouped into four large-scale sections as shown overleaf. Together, Exx. 8.6&7 provide information regarding two simultaneous ongoing processes; the textural opposition between soloist and orchestra, and the tonal structure. Clearly, a four-part division of *Voci* is justified in both cases, as each large-scale section of the form inheres a new pattern of change at the segment-to-segment level. It would be overly confusing to discuss both of these threads of continuity simultaneously. Accordingly, prior to considering the formal implications of pitch organisation, the textural soloist-ensemble opposition is explained below. In reducing over half an hour of music to this extent, it is necessary to abstract at various levels, and the changing relationship between the viola's melody and the ensembles' accompaniment is considered from two perspectives. Firstly, there are summaries of each of the four large-scale sections in turn, and then particular examples from each of the four stages are discussed in more detail below as 'snapshots' of the concerto relationship.

Ex. 8.6:

Section	Fig	Material	Soloist Vs. Orchestra	Pitch Centre
Opposition	-	Introduction	Soloist	F
	A	Episode: pointillistic dabs of colour	Orchestra	F
	B	<i>A la Sciacchitána</i>	Soloist	F(vs.G ^b)
	G	Episode: repeated notes	Orchestra	F
	I	<i>Ninna Nanna di Carini</i>	Soloist	G
	M	Episode: repeated-note dabs of colour	Playing together	D
	O	<i>Cialoma quando s'issa vela</i>	Orchestra	G
Embodied accompaniment	P	<i>Tunazione de li Catitari</i>	Soloist	G→D
	S	Episode: major 7ths figure	Playing together	D
	V	<i>Abbagnata</i>	Playing together	C
	X	<i>Abbagnata</i>	Playing together	D
	B1	<i>Ninna Nanna</i>	Playing together	C
	D1	Episode: trumpets and piccolos feature	Orchestra	G
Equal partnership	G1	<i>Tubbiana</i>	Soloist	D
	H1	<i>A la Marsalisa</i>	Soloist	D
	N1	<i>Canto di la Voro dei Pescatore di</i>	Soloist	G
	O1	Episode: melodic lines	Orchestra	A vs. B ^b
	R1	<i>Ladata I</i>	Soloist	E
	U1	<i>Ladata II</i>	Soloist	D
	W1	<i>Nota di Monte Erice</i>	Soloist	A
Synthesis	Y1	Orchestral wash of folk song fragments	Orchestra	A
	E2	Soloist 'cadenza': folk song fragments	Soloist	E
	F2	Coda	Playing together	A

Ex. 8.7:

Introduction Episode *A la Sciacchitána* Episode *Ninna Nanna di Carini* Episode *Cialoma quando s'issa la Vela*

Tunazione de li Catitari Episode *Abbagnata* *Abbagnata* *Ninna Nanna* Episode

Tubbiana *A la Marsalisa* Episode *Canto di la Voro* *Ladata I* *Ladata II* *Nota di Monte Erice*

Orchestral 'wash' Cadenza Coda

The musical notation consists of four staves, each representing a different section of the piece. Each staff shows a sequence of notes on a treble clef staff, with the pitch center of each note corresponding to the 'Pitch Centre' column in the table above. The notes are: Introduction (F), Episode (F), *A la Sciacchitána* (F), Episode (F), *Ninna Nanna di Carini* (G), Episode (F), *Cialoma quando s'issa la Vela* (G). The second staff shows: *Tunazione de li Catitari* (G), Episode (D), *Abbagnata* (C), *Abbagnata* (D), *Ninna Nanna* (C), Episode (G). The third staff shows: *Tubbiana* (D), *A la Marsalisa* (D), Episode (G), *Canto di la Voro* (A), *Ladata I* (E), *Ladata II* (D), *Nota di Monte Erice* (A). The fourth staff shows: Orchestral 'wash' (A), Cadenza (E), Coda (A).

- I. Opposition** – In this opening section, the folk songs played by the viola alternate with orchestral episodes containing typical art-music textures. Over the course of the section those textures are synthesised. In the first episode, single staccato pitch-clusters make up a pointillistic texture; in the second, those gestures are used to build a repeated-note ‘fanfare’ chord. These effects are combined in the third orchestral segment, as texturally disjunct groups of demisemiquavers form a background context for the viola.

Ex. 8.8:

The musical score for Example 8.8 is divided into two systems. The first system is in 3/4 time and consists of three staves: Group B (orchestra), Viola, and Group A (orchestra). Group B and Group A play staccato pitch-clusters. The Viola part plays a folk-music melody with a triplet of eighth notes. The second system is in 4/4 time and also consists of three staves: Group B, Viola, and Group A. A box labeled 'N' is placed above the first measure of Group B. The Viola part continues its folk-music melody, and the orchestral parts continue with their pointillistic textures.

As this short passage shows, the soloist plays an equal part in this decidedly art-music texture. Thus the initially straightforward division of forces and materials – the viola playing folk-music melodies, the orchestra playing textural art-music accompaniments – is transformed in the course of the section. Indeed, following this, it is inverted in the final segment, as the folksong *Cialoma quando s'issa Vela* is played by the orchestra.

- II. Embodied accompaniment** – Here the ensembles provide supporting accompaniments to the viola, which become more recognisably characterised as the section progresses. The fully chromatic repeated-note texture of *Tunazione de li Catitari* gradually clarifies to form a perfect fifth, coinciding with that played by the soloist (see Ex. 8.20), preceding a brief episode involving both the viola and orchestra (Exx. 8.21-2). Following this, the bass

lines of both *Abbagnatas* are synchronised with the melody (see Ex. 8.5 above, for example), and *Ninna Nanna di Carini* features a four-part 'chorale' (Ex. 8.11). Overall, therefore, although it is always secondary to the soloist, the orchestra plays an increasingly embodied role, changing from a mere background texture to fully-fledged homophony.

III. Integration – The increasing importance of the accompaniment in the second section results in equality between forces in the third. Perhaps these folksongs are what Stenzl refers to as the 'six core pieces.' In them, the folk- and art-music divide between soloist and orchestra seems to be broken down, as the ensembles are given counter-melodies. *Tubbiana* is set against trumpet lines, for example, and the accompaniment of *A la Marsalisa* is made up of fragments of the tune itself. In *Canto di la Voro dei Pescatore* the orchestra is the equal opposite of the soloist as discussed below (Ex. 8.12), after which the ensembles play counter-melodic material once again in *Ladatas I&II*. The last of the source materials, *Nota di Monte Erice*, marks the culmination of this 'equalising' process. It is the only folk song in which the soloist and ensemble are rhythmically coordinated throughout, and after 16 bars the only silence in the work occurs (see Ex. 8.9).

Ex. 8.9:

The musical score for Ex. 8.9 consists of four staves. The top staff is for Strings (Group B) in treble clef, showing a series of chords with a '5" Y1' annotation above it. The second staff is for Celesta + Vlns, Fl. (Group A) in treble clef, with a '(Fl.)' annotation above it. The third staff is for Viola in treble clef, with a '(Cb.)' annotation below it and a '5" pont. ord. tasto' annotation above it. The bottom staff is for Strings (Group A) in bass clef, with a '(Cb.)' annotation above it. The score is in 3/4 time and features a waltz texture.

Clearly, there is some significance attached to this moment: perhaps Berio's comment on the folk song arranging tradition is complete. Certainly, this waltz texture is the most typical of a conventional 'folk song arrangement' in the score. Arguably, by this point, folk- and art-music have been fully integrated, the soloist-ensemble opposition having been fully played out to the extent that they are equal partners.

IV. *Synthesis* – in contrast with the opening section, in which the soloist played folk songs and the orchestra mere accompanying textures. here, both partners have melodic material. As shown below (Exx. 8.13&14). they take turns in playing music constructed out of fragments of various of the source materials. The form ends in a Coda in which the two forces share the same, non-folk-like material.

Textural Snapshot I: Ninna Nanna di Carini

Ninna Nanna di Carini is taken from the first section of the work, which is characterised by an opposition between the folk songs of the viola and the material given to the orchestra. As explained above, this is manifest chiefly through the alternation of orchestral episodes and segments featuring the viola. This leaves open the question of how the melodies relate to their accompaniments; and demonstrably in this instance, the answer is ‘minimally’. For presentational reasons, Ex. 8.10a shows the first line of melody alone, and Ex. 8. 10b shows a single page of score. The viola plays at its own pace, independent of the ensemble, which merely sustains three pitches, F, G and C[#] in a shimmering drone. This provides a harmonic ground for the melody, confirming G as the centre of its Mixolydian mode (rather than E as the centre of its Phrygian, suggested by the voice-leading of the opening notes of the tune; see Ex. 8.10a). The C[#] is foreign to that collection, although the dissonance implied by its presence is not functional. Rather than bringing about a necessity for resolution, the harmony remains static.

Exx. 8.10a&b:

♩ = 50 ca. (NINNA NANNA DI CARINI)

J

B

J

A

In the place of harmonic motion, the interest in the accompaniment lies in its movement through physical space. There is a 'V' shape in the score, its arms extending from the viola 1 and 'cello 1 entry at letter J down to the trombone C² in the next bar and back up to the viola 1 trill two bars later. The effect is that the minor seventh G-F moves quickly from the left to the right extreme of the back row, and then back again more slowly, having been transformed into alternating trills, that deceleration having been initiated by the slowing wa-wa oscillation of the trombone. Subtle though this is, it is merely a surface effect, as explained above. Despite this carefully controlled *textural* momentum, there is no *temporal* momentum, as the passage of time is not marked by changes of state: the viola melody simply continues, unaffected by the accompanying drone.

Thus, the relationship between soloist and orchestra remains constant in *Ninna Nanna di Carini*. Since the overall form merges the styles associated with those two forces, it is hardly surprising that they do not interact in this opening section (before the process has properly begun). Paradoxically, in this folk song, the opposition between viola and ensemble(s) is manifest as a lack of anything substantial set against the melody. Fittingly, the soloist plays this lullaby above a passive, gentle accompaniment.

Or perhaps it is not so fitting. In her article '*Ninna-nanna-nonsense? Fears, Dreams, and Falling in the Italian Lullaby*', Luisa Del Giudice points out that 'Inducing sleep through the use of lullabies affords the mother an opportunity for reflection and self-expression, ... [and] on occasion also venting unacknowledged private grievances in a form of unheard confession' (del Giudice, 1988: 286). Playing upon the relationship between words and music is central to Berio's output, and undoubtedly informed his approaches to presenting the source materials. However,

this is not the place for an investigation of meaning in folksong lyrics. Importantly, *Ninna Nanna di Carini* is not the only cradlesong in *Voci*, and the next example leaves listeners far less at ease.

Textural snapshot II: Ninna Nanna

There is an inherent sense of conflict which pervades this second lullaby. Occurring at the end of the second formal section, arguably it arises on account of the more fully-embodied relationship between soloist and orchestra (see Ex. 8.11).

Ex. 8.11:

C₁ $\frac{3}{4}$ ♩ = 64 ca.

The musical score for Ex. 8.11 is a complex orchestral and soloist arrangement. It features multiple staves for various instruments, including Violins (Va. 1^a, Va. 2^a), Violas (Vi. 1^a, Vi. 2^a), Cellos (Cb. 1^a, Cb. 2^a), Double Basses (Cb. 3^a), Flutes (Fl. 1^a, Fl. 2^a), Clarinets (Cl. 1^a, Cl. 2^a), Saxophones (Sax. 1^a, Sax. 2^a), Trumpets (Tr. 1^a, Tr. 2^a), Trombones (Tbn. 1^a, Tbn. 2^a), and Piano (P). The score includes dynamic markings such as *ppp*, *pp*, and *ppp*, and performance instructions like *arco*, *ord.*, *senza tremolo*, and *atco*. The tempo is marked as $\frac{3}{4}$ ♩ = 64 ca. The score is divided into two systems, with the second system starting with a large 'B' in the left margin. The soloist part (Va. sola) is written in a different clef and key signature than the orchestra.

B

C₁ $\frac{3}{4}$ ♩ = 64 ca.

There are three textural layers here: the *Ninna Nanna* melody, a 'chorale' played by a quartet of orchestral instruments, and sustained pedals in the ensemble. The modal affinities of each are respectively weaker. The viola strongly projects C as a modal fundamental: each phrase starts with a cadence (immediately preceding Ex. 8.10b, the viola has a crotchet G), initiating melodic lines which do not stray from the Aeolian mode on that pitch. The influence of this tonal gravity extends as far as the four-part 'chorale'. Its upper voices encircle C and G respectively, while the lower two repeatedly move between mode-defining pitches (C and E² in the case of the trumpet, and A^b and C for the horn), the paths followed by both those instruments involving semitonal resolution to the fundamental. All of this occurs over sustained pedal tones principally emphasising the fundamental and fifth (which are doubled by string and brass instruments), as well as the second, third and fourth degrees of the mode. Gradually however, this modality becomes blurred as more pitches are added to the drone, and in the bars following Ex. 8.11 chromatic saturation ensues.

The soloist is rhythmically independent of the orchestra, and that lack of temporal coordination ensures that no functional relationships can occur between the two forces – they cannot play together. However, they are marked to play at the same approximate tempo, and since the same structural pitches are projected in various parts of the texture, there is some interaction, as, quite literally, they *almost* play together. This is over and above the kind of passive harmonic support arising merely from sustained pitches in the previous example. In the second formal section the ensemble provides an active, multi-layered texture as accompaniment.

Textural snapshot III: Canto di la Voro Dei Pescatore di Corallo

Canto di la Voro Dei Pescatore di Corallo belongs to the third stage of the formal process, in which the soloist and orchestra are equal partners. An excerpt is shown below in Ex.8. 12.

Ex. 8.12:

N1

Group B

(Woodwind)

(Strings)

Viola

Flute

Vla.

Fl.

The two forces support each other texturally, as the jerky rhythms of the folk song are reflected in the accompaniment. Indeed, at the start of the excerpt, the soloist and orchestra are synchronised. Harmonically speaking, though, the forces work against each other: the viola plays in a major mode based on G, whilst the ensemble plays

clusters containing almost the full chromatic scale. That opposition is retained throughout this folk song setting, contributing to a sense of equality which is fully realised in the final section.

Textural snapshots IV: 'Orchestral wash' and 'Cadenza'

As is typical of this Berio's output during this period, the final section of the form serves as its summation (Belinfante, 1989: 71). There are three segments, and in the first two (shown in Exx. 8.13&14), the orchestra and soloist respectively play music built out of fragments of all of the folk songs, followed by a 'Coda' containing no folk material, in which they play equal parts. Thus, there is an obvious resonance with the recapitulation, cadenza and coda in Classical concerto form, implying that the fundamental opposition between the instrumental forces is resolved. Here however, rather than through tonal resolution, that completion is attained by a balancing-out in the distribution of materials. Excerpts from the orchestral wash and 'cadenza' are shown below.

Ex. 8.13:

from Episode:
major 7ths

*Balletto di
Ciaramedde*

reminiscent
of *Ladada II*

*Canto di la
Voro dei
Pescatore
di Corallo*

Ex. 8.14:

The musical score for Ex. 8.14 is divided into two systems, labeled B and A. The first system (B) includes parts for Perc. 2^a, FL 1^a, Perc. 3^a, Vla. sola, FL 3^a, and Perc. 1^a. The second system (A) includes parts for Perc. 2^a, FL 1^a, Perc. 3^a, Vla. sola, Cl. b., and Perc. 1^a. The score is divided into sections: *Nota di Monte Erice (accompaniment)*, *Balletto di Ciaramedde*, *Cialoma quando s'issa la vela*, *Canto di la Voro dei Pescatore di Corallo*, and *A la Sciacchitana (accomp.)*. The score features various musical notations such as dynamics (*ppp*, *p*, *f*, *pp*), articulation (*pizz.*, *pont.*), and tempo markings (*accel.*, *sub.*).

At the start of the form, the source materials and art-music elements were strictly segregated, belonging to the soloist and ensembles respectively, whereas in this final section they are distributed evenly. Overall therefore, the formal process breaks down the division between soloist and orchestra in four large-scale stages, and this surely contributes to the fusion of folk- and art-music. In the course of the form, the notion of melody as the sole province of the soloist with a secondary orchestral accompaniment is challenged, as the ensembles play an increasingly active role in opposing the viola.

In each of the examples discussed above, the relationship between melody and accompaniment is underpinned by differences (or similarities) in pitch organisation.

Running alongside the textural opposition is a process by which folk-music modality is integrated with fully chromatic art-music material, as explained below.

Pitch Organisation and Modal Immersion

From the point of view of pitch organisation, to understand the fusion of folk- and art-music is to understand how modality is received in a fully chromatic context. Unsurprisingly, given that there are fourteen songs in this half-hour work, this occurs more than once and can be seen to function at a number of levels. In essence, the question is how the harmonically static folk songs are incorporated within an ongoing formal process. The source materials are reduced to a sequence of modal fundamentals in Ex. 8.15, a map of the global pitch structure of *Voci*:

Ex. 8.15:



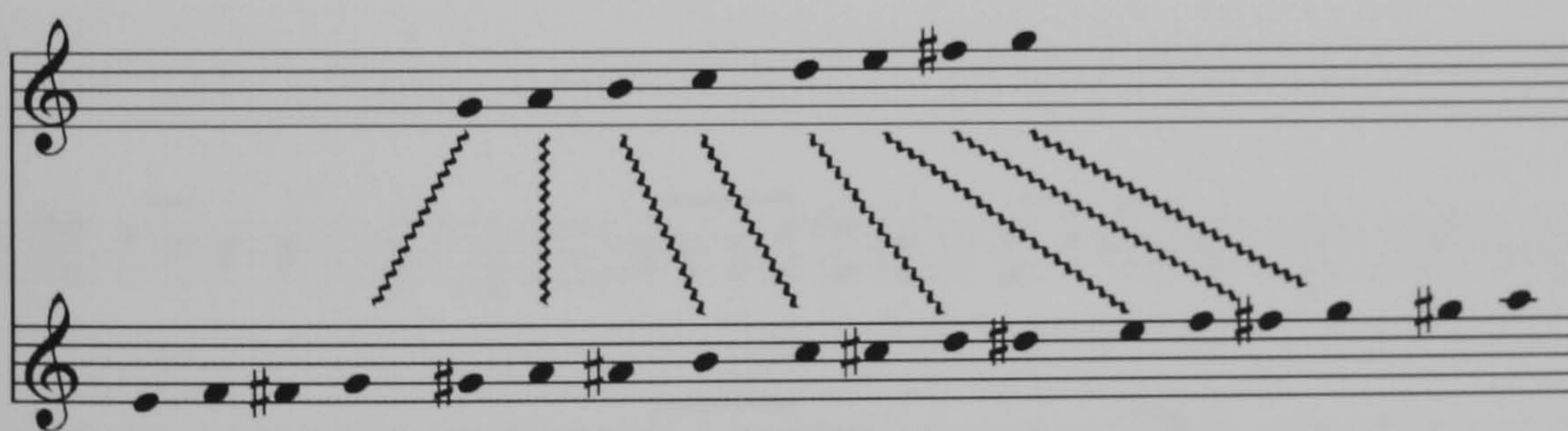
The four sections bring about an overall motion from F to A and can be grouped into two 'dynamic-static' pairs. The first section brings about motion from centrality on F to G, the second being a stationary elaboration on that new modal fundamental. This precedes a move towards A as a centre during the third, which is confirmed in the final section. Notably, the members of the structure are fifth-related, conforming to two inter-locking pentatonic scales as shown. Thus, folk music is inherent to the underlying shape of the viola part as well as its surface characteristics.

The matter at hand, though, concerns how this modal skeleton interacts with chromatic, art-music textures to form a dynamic tonal shape. This has implications for the passage of time. Since there are no modulations providing transitions from one folk song to the next, the issue is how this vertical division of *Voci* is made horizontal. The simple harmonic theory behind that temporal unfolding is explained below and demonstrated in relation to a single folk song, with its subsequent orchestral episode. Following that, its larger-scale formal implementation is discussed.

Modal immersion: Tunazione de li Catitari

Folk-song modes are notionally smaller than the chromatic scale, since they contain fewer pitch classes. Thus, they can easily be transformed into the total chromatic by the addition of those which are 'missing', as shown below.

Ex. 8.16:



Modality is literally received in a chromatic context. Here, the Ionian mode on G loses its characteristics, becoming 'immersed' as the octave is saturated. Similarly, the reverse is possible; that collection emerges as pitches are taken away from the total chromatic, and this has obvious connotations regarding stylistic identity. Metaphorically speaking, as the modes on which its songs are based become submerged, the Sicilian folk-music voice is drowned out.

The clearest example of how this theory is put into practice occurs in *Tunazione de li Catitari*. After an initial fanfare which sets the opening phrase of the tune against itself (and *Balletto di Ciaramedde*) at various speeds, the setting begins proper. The melody itself is harmonically fixed, at no point straying from the Ionian mode on G. Nonetheless, there is some interplay between mobility and stasis at a surface level, as the viola part consists of a melodic line played against a drone. The first verse is shown below (see Ex. 8.17).

Ex. 8.17:

The image displays two systems of musical notation for Ex. 8.17. Each system consists of three staves: Viola (Vla.), Melody, and Drone. The music is written in a 3/8 time signature with a key signature of one sharp (F#). The first system shows the beginning of the first verse, where the Viola and Melody parts play a melodic line against a drone. The second system shows the continuation of the first verse, with the drone changing between pitches as the melodic descent passes between G and D. The second system also shows the beginning of the second verse, which is transposed up a perfect fifth from the first.

As the melodic descent passes between G and D, the drone changes between those pitches. This does not bring about a change of tonal centre within the verse, as the melody remains based in the Ionian mode in G. The second verse, though, is transposed up a perfect fifth. As such, there is pentatonic motion both within each verse and from one to the next, which in turn suggests temporal directionality. The

switch of modal centre from the first verse based on G to the second on D, implies that by the end of *Tunazione* the music has moved, albeit extremely abruptly, through time. The suddenness of that harmonic shift in the viola part reflects the discontinuous, block-like nature of the folk-song forms overall. Importantly, this is set against an orchestral accompaniment which creates continuity, bringing about ongoing relationships underpinned by a large-scale process of modal immersion.

There are three textural layers in the accompaniment: the high woodwind play repeating melodic mobiles, the brass sustain pedals of D and A, and a repeated-note cluster grows in the strings and percussion. They are represented in Ex. 8.18. (NB this is a mere reduction of the texture at the opening of *Tunazione*: the piccolos and E^b clarinet each play a variation on the figure shown; only the initial string cluster is shown; the vertical alignment of the notes of the brass has no implications for synchronisation.)

Ex. 8. 18:

The musical score for Ex. 8.18 consists of three staves. The top staff, labeled 'High Woodwind', shows a melodic line starting with a double bar line, followed by a series of notes: a quarter note, an eighth note, a quarter note, a quarter note, a quarter note, and a quarter note, with a repeat sign at the end. The middle staff, labeled 'Strings', shows a cluster of notes with a sharp sign, followed by a series of notes with a '5' above them, indicating a fifth interval. The notes are grouped into two sections, each labeled '(Group B)'. The bottom staff, labeled 'Brass', shows a sustained pedal point with a '5' above it, indicating a fifth interval.

Different degrees of stasis and mobility are inherent to each of these three elements. The brass pedals are by their nature the most static, although even they bring about a sense of growth as they are gradually doubled in more and more octaves. Effectively, they serve merely as timbral support for activity in the strings. Prior to discussing that

layer, the implications of the relationship between the woodwind and the viola should be explained.

The high-woodwind mobiles are repetitious by nature and thus also imply stasis, although in the second verse they change to a rhythmically articulated pedal G. Since this coincides with the switch from G to D in the viola, the relationship between soloist and woodwind changes from one based in thirds to one in bare fifths (see Ex. 8.19).

Ex. 8.19:

The musical score for Ex. 8.19 consists of three staves. The top staff is for Piccolo, starting with a 'Q' in a box. It features a melodic line with a trill-like figure and a triplet of eighth notes. The middle staff is for Viola, showing two verses: '(Verse 1) (etc.)' and '(Verse 2) (etc.)'. The bottom staff is labeled 'Composite Structure' and shows two chordal structures. Arrows point from the Viola and Piccolo staves to these structures, indicating the intervallic relationship between the instruments. The first structure shows a trichord (B-C#-D) with arrows pointing to the Viola and Piccolo. The second structure shows a similar trichord (D-E-F#) with arrows pointing to the Viola and Piccolo.

This contributes in no small measure to the overall sense of expansion in *Tunazione*, although the continuity underlying that process lies in the activity in the strings.

As shown in Ex. 8.18, to begin with, the melody is accompanied by the trichord B-C#-D, which moves around the performance space as it is passed between the violins in groups A and B. Over the course of this formal segment, other strings add other pitches, which are subsequently removed from the texture. The overall pattern is shown in Ex. 8.20.

Ex. 8.20:

Ex. 8.20 consists of two staves. The top staff is for the Viola, written in treble clef. It starts with a half note G3, followed by quarter notes A#3, B3, C4, D4. Above the first two measures is the label '(Verse 1)'. The next measure has a half note E4, then a quarter note F4. Above these two measures is the label '(etc.)'. The following measure has a quarter note G4, then a quarter note A4. Above these two measures is the label '(Verse 2)'. The next measure has a quarter note B4, then a quarter note C5. Above these two measures is the label '(etc.)'. The staff ends with a double bar line and a repeat sign. The bottom staff is for the Orchestra, written in bass clef. It starts with a half note G2, followed by a half note A2. The next measure has a quarter note B2, then a quarter note C3. The following measure has a quarter note D3, then a quarter note E3. The next measure has a quarter note F3, then a quarter note G3. The following measure has a quarter note A3, then a quarter note B3. The next measure has a quarter note C4, then a quarter note D4. The following measure has a quarter note E4, then a quarter note F4. The next measure has a quarter note G4, then a quarter note A4. The final measure has a quarter note B4, then a quarter note C5. The staff ends with a double bar line.

The idea of modal immersion could hardly be realised any more clearly than in this folk song. As shown, the orchestral pitch content increases to include all but one member (F^b) of the total chromatic and then decreases to form the perfect fifth D-A, coinciding with the viola at the end of the second verse. Thus, the initial modality is submerged and another emerges through this process, rather than through any sort of modulation. The abrupt structural shift from G to D as tonal centre is ‘cushioned’ by the total chromatic, such that its sudden impact is softened; the vertical is made to be more horizontal as folk- and art-music are fused.

The immersion process continues in the orchestral episode following *Tunazione*, which begins with a repetition of the fanfare which opened the folk song underpinned by the bare fifth D-A and ends in a totally chromatic tutti chord. Unsurprisingly, given that this orchestral episode is by definition not a folk song setting, and is thus more closely allied with art-music, that continuation is of a markedly different nature. In the table above, the episode is named ‘major 7ths’ on account of the viola part, which consists of variations on the following figure.

Ex. 8.21:

Ex. 8.21 is a single staff for the Viola, written in treble clef and 4/4 time. It starts with a quarter rest, followed by a quarter note G3, then a quarter note A3. The next measure has a quarter note B3, then a quarter note C4. Above these two notes is a slur. The following measure has a quarter note D4, then a quarter note E4. Above these two notes is a slur. The staff ends with a quarter rest. A dynamic marking of *f* (forte) is placed below the first note.

Melodic fragments are also played by the orchestra, and collectively they have the same effect, of projecting centricity on D. Presently the accompanying vertical sonorities which run throughout this section are of more interest. Those in the second to the fifth bar are reduced below (see Ex. 8.22a)

Ex. 8.22a:

Group B
(upward stems)

Group A
(downward stems)

The score consists of two systems of piano accompaniment. The first system is in 4/4 time and features two staves. The upper staff, labeled 'Group B (upward stems)', contains melodic lines with upward-pointing stems, including a triplet of eighth notes and a marked chord with an asterisk. The lower staff, labeled 'Group A (downward stems)', contains chords with downward-pointing stems, including a triplet of eighth notes. The second system is in 5/4 time and also features two staves. The upper staff continues the melodic lines with upward stems, including a marked chord with an asterisk. The lower staff continues the chords with downward stems, including a triplet of eighth notes.

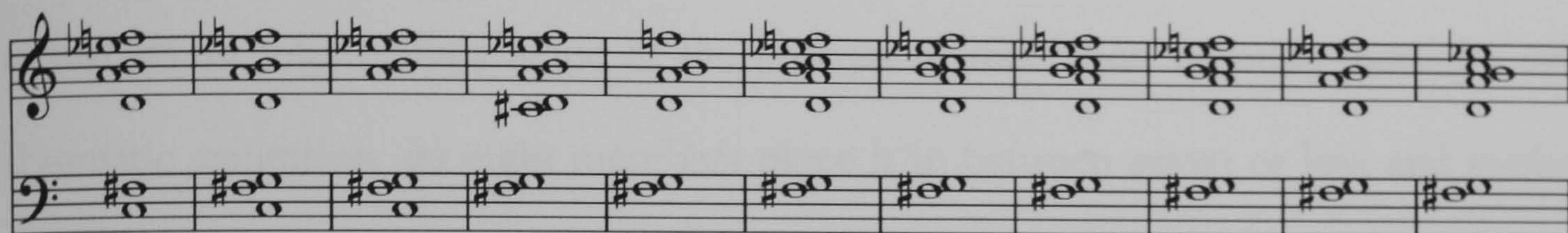
Ex. 8.22b:

The score shows a chord structure in two staves. The upper staff is in treble clef and contains a chord with notes G4, A4, B4, and C5. The lower staff is in bass clef and contains a chord with notes G2, A2, B2, and C3. Both staves have a key signature of one sharp (F#).

It is not necessary to perform a set-theoretic analysis on these chords to recognise that they have extremely similar, and in many cases identical, intervallic profiles. Effectively, the same harmonic shape, characterised by whole-tonal intervals – tones, major thirds and tritones – moves through pitch space. A particular transposition of this chord (marked * in Ex. 8.22a and shown in Ex. 8.22b), based on the C below

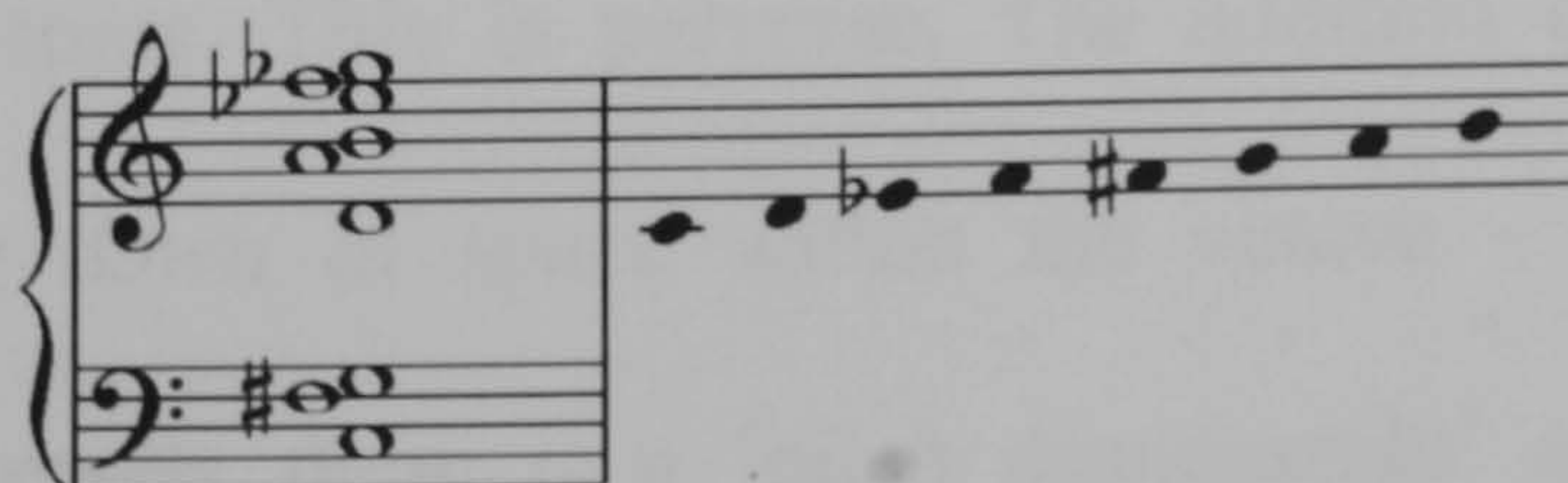
middle C, recurs frequently. At its various appearances throughout the episode, certain of its members are missing, or others added. The different versions are shown in the order below.

Ex. 8.23:



A defining characteristic of each of the final seven appearances is that they contain two superimposed bare fifths stacked atop each other: G-D-A. This marks a contrast with the whole-tone voicings at the start of the episode (Ex 8.22a). It could be argued, therefore, that the chord is manipulated so as to bring out its pentatonic folk-music characteristics, rather than its art-music whole-tonality. Listeners are unlikely to infer a transformation at the level of style from so small a change in the nature of materials, though. Rather, the pitch organisation of this section as a whole marks it out as distinct from modal passages, as non-folk, art-music material. Indeed, the chord is used in many of the orchestral episodes throughout the form. Accordingly, it is worthwhile considering this vertical sonority as an ongoing horizontal collection (see Ex. 8.24).

Ex. 8.24:



From one point of view this chord represents the fusion of folk- and art-music in that it comprises the pitches of the open strings of the viola, C-G-D-A, decorated with other chromatic pitches. More substantially, by flattening the D or the B, or sharpening the G, the collection can be transformed into an octatonic scale, and at various points in the form that characteristic is brought out. Thus, this sonority represents an intermediate stage in the process of mediation between modality and chromatic saturation; its eight members place it in between seven or less and twelve pitches in the octave. Perhaps this helps to explain its prominence in the various orchestral episodes – bridge passages between the folk songs. Accordingly, it is referred to below as the ‘transition chord’. At a global level, pitch space expands and contracts throughout the form: as more pitch classes are added, the octave becomes more tightly compact, there being less space available within it. Given the Italian folk-music connotations of the accordion, this might be thought of as a ‘squeezebox’ effect: the octave is in a constant state either of opening up, allowing the modality of the folk songs to come through, or closing down, turning in on itself as it becomes saturated.

Global Form and the Squeezebox Effect

This notion of an ongoing process of contraction and expansion implies patterns of intensification and relaxation, and accordingly, the squeezebox effect might be represented using hairpins. This is perverse. The addition of pitch classes to the texture – the *closing down* of space within the octave – brings about a ‘pitch crescendo’; and conversely there is a ‘pitch diminuendo’ as more-open modality emerges. In spite of that apparent contradiction, the diagrams below show how this

effect functions differently in each section of the form, blurring the change from centricity on one pitch to the next as different modalities are immersed in chromatically saturated textures. Overall, the form brings about global motion from F to G to A, as shown in Ex. 8.15, and internal changes of modal centre provide each of the four large-scale sections with a basis for completion on its own terms.

Squeezebox effect: Section I

The first section consists of alternating folksongs and orchestral episodes; and, although there is no single, uninterrupted pattern, an overall process occurs in which pitches are gradually added to and then taken away from the texture, as shown below.

Ex. 8.25:

The diagram consists of three horizontal staves. The top staff, labeled 'Modal Centre', shows a sequence of notes: F (Introduction), G (Episode), A (A la Sciacchitana), G (Episode), F (Ninna Nanna di Carini), G (Episode), and A (Cialoma quando s'issa la vela). The middle staff, labeled ''Squeezebox' effect', shows a black wedge that starts wide at the beginning of the Introduction and narrows to a point at the end of the Ninna Nanna di Carini section. The bottom staff, labeled 'Prominent, sustained, or recurrent sonority', shows a series of chords: a triad of F, G, and C# in the Introduction; a cluster of F, G, C#, and D in the first Episode; a cluster of F, G, C#, D, and E in the A la Sciacchitana section; a cluster of F, G, C#, D, E, and Bb in the second Episode; a cluster of F, G, C#, D, E, Bb, and B in the Ninna Nanna di Carini section; and a cluster of F, G, C#, D, E, Bb, and B in the final Episode. Vertical dashed lines separate the sections.

The saturation process is clearly audible at the outset. In the *Introduction* the soloist plays an ongoing rhapsody, consisting of gestural fragments of the folk songs to appear later in the work. By way of accompaniment, the orchestral strings 'pick out' pitches from the viola part and sustain them as drones. To begin with, F, G and C# are held, and as more pitches are included a cluster chord results. The last one to be added is a pedal G#, which is sustained into the following episode, making the transition chord fully octatonic (with the addition of E^b). That sonority is sustained at the start of

A la Sciacchitana, although towards the end of the first verse (five 'bars' after figure C), the texture is fully chromatic. Indeed, since the transcription is microtonal (see Exx. 8.3a&3b), the octave is fuller still.

That apex of the saturation process necessitates a reduction in pitch content, and in the ensuing episode a repeated-note octatonic sonority is sustained, before *Ninna Nanna di Carini* is accompanied using only G, F and C#, as mentioned above (Ex. 8.10b). Thus, a rotation process underlies this section as a whole. Those three pitches are present almost throughout, although where centricity was on F in the *Introduction*, it moves to G after chromatic saturation. In the last episode of the section, pitch content increases to include a variation on the transition chord. However, no forward motion is implied: the authority of G as fundamental is maintained in *Cialoma quando s'issa la Vela* and beyond, into the second section of the form.

Squeezebox effect: Section II

The modal structure of the second formal section is far simpler than that of the first. As shown in the diagram below, it follows a symmetrical pattern: outer segments centred on G frame an alternation between D and C as fundamentals (see Ex. 8.26).

Ex. 8.26:

	<i>Tunazione de li Catitari</i>	Episode	Abbagnata	Abbagnata	<i>Ninna Nanna</i>	Episode
Modal Centre	G	G	G	G	G	G
'Squeezebox' effect	Black diamond	Black diamond			Black diamond	
Prominent, sustained, or recurrent sonority	Complex chordal structure with arrows pointing to G, F, and C#	Vertical bar	Complex chordal structure	Complex chordal structure	Complex chordal structure	Complex chordal structure

Following *Tunazione*, there is a central triptych comprising the *Abbagnatas* and *Ninna Nanna*, the beginning and the end of which are marked by chromatic saturation. There is textural continuity between the first two of those melodies, as in both, a bassline is synchronised with the scalar viola part. Further, there is a clear sense of balance to this subsection, as major and minor modes are used in both D and C (the first *Abbagnata* balances out *Ninna Nanna* as shown; the second *Abbagnata* can be split into three parts, the outer two taking F[♯] as the third degree of the mode, the inner one, F[♮]). In accordance with the fixed, symmetrical shape of the formal section as a whole, there is no deeper continuity or dynamic process. These three inner segments are static blocks, with no transitions: it is only a slight simplification to say that the final chord of one is sustained as the next begins.

Like the abrupt changes between segments, chromatic saturation occurs far more rapidly than previously in this section. As shown on the diagram, the octave fully contracts and expands in the course of single folk songs at a time. Thus, the more localised squeezebox effect becomes literally that – a surface effect. In the first section of the form, modality played a secondary role to a large-scale immersion process. Here, that relationship is inverted; the total chromatic is used as colour within a rigid modal structure. Nonetheless, saturation occurs at structurally significant points, and the transition chord also plays its role as an intermediary between those two states of modality and chromaticism. Notably, the tessitura of that sonority is extended in the final episode in comparison with its previous appearances. This initiates a process of contraction which extends beyond the end of the episode.

Squeezebox effect: Section III

In terms of the global pitch structure, the third section brings about movement from G to A, and accordingly there is a greater sense of forward momentum and continuous process than earlier in the form. As well as the new phase in the relationship between soloist and accompaniment (the orchestra plays counter melodies in this section), this renewed vigour arises due to changes in pitch organisation and content. A broader range of centres are used than in previous sections, including two new ones, A and E (see Ex. 8.27).

Ex. 8.27:

The diagram for Ex. 8.27 is divided into sections: *Tubbiana*, *A la Marsalisa*, *Canto di la Voro dei Pescatore*, *Episode*, *Ladata I*, *Ladata II*, (Transition), and *Nota di Monte Erice*. It features three horizontal tracks:

- Modal Centre:** A single treble clef staff showing a sequence of notes: G, A, B, C, D, E, F, G.
- 'Squeezebox' effect:** A track with a black shaded area that starts wide under *Tubbiana*, narrows through *A la Marsalisa*, and widens again under *Canto di la Voro dei Pescatore*.
- Prominent, recurrent, or sustained sonority:** A grand staff (treble and bass clefs) showing chordal structures. A thick vertical bar is placed under *A la Marsalisa*. Arrows point from this bar to specific notes in the *Canto di la Voro dei Pescatore* section.

Squeezebox effect: Section IV

The final section of the form has an implied I-V-I structure, supporting centrality on A, as shown below.

Ex. 8.28:

The diagram for Ex. 8.28 is divided into sections: *Orchestral Wash*, *Cadenza*, and *Coda*. It features three horizontal tracks:

- Modal Centre:** A single treble clef staff showing notes: A, B, C, D, E, F, G, A.
- 'Squeezebox' effect:** A track with a black shaded area that starts wide under *Orchestral Wash* and tapers to a point under *Cadenza*.
- Prominent, recurrent, or sustained sonority:** A grand staff (treble and bass clefs) showing chordal structures. A thick vertical bar is placed under *Orchestral Wash*. A box in the treble clef staff under *Coda* highlights a specific chordal structure.

As explained above, the first segment presents an orchestral wash comprising parts of many of the folk songs; and, correspondingly, many tonal centres are projected. Clearly however, A has authority overall, since the bass line continually moves between that pitch and its fifth, E. Eventually A itself is presented as a tonally functional dominant pedal (nine bars before fig. D2), although rather than resolving, it initiates a process of chromatic saturation leading to the cadenza. Similarly, in that penultimate segment, several pitch centres are projected, reflecting the various sources of its melodic fragments. However, once again the authority of A is confirmed, as the cadenza starts with a semitonal resolution to E (as a secondary dominant) and concludes as the soloist repeatedly plays A.

The *Coda* comprises three orchestral fanfares, rooted on F, E and E respectively, which in combination imply a dominant progression moving towards A. Certainly that is the last to be heard in *Voci*, and is projected as modal centre by the viola throughout this final segment, although there is no associated feeling of finality. Interspersed with the fanfares, the soloist plays a pedal A in this section and the following, repeating idea:

Ex. 8.29:



Consisting of a perfect fourth, a tritone and semitones, this motif is the final manifestation of the synthesis of modality and chromaticism to appear in *Voci*. Fittingly, therefore, although at one level there is resolution, there is an overriding implication of a need for continuation, or at least of the potential for it (the accompaniment also consists of small-scale repeated patterns). Indeed, this reflects

the global tonal scheme: rather than a descent to a predefined final tonic, the ascent from F up to A is open-ended. Perhaps the implication is that the balance between Sicilian folk and contemporary art music voices – the process of stylistic synthesis between old and new – is an ongoing process which occurs beyond the confines of *Voci*.

Chapter 9

In Conclusion

The starting point for discussion was the extraordinary versatility of networks as a concept: they can adapt to threat and continually change in nature. Taking that notion as a starting point, a broad range of music has been considered, and accordingly, in response to contemporary culture, diverse manifestations of communication have been discussed. By definition, networks are inclusive, but somehow they remain tantalisingly inconclusive. Accordingly, rather than provide definitive closure, this final chapter draws together some of the threads which run through the thesis. The intention is not to prove the absolute validity of a particular 'network theory', but to reflect upon how ideas running through the various case studies might be related, and shed light on music as communication; to reflect upon the thesis is a network unto itself.

Any thesis is open to attack, and, presently, one of the strongest criticisms which might be made is that the findings of the research might have been more explicitly meaningful had a single analytical method been applied consistently throughout. The defence against such criticism is as simple and potent as the thought underlying the thesis: in contemporary culture, musical meaning is manifest in diverse ways, and the understanding of it must be similarly diverse. Indeed, the examples discussed here were chosen, to some extent, precisely because they are not readily comparable. As explained in Section 1, both explicitly and implicitly, formalised approaches to understanding musical communication tend to be restricted to particular repertoires (in the case of Klumpenhouwer Networks or Lerdahl and

Jackendoff's *Generative Theory of Tonal Music*), or to be bound to considering particular types of communication (as is the case for semiotics). In applying such methods, the questions asked of music tend to be rather narrow, so that the answers they provide can be justified in relation to their respective theoretical frameworks.

A major strength of using as simple and flexible a notion as a network to underpin discussion is that it enables – indeed promotes – breadth of discussion. Rather than dictate the form in which ‘answers’ will come, considering how music communicates through networks invites continual reinterpretation of what the ‘questions’ actually are. Thus, the value of the preceding chapters lies in the open-ended processes of questioning contained within them, rather than in any (un)satisfactorily ‘closed’ product which they might constitute. This is in keeping with the listener-based approaches adopted herein: because the case-study pieces are so diverse, at some level, each one asks listeners how it might be perceived to be meaningful. Nonetheless, there is a need to consider them alongside one another, in order that the distributed significance of the thesis be appreciated.

Undoubtedly, the most perplexing challenge in doing so arises because there is no inherent familial relationship between the works analysed. There is no definitive set of connections between these case studies; there are very few factors whose manifestations might be compared from one to the next. In certain cases – for example, the Ligeti, Debussy and Stravinsky chapters – the work in question communicates by hindering (and thus informing) listeners’ grouping processes, by obstructing (thus guiding) the formation of a perceptual network; and the manner in which it does this forms the basis for discussion. In other cases, such as *Voci* and *Black Angels*, it is the *implications* of the connections invited by the musical

(net)work under scrutiny that provide the basis for significance. Thus, in conclusion, the questioning process continues: the task is one of thinking about the *extent to which* there is any common listening experience.

The pieces were chosen as examples of the many approaches to composition – and listening – in twentieth-century music. They are not proposed as representative of that period but are intended to reflect the many manifestations of music in the last century. Each is highly influential within twentieth-century composition, its significance having import for musical thought. The intention, however, is not to trace a historical line of compositional development: after all, modern technology allows us to hear all of these works outside of the context of musical history, even in a single afternoon. Rather, just as listeners negotiate their own ‘routes’ through networks, this final chapter considers various ways in which the listening experiences offered by these works might be related. For listeners, comparison is the fundamental basis of music as communication, since meaning is derived from their perceptions of relationships – varied types, extents, and placements of difference(s) – between sounds. As such, the attempt to draw lines of connection between these case-studies is effectively a meta-comparison: it implies the comparison of comparison itself. Therefore, any common ground between them necessarily inheres a high level of abstraction.

Musical time and space: perceptual ‘size’ and ‘shape’

As networks, all of the pieces present relationships between ‘points’, and one way of comparing how the works communicate is to consider the characteristics of those perceptual units. Chronologically, the list is as follows: *Jeux* (1913), *Kontakte* (1958-

60), *Atmosphères* (1961), *Requiem Canticles* (1965-6), *Black Angels* (1970), *Voci* (1984). Inasmuch as there is a larger-scale pattern, then the perceptual units decrease in 'size' towards the middle of the list. Moving towards the high-modernist phase in the middle of the twentieth century, networks of *composition* seem to invite perceptual connections between things which 'contain less time'. In *Jeux*, the network of construction concerns interactions between motivic shapes, whereas by *Kontakte* listeners are presented with a sequence of moments (which, admittedly, come in various sizes, although conceptually they are manifest as single instants); and in *Atmosphères*, things are reduced to mere timbres. Broadly speaking, therefore, the building blocks used to construct networks seem to get smaller (or, more precisely, shorter), culminating in Stockhausen's conception of moment form: 'now!'. Even total serialism is not the end-point of this trend of reduction; by isolating single notes, spectral composers thereafter were to deconstruct individual timbres.

Following on from the Darmstadt-modernist works, the perceptual unit 'grows': the blocks in *Requiem Canticles* have fully-formed melodic, rhythmic and harmonic characteristics, whilst *Black Angels* and *Voci* play upon the relationships between styles, which take events in those dimensions for granted. Interestingly, these three works all have some sort of extra-musical agenda: they have significance above and beyond the purely musical relationships they present. The notion that 'points' might be more or less temporally extended implies that certain networks might be understood to emphasise spatial characteristics, in this case, those composed in the middle of the twentieth century. Interesting though this may be, a thesis of selective case studies cannot stand as evidence of larger historical trends.

However, what these observations do provide is a basis for grouping the works under discussion, for drawing connections between them.

As well as being characterised in terms of size, perceptual units might also be considered in terms of their 'shape'. From this point of view, the list of case studies may be summarised as: *Jeux* – Waves; *Kontakte* – Moments; *Atmosphères* – Arches; *Requiem Canticles* – Blocks; *Black Angels* – Styles; *Voci* – Folksongs. Again, this suggests a certain grouping of the works. Arches can be considered as subordinate parts of waves, which implies some sort of perceptual relationship between the Debussy and the Ligeti; fundamentally these two works directly comment upon the passage of time. They are both process-based; smaller arcs give rise (and fall) to the same shape on a larger scale, just as the waves of *Jeux* contribute to the growth of its formal outline. Similarly, the exploration and fusion of two independent styles in *Voci* is also a linear process; by the end of the piece, folk- and art-music stand differently in relation to one another on account of an evolving line of connections between them.

In contrast, *Kontakte*, *Requiem Canticles*, and *Black Angels* seem to have a greater emphasis on spatial, rather than temporal, organisation. All three are based upon the separation of events – uncovering and juxtaposing different portions of musical space. Undoubtedly the most extreme example is the moment-form of *Kontakte*, in which separate 'nows' may or may not be connected. Importantly, in negating the normally functional roles of memory and expectation, Stockhausen's intention seems to have been the prevention of implication. Thus, by denying the listener any obvious means of constructing a network, *Kontakte* comments upon the whole notion of musical significance: while the work is not meaningless, the

connections between its events are not-necessarily-meaningful. In comparison, Stravinsky's dislocated blocks are positively connected, in that they uncover, bit by bit, an underlying network of spatial connections. Broadening things further, Crumb's juxtaposition of different stylistic referents has significance outside the work itself, asking listeners to situate its elements within their musical geographies.

All of this results in conclusions about the relationship between musical time and space itself. Although each of the works discussed seems to emphasise one over the other, both are contained within all of them. At the most basic level, all musical pieces are networks, organisations of sounds occurring in time; and in accordance with Stockhausen's deduction of the 'Unity of Musical Time', time and space are interrelated by the notion of perspective. To consider a span of time as a whole is effectively to take a temporal perspective, grouping events together as a spatial unit. It is interesting therefore, that the two most opposed twentieth-century works under consideration – *Atmosphères* with its extreme continuity and *Kontakte* with its extreme discontinuity – have equivalent implications for the perception of space and time. Despite their starkly contrasting treatments of time – one by-and-large fluid, the other fragmented – both lead to changes of intensity occurring in different spatial dimensions. Ultimately, therefore, notions of subdivision and (super)connection are fundamental to music as communication. This is what enables the assimilation of perceptions into memory, the transmutation of the present into the past, and attendant expectations for the future, or at least attendant conditions for understanding what subsequent events imply. There is always a balance between segmentation and synthesis; these networks can all be broken down, or equally, put together by listeners as well as composers.

Figures and grounds

One of the few common grounds between all of the works is the notion of 'ground' itself. Each one presents different relationships between temporal figures (the present) and grounds (the past/future); whatever spatial event is happening at a given instant is inevitably received within, and perceived in relation to, its surrounding temporal context. For each work that relationship is different, in accordance with their diverse musical surfaces; yet for all music, the 'figure' is in constant flux, as materials change over time.

The works diverge in their presentation of temporal grounds, however, with *Kontakte* and the *Symphony in G Minor* providing the outer limits of the range of music analysed here. Perhaps the most fundamental difference between them is that in the Mozart, there is a constant ground in relation to which all of the figures can be heard. Although its pitches are continually reorganised harmonically and tonally, all of the pitches belong to the chromatic scale. By contrast, the figures of *Kontakte* do not all conform to the same context, as some are unpitched and others are predominantly 'rhythmic' or timbral. Thus, the grounds against which Stockhausen's figures are heard continually shift, and that perpetual changing of dimension disrupts any sense of continuity – hence the *non*-linearity of moment-form.

In *Atmosphères* there is a similar shifting of grounds (the three points of maximum difference occur within different perceptual domains), although that process is far more controlled and far more significant. Since the ground shifts very gradually, culminating in *moments* of structural impact, listeners are more able to perceive those focal points as contributing to a network. The common ground

between the Ligeti and the Stockhausen is that in both, the shifting of ground predominates, albeit as a process that occurs at markedly different rates.

The other works surveyed here occupy positions between these extremes. The motivic activity of *Jeux*, for example, privileges figure over ground. Since that work involves varied repetition of the same few materials over time, changes of figure actually occur less frequently than those of *background* collection. As such, the importance of this work lies in its having forced listeners (and twentieth-century composers) to reappraise the correspondence between figure and ground. A further redefinition of this relationship occurs in *Requiem Canticles*. As a serial composition, its pitch array marks out a consistently divided ground – pitch space; and consequently, the formal blocks may be conceived as figures. However, through the ritual repetition in his work, Stravinsky reverses that distinction. As the same textural blocks recur time and again, *they* might be considered as forming the more-constant ground, such that the serially-derived shapes that they contain are projected in a figurative way. In addition to this, texture and timbre also play a part in Stravinsky's challenge to listeners' perception of the distinction between surface and background activity. The composer creates variety through the skilful deployment of different extents of timbral and textural change.

Moving from construction (Section 2) to situation (Section 3), the notion of figure and ground, although less literally manifest, might still be applied to issues of style. In the case of *Black Angels* the implied ground is one of musical geography, within which juxtaposed stylistic figures gain significance. With knowledge of the programme, qualified listeners are able to rationalise their experience of the piece, situating apparently random events within their own geographical network.

Throughout the thesis, each example has involved the assimilation of notionally 'smaller' units within 'larger' ones, be it an arc of intensity within an arch-form, a single formal unit within a block-form, or in this case, a single style within musical geography. Effectively, therefore, situation might be considered as an equivalent comparative process to that of construction, only it occurs at a higher level of perception. Thus *Voci* uncovers the common grounds between apparently contrasting stylistic figures. That concluding work converts a spatial separation into a temporal process of integration.

Whether or not there is integration (*Voci*) or disintegration (*Kontakte*), continuity (*Atmosphères*) or discontinuity (*Requiem Canticles*), horizontal motion (*Jeux*) or vertical stases (*Black Angels*), all networks gain significance through the playing out of oppositions. Ultimately, opposition and duality are inherent to any process of comparison, since grouping is a by-product of division and vice versa.

Thus, all pieces of music might be considered from at least two perspectives - one from which their elements are separate, and another, opposed one from which they are connected.

Perhaps the most important opposition in music as communication is between composers, who posit particular sounds in time and space, and listeners, who regroup them: *composition* and *reposition*. This very notion itself is one of interrelated perception - by perceiving one thing, listeners alter their perceptions of others. Thus, the experience of perception is continually repeated, although it is subject to constant modification - difference and sameness are effectively two sides of the same coin.

Discussion of some of the many ways of grouping the case studies shows that there are indeed points of connection between those listening experiences. It remains to address ways in which the thesis as a whole might be conceived as a network, and to consider those implications for music as communication: to reflect on the extent to which all of these diverse pieces might be related.

(Net)working conditions

The first of the five conditions for the existence of a network as set out in the Introduction states that each of its points – in this instance the case studies – should belong to the same domain. That is, there must be some sort of commonality amongst them, such that they might be regarded as inhabiting a conceptual space. The fundamental connection between all of the pieces, put simplistically, is that they are all music. Individually they offer distinctive – and iconic – organisations of musical time and space, each one calling for perceptual comparisons at different levels of perspective. Thus, collectively the case studies satisfy the second and third conditions for the existence of networks: each one occupies a position (or positions) within musical geography, as well as positing smaller-scale relationships between sounds; each one is a context for meaning, as well as a single whole. Of course, the differences in the perspectives from which they are meaningful make them fundamentally incomparable as a family of pieces. Nonetheless, as demonstrated above, they can be considered to have certain common grounds which operate across those perspectives: the relationships between figure and ground; those between construction and situation; the opposition between continuity and discontinuity; and the implications of all of these for the balance between segmentation and synthesis.

Communication really takes place as listeners negotiate their own 'routes' through a possible range of connections. The sheer variety of ways in which they might do so gives potential for multiple, and individual, interpretations, and that is what makes music so meaningful.

Before addressing the final two network conditions, it is worth making the point that, as well as time, these works also inhabit physical space. Notably, the two 'referential' works, *Black Angels* and *Voci*, both specify particular stage layouts. This is unsurprising, as they both present listeners with large perceptual units that they can take for granted; by inviting comparisons between styles, they comment on the manner in which the relationships between many sounds at a time might be understood. As such, the enhancement of the ensemble by way of stage layout is an extension of that invitation, to hear materials in a particular way – for *Black Angels*, as an explosion of the string quartet; for *Voci*, as three, separate levels of voices. Interestingly, the only other work in which the arrangement of physical space is specified is *Kontakte*, in which listeners can take nothing for granted due to its changeable and acousmatic nature. Effectively, this serves to connect up the two ends of the spectrum of perspective. Being able to take the implications of sounds as given is in some sense the equivalent of its opposite – knowing nothing of those implications – in that both these circumstances offer the same degree of certainty/uncertainty to the listener.

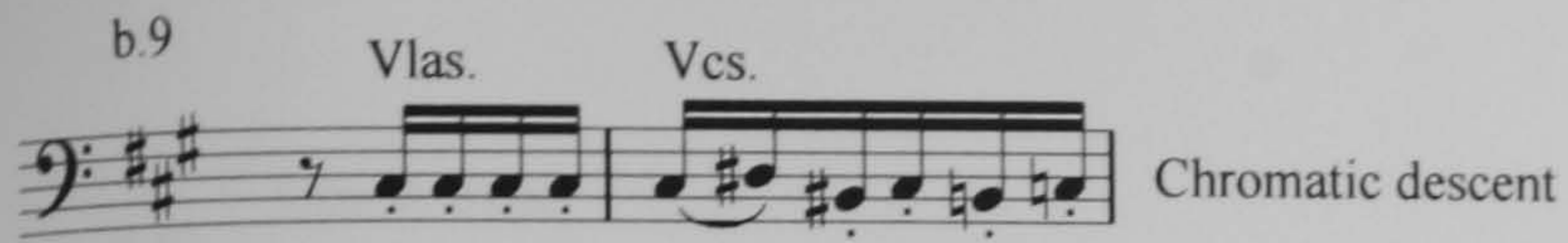
The fourth condition for networks specifies that a number of relationships must be in operation, rather than a single connection between two points. This is the case for every piece under consideration. It is surely no coincidence that the titles of all these works are plurals; these are networks of moments (*Kontakte*), timbral states

(*Atmosphères*), motifs (*Jeux*), blocks (*Requiem Canticles*) and styles (*Black Angels*). This only leaves *Voci*, which might seem to imply a single connection between folk- and art-music. Importantly, this is manifest through the integration of various aspects of both styles; the fusion occurs as the product of a number of ongoing relationships, rather than a single one. Thus, a single, large-scale connection (between the two styles) is expressed through a network of connections at lower levels. Similarly, the ubiquity of perceptual segmentation and synthesis in musical experience means that where there is opposition, there is potential for unity, and in realising that potential, listeners come to ‘understand’. Communication is taking place.

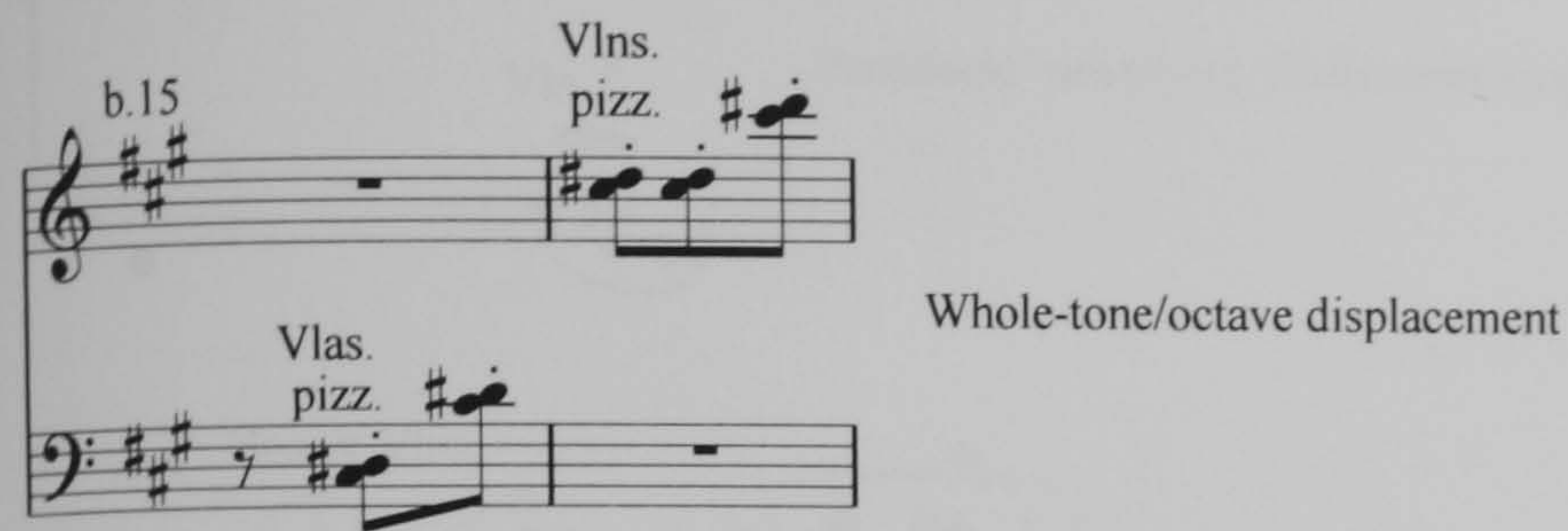
Finally, the fifth condition implies continuity – that networks are ‘extendable’ in time. Fundamentally, the case studies contained in this thesis are only selected examples chosen to represent networks occurring at particular perspectives. Ultimately, due to the extraordinary versatility of this concept, future research will enable the inclusion of countless interpretations of these and other pieces. As ‘networks self-organise, morphing and changing as they react to interference and breakdown’ (McCarthy, Miller and Skidmore 2004: 11), there is seemingly no limit to what this concept might contain. Its beauty and power lies in its flexibility. Since the aim of the thesis is to open up understanding, its strength lies in the ways that it promotes inclusion, such that it cannot result in conclusion.

Appendix: Motifs in *Jeux*

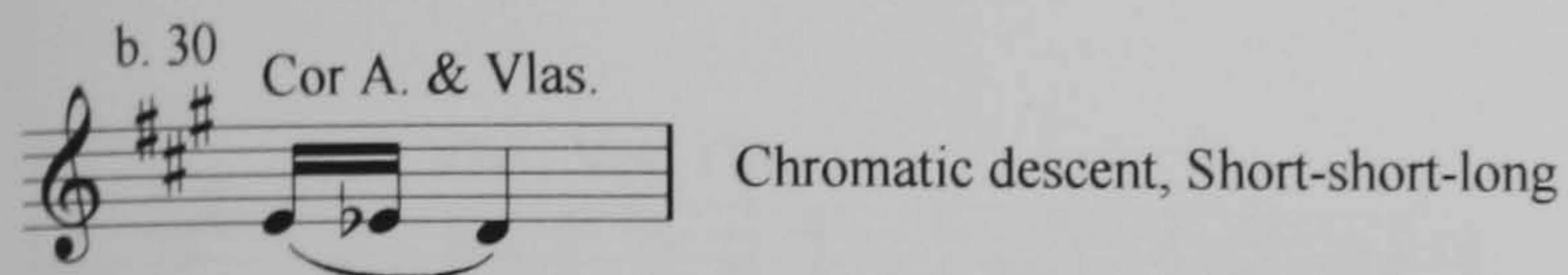
b.9 Vlas. Vcs. Chromatic descent



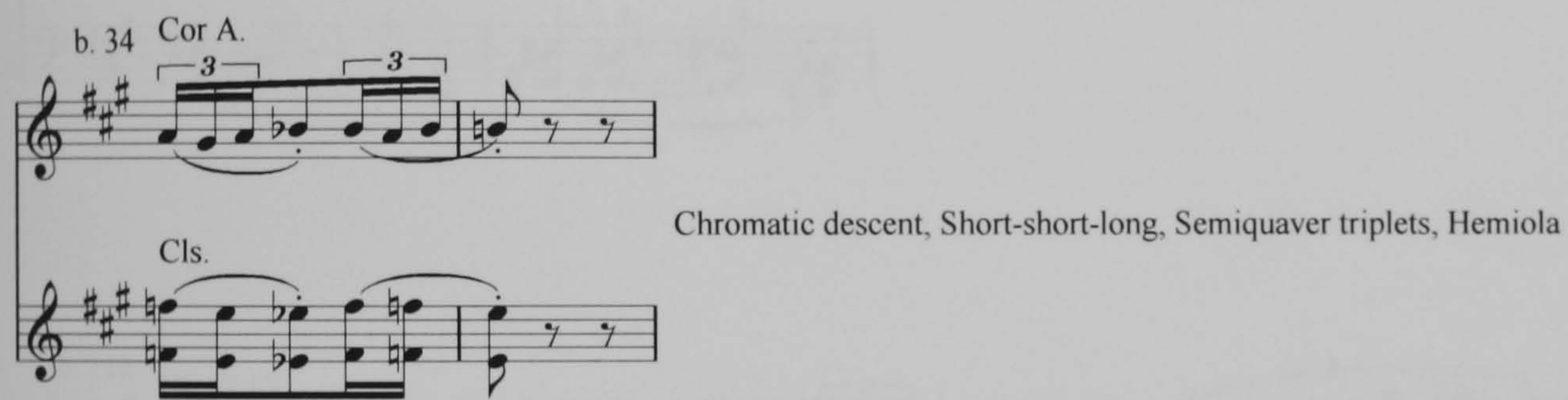
b.15 Vlns. pizz. Vlas. pizz. Whole-tone/octave displacement



b.30 Cor A. & Vlas. Chromatic descent, Short-short-long



b.34 Cor A. Cls. Chromatic descent, Short-short-long, Semiquaver triplets, Hemiola



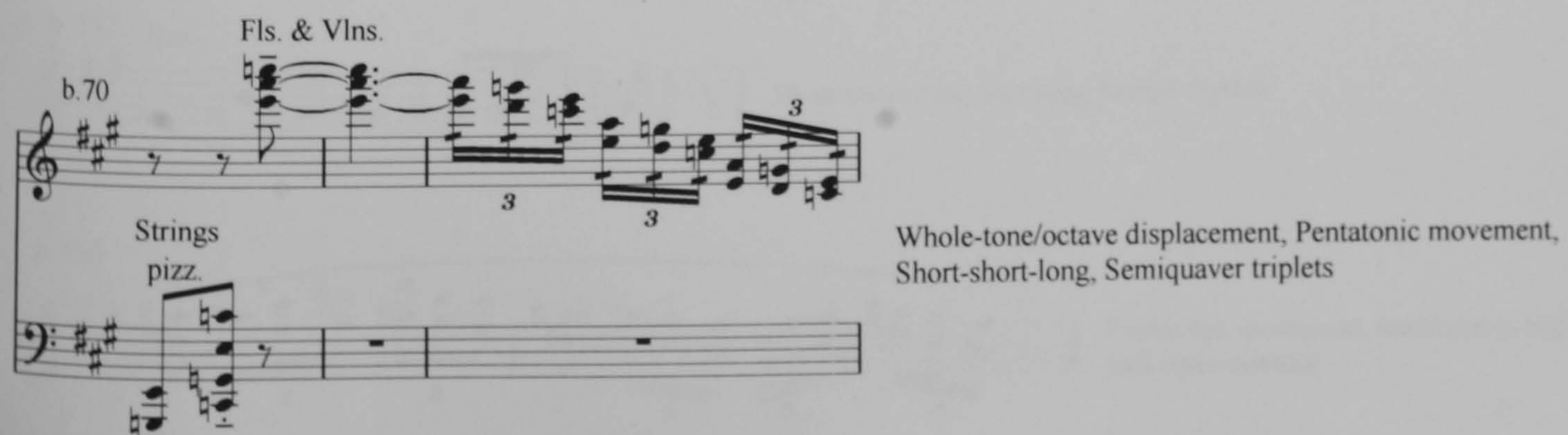
b.49 Cls. Short-short-long, Ramp



b.57 Cor A. Chromatic descent, Semiquaver triplets, Arc



b.70 Fls. & Vlns. Strings pizz. Whole-tone/octave displacement, Pentatonic movement, Short-short-long, Semiquaver triplets



b.74 Obs. & Bsns.

Vln. 2 Pentatonic movement, Short-short-long, Arc

Detailed description: This block shows two staves of music. The top staff is for woodwinds (Obs. & Bsns.) and the bottom staff is for Violin 2 (Vln. 2). The key signature has three sharps (F#, C#, G#). The woodwind part has a melodic line with a dotted rhythm. The violin part has a pentatonic scale-like movement with a short-short-long rhythmic pattern and an arc over the notes.

b.84 Hps. & Vlms.

Chromatic descent, Full wave contour

Detailed description: This block shows a single staff of music for harps and violins. The key signature has three sharps. The melody consists of a chromatic descent followed by a full wave contour.

b.110 Hns., Vlns., Vcs., Cbs.

Hemiola

Detailed description: This block shows three staves of music. The top staff is for horns (Hns.), the middle for violins (Vlns.), and the bottom for violas (Vcs.) and double basses (Cbs.). The key signature has three sharps. The music features a hemiola rhythm.

b. 118 Ob. & Cl.

Vlms.

Chromatic descent, Short-short-long, Semiquaver triplets, Full wave contour

Detailed description: This block shows two staves of music. The top staff is for oboes and clarinets (Ob. & Cl.) and the bottom staff is for violins (Vlms.). The key signature has three sharps. The woodwind part has a melodic line with a triplet of eighth notes. The violin part has a chromatic descent with semiquaver triplets and a full wave contour.

b.124 Fl.

Arc

Detailed description: This block shows a single staff of music for flute (Fl.). The key signature has three sharps. The melody features a five-note arc.

b.138 Tpts.

Pentatonic movement, Short-short-long

Detailed description: This block shows a single staff of music for trumpets (Tpts.). The key signature has three sharps. The melody features a pentatonic movement with a short-short-long rhythmic pattern.

b. 142 Bsn.

Short-short-long, Hemiola, Dotted rhythm

Detailed description: This block shows a single staff of music for bassoon (Bsn.). The key signature has three sharps. The melody features a short-short-long rhythmic pattern, a hemiola, and a dotted rhythm.

b. 150 Fls.

Pentatonic movement, Semiquaver triplets, Full wave contour

Detailed description: This block shows a single staff of music for flutes (Fls.). The key signature has three sharps. The melody features a pentatonic movement with semiquaver triplets and a full wave contour.

b. 153 Hns. Hemiola, Dotted rhythm



b. 172 Obs. & Cls. Short-short-long, Hemiola

Vlns.




b. 174 Fls. Chromatic descent, Dotted rhythm

Vln. 1



b. 178 (+ Vlns.) Hemiola, Dotted rhythm, Full wave contour

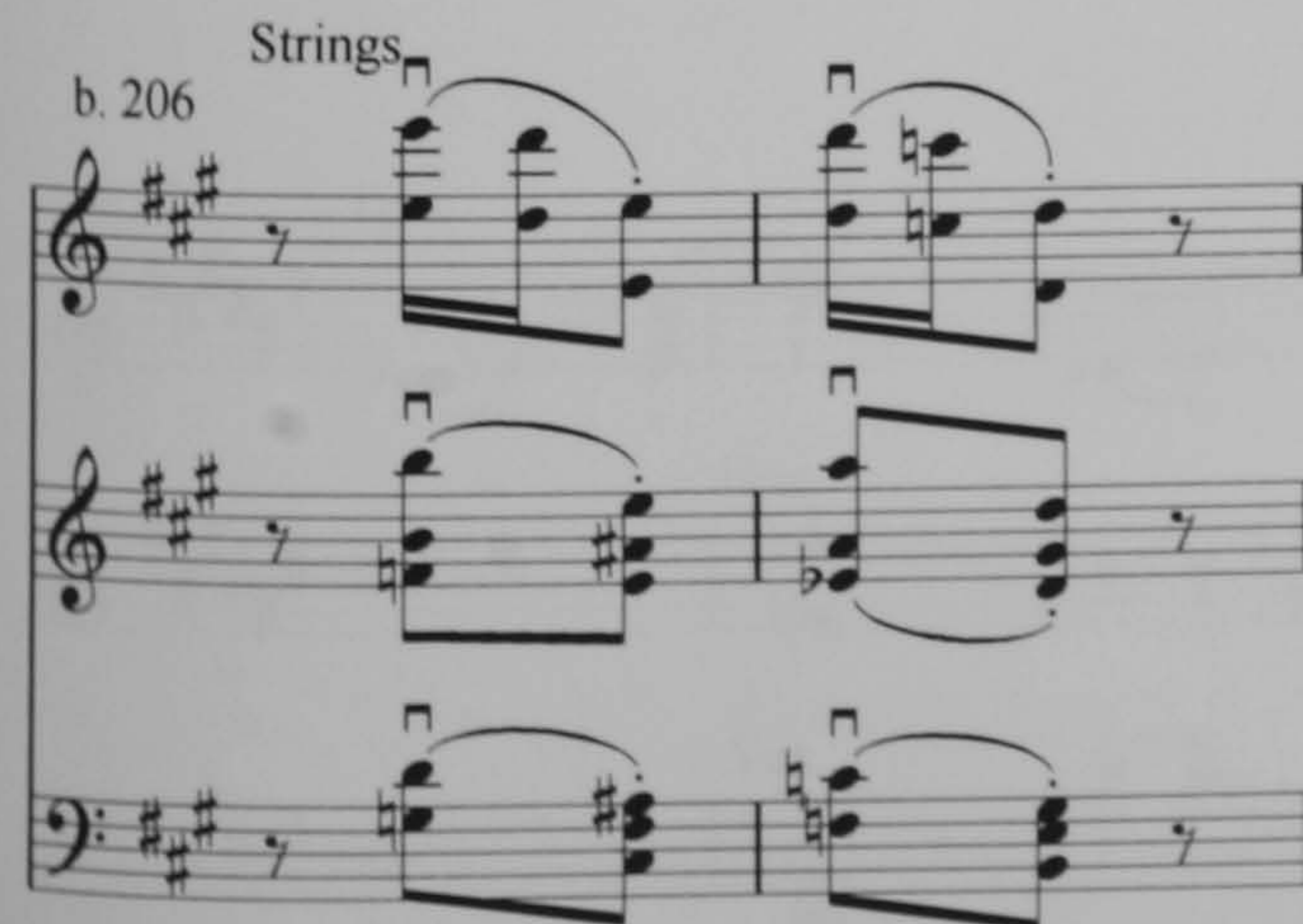
Vlas. Vcs.



b. 202 Fls. Strings Tpts. Whole-tone/octave displacement



b. 206 Strings Whole-tone/octave displacement, Hemiola



b. 217 Hns.

Whole-tone/octave displacement, Dotted rhythm, Full wave contour

b. 224 Strings

Chromatic descent, Descending-minor-third/ascending-semitone

b. 226 Vln. 1 (1 desk)

Hemiola, Full wave contour

Vc (1 desk)

b. 230 Hp.

Whole-tone/octave displacement, Pentatonic movement

b. 237 Vlns. I & Vlas

Dotted rhythm

b. 254 Tpts.

Whole-tone/octave displacement, Dotted rhythm

b. 264 Picc.
 (Fl.)
 Ob., Cor A.,
 Cl.
 (+Vln. I)

Chromatic descent, Hemiola, Full wave contour

b. 276
 Strings

Descending-minor-third/ascending-semitone,
Dotted rhythm, Short-short-long

b. 284 Hn.
 Picc.
 Vln. 1 pizz. (sim. (follows hn))
 Vln. 2 arco

Chromatic descent,
Whole tone/octave displacement
Short-short-long,
Semiquaver triplets

b. 309 3 Obs. & Cor A.

Full wave contour

b. 315 Bsns.

Dotted rhythm

b. 331
 Strings

Whole tone/octave displacement, Short-short-long,
Semiquaver triplets, Hemiola

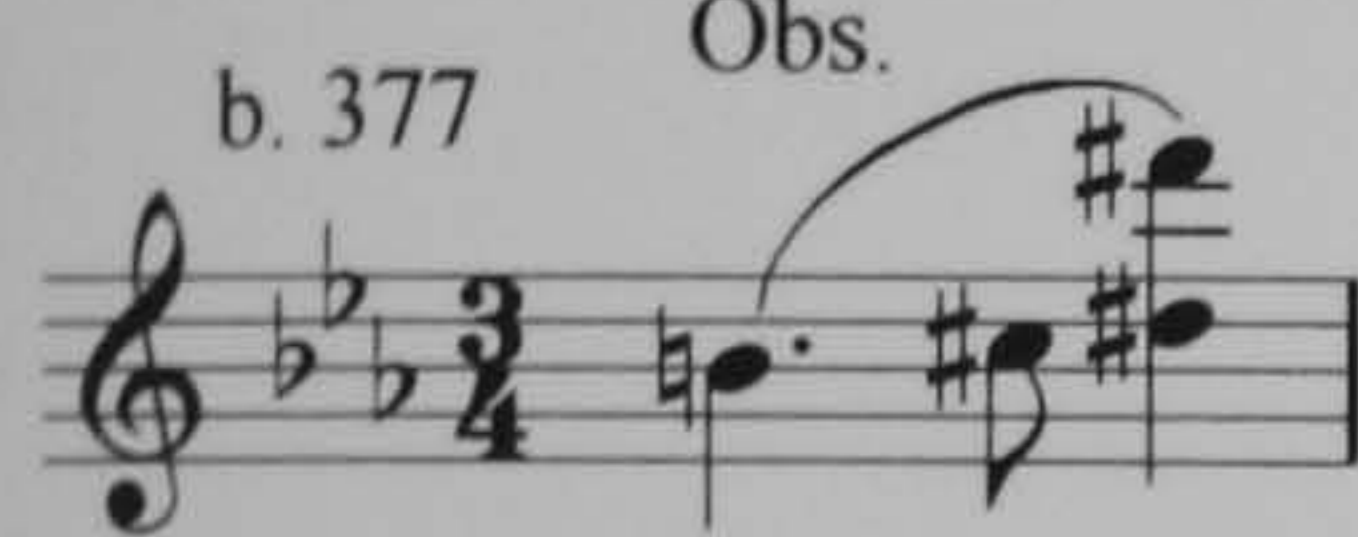
b. 335 Cl.

Full wave contour

b. 348 Cor A. 3
 Semiquaver triplets

b. 357 Obs. & Cls. 2 Fls. & Cor A. Cls. Fls. Cls. Hns.



Pentatonic movement, Short-short-long,
 Hemiola, Full wave contour

b. 377 Obs.
 Whole tone/octave displacement, Dotted rhythm

b. 379 Vlns.
 Chromatic descent

b. 403 Upper woodwind
 Descending minor-third/ascending-semitone
 Dotted rhythm, Full wave contour

b. 429 Vlns.
 Chromatic descent, Dotted rhythm

b. 435 Cls.
 Descending-minor-third/ascending-semitone, Dotted rhythm

b. 450 Ob. & Solo Vln.



Dotted rhythm, Full wave contour

b. 451 Cls.



Semiquaver triplets

b. 452 Vcs.



Semiquaver triplets, Hemiola, Full wave contour

b. 455 Cor A.



Short-short-long, Ramp


b. 473 B. Cl., Vcs., Cbs.



Dotted rhythm

Upper strings

b. 475



Chromatic descent, Whole-tone/octave displacement, Short-short-long

Lower strings

b. 483



Chromatic descent, Hemiola

b. 489 Cor A.



Chromatic descent, Hemiola

b. 503 Strings



Dotted rhythm

b. 527 Woodwind

Semiquaver triplet, Dotted rhythm, Arc

b. 535 B. Cl., Bsns. Hns.

Short-short-long, Hemiola, Dotted rhythm, Full wave contour

b. 565 Hn.

Dotted rhythm, Full wave contour

b. 593 Vlns. & Fl.

Chromatic descent, Whole tone/octave displacement, Hemiola

b. 607 Vlns.

Whole tone/octave displacement, Hemiola

b. 611 Vlns.

Pentatonic movement, Hemiola

b. 615 Vlns. & Tpts.

Pentatonic movement, Hemiola

b. 635 Vlns.

Descending-minor-third/ascending-semitone, Short-short-long, Hemiola, Dotted rhythm

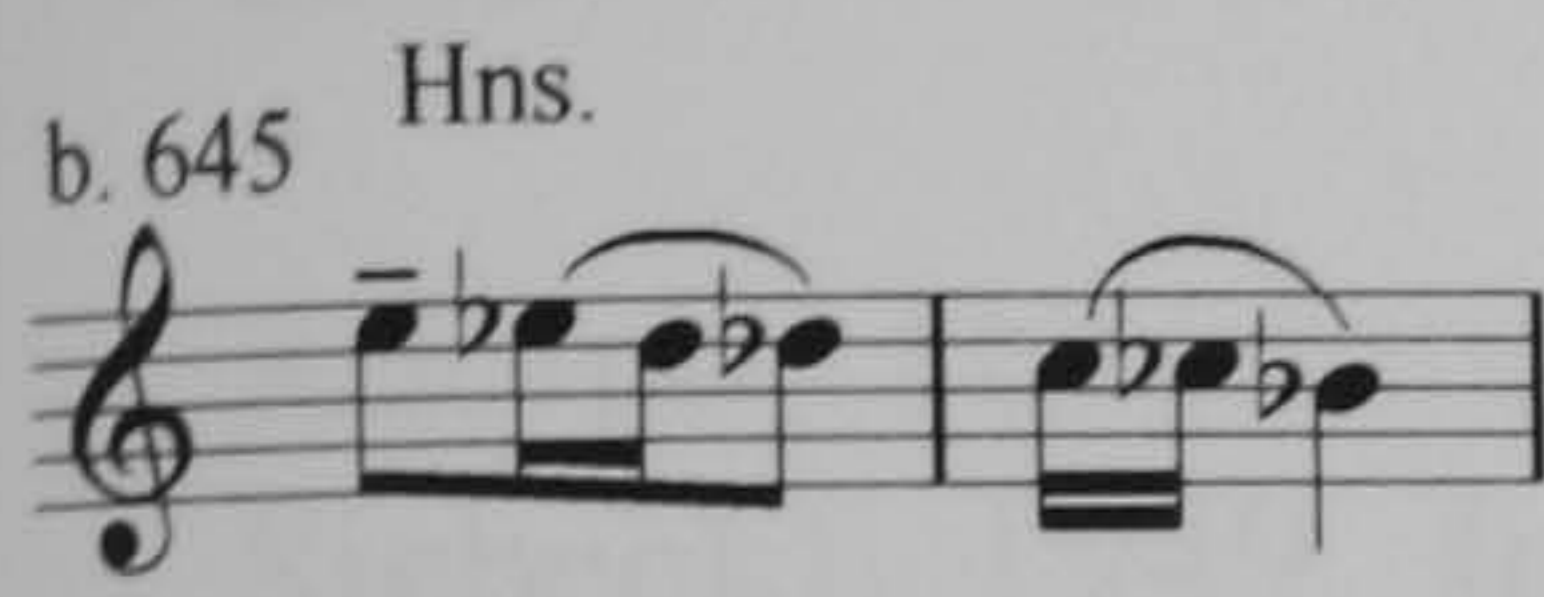
b. 639 Fl. & Ob.



Hemiola

Detailed description: This musical example shows a single staff in treble clef. It begins with a treble clef and a key signature of one flat. The notation consists of four measures. The first measure contains a quarter note G4, a quarter note A4, and a quarter note B4. The second measure contains a quarter note C5, a quarter note B4, and a quarter note A4. The third measure contains a quarter note G4, a quarter note F4, and a quarter note E4. The fourth measure contains a quarter rest, a quarter rest, and a quarter rest. A slur is placed over the first three measures. The label 'Hemiola' is placed to the right of the staff.

b. 645 Hns.



Chromatic descent, Short-short-long

Detailed description: This musical example shows a single staff in treble clef. It begins with a treble clef and a key signature of one flat. The notation consists of four measures. The first measure contains a quarter note G4, a quarter note F4, and a quarter note E4. The second measure contains a quarter note D4, a quarter note C4, and a quarter note B3. The third measure contains a quarter note A3, a quarter note G3, and a quarter note F3. The fourth measure contains a quarter note E3, a quarter note D3, and a quarter note C3. A slur is placed over the first three measures. The label 'Chromatic descent, Short-short-long' is placed to the right of the staff.

b. 677 Tutti



Dotted rhythm

Detailed description: This musical example shows a single staff in treble clef. It begins with a treble clef, a key signature of three sharps, and a 3/4 time signature. The notation consists of four measures. The first measure contains a quarter note G4, a quarter note A4, and a quarter note B4. The second measure contains a quarter note C5, a quarter note B4, and a quarter note A4. The third measure contains a quarter note G4, a quarter note F4, and a quarter note E4. The fourth measure contains a quarter note D4, a quarter note C4, and a quarter note B3. A slur is placed over the first three measures. The label 'Dotted rhythm' is placed to the right of the staff.

b. 684 Fls. & Vlins.



Short-short-long, Dotted rhythm

Detailed description: This musical example shows a single staff in treble clef. It begins with a treble clef, a key signature of three sharps, and a 3/4 time signature. The notation consists of four measures. The first measure contains a quarter note G4, a quarter note A4, and a quarter note B4. The second measure contains a quarter note C5, a quarter note B4, and a quarter note A4. The third measure contains a quarter note G4, a quarter note F4, and a quarter note E4. The fourth measure contains a quarter note D4, a quarter note C4, and a quarter note B3. A slur is placed over the first three measures. The label 'Short-short-long, Dotted rhythm' is placed to the right of the staff.

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