

**Poetry and Symmetry as
Organizing Forces in Music**

John Eccles

**A thesis submitted in partial fulfilment of the
requirements of Edinburgh Napier University,
for the award of Master of Philosophy**

Ian Tomlin Academy of Music

June 2012

Abstract

Aspects of poetry and symmetry are taken to represent the tension within the compositional process between spontaneous impulses and intuitive insights on the one hand, and more consciously imposed structure and organization on the other. These forces are not viewed as contradictory but as necessary and complementary elements of music; the need for balance between the two is considered essential.

Intuition plays a significant role in bringing together the disparate elements of the compositional process into a musical whole. Structure, both formal and otherwise, has a large part to play, but neither logical organization nor inspired themes will automatically create a satisfying piece of music. For the composer, accessing the intuitive sense can be aided by holding in mind a particular poem, picture or mood-tone as an overall organizing principle. Thus poetry, in its broadest sense, has guided the overall form of many of the compositions as well as providing initial stimuli.

For the purposes of analysis and discussion, this dissertation divides the pieces of the accompanying portfolio into three main groups in order to describe the particular role of poetical stimulus, symmetrical pitch organization and intuitive integrating forces. The final *Nocturne* is used to illustrate how all of these aspects are brought together in one piece.

Amongst the most influential composers on the author are Bartók, Lutosławski and Ligeti. Specific approaches to pitch organization used in the portfolio are drawn from their music, ideas and the theories of subsequent analysts. The music and writings of Schoenberg, Henze, Dutilleux, Copland and Rautavaara have also had a significant impact on the composer through their insights into the compositional process and the wider role of music in society.

Table of Contents

List of Tables	iv
List of Figures	iv
Acknowledgements	v
Introduction	vii
1 Background and Overview	1
1.1 General Influences	2
1.2 Symmetry in Music	6
1.3 Poetry and Visual Imagery	9
1.4 Integration	13
2 Poetry	16
2.1 The Use of Poetry in <i>Sick Leave</i> and <i>Sunlight</i>	17
2.2 The Music of <i>Sick Leave</i>	21
2.3 <i>The Sunlight on the Garden</i>	23
2.3.1 Poetic Influences	23
2.3.2 Tonal centres and large scale form	25
2.3.3 Local symmetries	26
2.3.4 Closure	31
3 Symmetry	33
3.1 <i>Horn Quintet</i>	33
3.1.1 Thematic material	34
3.1.2 Structure	35
3.1.3 Opening Fugue	36
3.1.4 Inner section: main horn theme / first variation	37
3.1.5 Inner section: second variation	38
3.1.6 Inner section: third variation	39
3.1.7 Coda	39
3.2 <i>Fragments</i>	39
3.2.1 Form	40
3.2.2 Musical Material	41
3.3 <i>Sextet</i>	42
4 Intuition	44
4.1 Intuition and Composition	45
4.2 Intuition and <i>Impromptu</i> and <i>Réverie</i>	48
4.3 <i>Impromptu</i>	52

4.4	<i>Rêverie</i>	55
4.5	<i>Impressions</i>	56
5	<i>Nocturne</i>	59
5.1	Poetic Influences	60
5.2	Pitch Material.....	60
5.3	Form	61
5.4	Opening Section – Andante Lontano	62
5.5	Bridge Passage – Moderato Inquieto	65
5.6	Central Section – Allegro Moderato	66
5.7	Final Section – Moderato Tranquillo.....	70
6	Conclusion	72
	References	76
	Bibliography.....	79
	Appendix I.....	80
	Appendix II.....	81

List of Tables

Table 2-1: Main sections of <i>Sick Leave</i>	17
Table 2-2: Main sections of <i>The Sunlight on the Garden</i>	18
Table 3-1: Main sections of the <i>Horn Quintet</i>	36
Table 5-1: Main sections of <i>Nocturne</i>	62

List of Figures

Figure 2-1: Twelve-note melody from <i>Sick Leave</i>	21
Figure 2-2: <i>Sick Leave</i> frameworks.....	22
Figure 2-3: Opening bars of <i>The Sunlight on the Garden</i>	27
Figure 2-4: Symmetric pitch sequence centred on F.....	27
Figure 2-5: Symmetric motif used to introduce the central section.....	29
Figure 2-6: Local melodic symmetries.....	30
Figure 3-1: Pitch material from the <i>Horn Quintet</i>	34
Figure 3-2: Twelve-note theme from <i>Fragments</i>	40
Figure 3-3: Tonal Centres in <i>Fragments</i>	41
Figure 3-4: Dorian cell and variations.....	42
Figure 3-5: Core pitch material for <i>Sextet</i>	42
Figure 4-1: <i>Impromptu</i> opening.....	53
Figure 4-2: Second theme from <i>Impromptu</i>	54
Figure 4-3: Theme from <i>Impromptu</i> central section.....	54
Figure 4-4: Clarinet solo opening <i>Rêverie</i>	56
Figure 4-5: Start of the second section of <i>Rêverie</i>	56
Figure 4-6: Pitch material for <i>Impressions</i>	58
Figure 5-1: <i>Nocturne</i> primary tetrachords.....	61
Figure 5-2: Main melody.....	61
Figure 5-3: Harmonic framework of first part of opening section.....	63
Figure 5-4: Partitioning of pitch classes between piano and strings.....	65
Figure 5-5: Main phrase of accumulation process.....	67
Figure 5-6: Pitch class coverage.....	68
Figure 5-7: Pitch and time spacing of accompaniment phrase entries.....	69
Figure 5-8: Harmonic framework of final section.....	71

Acknowledgements

I would like to thank above all my supervisors Ken Dempster and Steve Davismoon for all of their insights and encouragement throughout my studies. I would also like to thank all of the musicians who have rehearsed and performed the works of the portfolio and in particular members of the Edinburgh Quartet, The Research Ensemble and students at the Ian Tomlin Academy of Music at Edinburgh Napier University. Particular thanks also to Hannah Ross, Ailig Hunter, Ken Ross and Sharon Gormley and all of the staff within the school for their support and in creating a lively and stimulating musical environment.

I firmly believe that it is impossible to speak about music.

Daniel Barenboim

Introduction

This dissertation provides a background to the underlying ideas and influences of the compositions in the accompanying portfolio. All of the pieces attempt, in one way or another, to tackle problems of form and pitch organization and in particular draw upon ideas of symmetry, poetry and internal imagery as guiding forces within the music.

To some degree, poetry and symmetry are taken to represent the tension within the compositional process between spontaneous impulses and intuitive insights, and more consciously imposed structure and organization. These forces are not viewed as contradictory but as necessary and complementary elements of music; the need for balance between the two is considered essential. However, both symmetry and poetry have more than one meaning, and a precise association of poetry with intuitive process and symmetry with more logical ones is not intended. The term symmetry can describe a property which remains constant under transformation but also an aesthetic sense of proportion and consequent beauty. Both of these meanings are important to the music of the portfolio. Similarly, poetry can be used to refer to specific poems or to the more general idea of poetry itself, the shaping force behind a poem. The portfolio contains literal settings of poems but also pieces which have been shaped by the more abstract idea of poetry itself and more general internal imagery.

Despite the synergistic relationship between intuition and logic, or 'heart and brain' as Schoenberg was wont to call it, there is still a need for all of the components to be bound together in one musical whole, whatever their source. Clearly structure, both formal and otherwise, has a large part to play, but neither logical organization nor inspired themes will automatically create a satisfying piece of music. There is thus a need for an overall organizing principle that can draw disparate elements together. Ultimately, this is the composer's own aesthetic sense. However, in the drawn-out process of composition, something more specific - even if abstract and intangible - can be useful in honing the raw materials, integrating different parts and providing

overall musical consistency. For the composer, a poem, picture or mood-tone, has been used for this purpose in many of the compositions.

In all, there are nine compositions in the accompanying portfolio. These range from a piece for solo piano to one for chamber orchestra; details of each are given in the Appendix. Some pieces were written quite intuitively, others more deliberately set out to experiment with an idea or technique new to the composer.

The first chapter of this dissertation provides an overview of the composer's influences and an introduction to the roles that both symmetry and poetry play in the compositional process. In particular, some of the symmetrical constructs of Bartók, Ligeti and Lutosławski are described and, more generally, the views of Schoenberg, Copland, Henze and Dutilleux are discussed in the context of poetry, imagery and intuition as shaping forces in composition. Subsequent chapters give a more detailed analysis of the individual pieces to illustrate different aspects of these central ideas.

Chapter 2 describes settings of two poems, *Sick Leave* by Siegfried Sassoon and Louis MacNeice's *The Sunlight on the Garden*. The first is written for tenor and string quartet and uses twelve-note melody and local pitch symmetries. The longer *Sunlight* illustrates how the mood of the poem combined with a symmetrical structure of two opposing tonal centres guided both the overall form of the piece as well as phrase level details.

The *Horn Quintet* (for string quartet and horn) and *Fragments* (for string quartet alone) are described in Chapter 3. These two pieces extend the idea of two opposing tonal centres by using three and four centres symmetrically dividing the octave. The *Sextet* for strings and winds is also discussed.

Chapter 4 concentrates on the role of intuition and inner imagery in shaping a composition. This is illustrated through *Impromptu* (for solo piano), *Rêverie* (piano and clarinet) and *Impressions* (piano, violin and horn).

Chapter 5 describes the final piece of the portfolio, *Nocturne*, for chamber orchestra. This draws together in one piece the key ideas for the composer developed in earlier pieces; symmetrical pitch constructs at both large and local level; melody using all twelve tones; the integrating force of a poem, in

this case Neruda's *La barcarola termina*. The larger instrumental resources also allowed for the use of twelve-note pitch fields based on ideas derived from Bartók and Lutosławski

1 Background and Overview

The influences on the composer are many, ranging from detailed ideas to general concepts. Some have found expression only in a single piece of the portfolio; others underpin several works or have had a significant impact on the composer's overall development. This chapter summarizes the ideas and influences that are common to more than one of the pieces of the portfolio or have shaped the music in general. Specific influences on individual pieces are described as appropriate in the following chapters.

Amongst the most influential composers are Bartók, Lutosławski and Ligeti. Their music, ideas and subsequent analysis, particularly with regard to pitch organization and symmetry, have been used in many of the pieces within the portfolio. The key ideas are presented in Section 1.2; this summarizes musical symmetries, aspects of vertical organization, twelve-note chords and pitch complementarity.

Less obviously connected with any of the individual pieces of the portfolio, Schoenberg, Henze, Dutilleux, Copland and Rautavaara have nonetheless had a significant impact on the composer. Through both their music and writings, these composers have provided insight into the compositional process and the wider role of music in society. In particular, it is the way they have used poetry and literature to shape their own music that has given direct stimulus to the compositions of the portfolio. The general influences of these composers, along with others such as Shostakovich, are discussed in the Section 1.1.

Sections 1.3 and 1.4 go on to discuss in more detail the role of poetry and visual imagery in music, and how disparate elements of the compositional process, both logical and intuitive can be brought together in a musical whole.

1.1 General Influences

"I strongly believe and profess that every true art is produced through the influence of impressions we gather within ourselves from the outer world, of 'experiences'."

(Béla Bartók, 1909)¹

The composers and ideas described in this section are ones that have influenced the compositions of the portfolio by their effect on the composer, rather than by the use of any specific idea. Generally it might be said that their influences have been inspirational in the insight that they offer, and encouraging in the wish to explore and experiment with ideas new to the composer. Whilst a collection of names including Schoenberg, Henze, Dutilleux, Rautavaara and Shostakovich may seem initially diverse, they have much in common in their independent approach to composition. Bayer also groups Dutilleux with Ligeti and Lutosławski as 'intuitionists' for whom the result of composing is the essential aim, not the process itself (Dutilleux 2003, p104)².

Although Schoenberg is most widely known for his development of twelve-tone composition, it is his underlying approach to tackling problems of tonality and pitch organization that has provided the most insight to the author. For example, in reviewing the development of tonality and his own practices, he writes about Debussy: "Moods and pictures, though extra-musical, thus became constructive elements, incorporated in the musical functions; they produced a sort of emotional comprehensibility." (Schoenberg 1941, p216). In fact, comprehensibility is one of Schoenberg's essential themes; he was always keen to stress the complementary roles of 'heart and brain'³ and, although meticulous in the rigour and self-consistency of his compositions, he would not let theory override musicality (MacDonald 2008, pp134-147). As

¹ Quoted by Leafstedt 1999 (p56) from "Bartók to Márta Ziegler, February 4, 1909", Leafstedt gives original citation as: Somfai, *Béla Bartók: Composition, Concepts, and Autograph Sources*, 11".

² The original source (not consulted) in Dutilleux 2003 is given as: Francis Bayer, *Essai sur la notion d'espace sonore dans la musique contemporaine: De Schönberg à Cage*, Klincksieck, Paris, 1981,

³ See, for example, *Heart and Brain in Music* (Schoenberg 1946)

MacDonald points out "there is nothing in 'the method' that relieves the composer of responsibility for every note he or she writes ... in fact all composition proper ... is left, as before, to his own skill and judgement." (*ibid.*, p140). Although a twelve note series can provide unity within a composition, in the end it is the composer's skill and vision that must create the music (*ibid.*, p144).

This underlying philosophy of comprehensibility, and the need for intuition and logic to work together in creating a musical whole, has been a continuous background force on the composer. It helps to sift ideas, whether of intuition or logic, and to always keep the music end firmly on mind. As Ligeti says "it is precisely this tension between the rational, constructed element on the one hand, the visionary on the other, that plays such an important role in composing." (Ligeti 1983, p101).

Henze's relationship with dodecaphony and his use of poetry and literature has also been significant on the development of the composer's ideas. With regard to the most basic musical elements of pitch and interval, Henze wrote in 1959:

"The notes of the equal-tempered system, irrespective of the order in which they are conceived and the perspective in which they are viewed, offer themselves anew to the present as an unknown, uncharted field."
(Henze 1959, p90).

Henze believes that the properties of pitch, the tension of intervals, and their effect on the listener is fundamental: "However you try to alter and adapt it, the image of the interval of a 'fifth' or 'seventh' remains unchanged" (Henze 1959, p91). Henze goes on to assert that an interval can be viewed independently of traditional formalization without changing its essence. Fifty years later, this vitalizing approach to composition still resonates with the composer and lies at the heart of the compositions in the portfolio. The effect of a sequence of intervals on the listener, in the context in which they occur, is the end in itself. Structure and theory help to create the context and to shape the feel, but in the end the music must speak for itself. As Schoenberg commented "What good can it do to *tell* a listener, 'This music is beautiful', if he does not *feel* it." (Schoenberg 1937, p50).

In what Palmer-Füchsel calls a "lyrical, tonally orientated 12-note idiom", Henze often sets dodecaphony against triadic harmony (Palmer-Füchsel 2010) and polyphony against cantabile (Henze 1963b, p131). This kind of effect can be seen in the portfolio where several works move between chromatic and diatonic expression within a piece (for example, *The Sunlight on the Garden* and the *Horn Quintet*) and also in the variety of works, some more grounded in a traditional tonality (for example, *Impromptu* and *Rêverie*) than others.

Henze's works are strongly shaped by literature, poetry, dance and theatre. He sought a communicative style of music (Henze 1982, p45) and to "reproduce moods, atmospheres, states of being" (quoted in Schulz 2008, p7). Again, this is an idea which resonates with the composer for many of the portfolio compositions, particularly the more intuitive pieces such as *Impromptu* and *Rêverie*.

Dutilleux was also a composer strongly influenced by his love of literature and poetry. Perhaps the most important influence on the composer is the use of a poem, phrase or picture to provide the initial stimulus for a composition or to give an overall mood-tone, whilst still allowing the finished music to remain abstract (Dutilleux 2003, p36/71). A similar view on the purely musical nature of pieces shaped by inner visual imagery is also advocated by Ligeti and discussed further in Section 1.3. As with Henze, Dutilleux also sought a comprehensible and communicative language, yet one in which structure and logic is balanced by irregularity and surprise (*ibid.*, p103).

In the composition process Henze stresses the importance of a composer's inner world:

"It is the nature of every artist to create his own picture of things, to contrive his own world, without regard to the facts, the mores and fashions outside that world. It is only by ignoring or by transforming such circumstances into images that reach his imagination, by reversing, reinterpreting and renaming, that it becomes possible for him to respond to his environment."

(Henze 1963b, p132)

The role of the composer's inner world is also of great importance to Ligeti and Rautavaara. Ligeti's highly visual imagination is discussed further in

Section 1.3. For Rautavaara, the desire to create his own world was an essential element in him becoming a composer (Rautavaara 2008). Many of his works are also influenced by poetry and imagery and he cites both Baudelaire and Eliot amongst his influences (Rautavaara 2000, p4,6). Rautavaara also asserts the importance of problem solving and that, for him, composition is often more an act of discovery than creation, "not invented, but found" (*ibid.*, 8:33). In the same context, he also stresses that composition is an organic process and that music "grows according to its own laws". He urges his students to "listen to it and find out what it wants" (*ibid.*, 7:00). These have proved useful ideas to the composer and the idea of composition as discovery and problem solving, whilst not central to the work in the portfolio, has the ring of truth to it for the composer and has played a part in related work on computer aided composition (Davismoon & Eccles 2010).

In a different way, the influences of Shostakovich, long listened to by the composer, can also be heard in the portfolio. Although no conscious intent was present at the outset, there are stylistic similarities in some of the string quartet writing and perhaps in the shapes of some melodic phrases and the use of the octatonic scale. The use of flute and piccolo in *Nocturne* also owes something to the orchestration found in some of Shostakovich's symphonies.

In conclusion, as for any artist, the range of external influences on the composer is wide and varied. In the end, however, their real effect is felt by the way the ideas are assimilated and integrated within the composer. The deepest and most substantial music is achieved by a change on the composer rather than by the application of any particular technique or method.

"Music is not musicology, and the logic of a work rests on a unique constellation of incident, encounter, experience, agreement; it transcends inherited rules, construction, calculation."

(Henze 1960, p104).

1.2 Symmetry in Music

"In contrast to the traditional tonal system ... pitch relations in Bartók's music are primarily based on the principle of equal subdivision of the octave into the total complex of interval cycles. The fundamental concept underlying this equal-division system is that of symmetry."

(Antokoletz 1984, p xii)

Symmetry has two main meanings. Within the scientific community it is defined in terms of a property that is unchanged by transformation and has a precise, objective definition. This co-exists with another, more subjective, definition in which symmetry is considered to be an aesthetic property concerned with proportion, a "balanced arrangement and relation of parts" and the beauty resulting from it (The New Shorter Oxford English Dictionary, 1993).

Musically, both of these meanings have significance. The latter is perhaps the most familiar and relates directly to classical ideas of form epitomized by sonata form and the symphony. In these forms, it is the arrangement of the main musical sections, their proportions and their relationship to the tonic key that are considered as symmetric properties. This is the Classical view of symmetry found in art, literature and architecture. However, proportion and balance remain an essential concern for composers in all periods, even if the musical language used is vastly different from that of the Classical and Romantic times. With regard to "the perfection of the form" in the music of his time Bartók wrote:

"The force of content, hard to express in words; the freshness of -making use of Schoenberg's expression - the 'first inspiration'; the harmony of the voice-leading: these three factors yield the work of art. But did not these factors also exist in older works of music? The principal requisites definitely have not changed; the change is only in the use of the means: in the past one worked with more restrictions, nowadays with broader possibilities."

(Bartók 1920, p457).

In the view of the composer, this is still as true today as it was in 1920, despite further developments and even more possibilities. It also resonates with Henze's philosophy that the notes of the equal-tempered system "offer themselves anew to the present" quoted above.

The more objective forms of symmetry can also play a part in musical composition. Since the end of the nineteenth century, many composers have moved away from classical tonality and its hierarchical relationship of pitches with respect to a tonic key. As Bartók put it, "to avoid arrangement of the twelve tones according to certain scalar systems ... so that use could be made of the individual tones in any optional combination, horizontally as well as vertically, irretraceable to any scalar system." (Bartók 1920, p455). However, without the organizing force of the tonic-dominant relationship, new ways of organizing musical material were needed and ideas of symmetry played an important part of this process (Headlam 2008).

The way in which symmetries can be used to define relationships and priorities between pitches can be viewed, at least to some degree, as analogous to the hierarchies of tonality. Symmetrical structures can also be set against other non-symmetrical ones so that "symmetry is in a constant state of interruption and regeneration, tension and release, somewhat analogous to tonal stability and instability by motion away from and back to a tonic key." (Headlam 2010, section 4.i). Compositions can also be motivated fill in the gaps within symmetrical interval cycles (*ibid.*).

There are many musical properties which can, if desired, be arranged symmetrically within a composition, for example, pitch, rhythm, dynamics and tempi. The focus within this dissertation is on the symmetrical organization of pitch and tonal centres, ranging from small note groupings in a local context to the arrangement of tonal centres of an entire piece.

Symmetrical placement of tonal centres for different sections of a piece can be used to define the overall form of a piece. A remarkable example of this can be found in the first movement of Tchaikovsky's Fourth Symphony (Op. 36) composed in 1877-8. Although in an utterly Romantic idiom and, by and large, fitting the late Nineteenth Century pattern of sonata or 'first movement form', the three main subjects are introduced in the keys of F minor, A^b minor and B major respectively. The central development section starts in B minor and includes a prominent statement of the opening 'fate' theme, now transposed by a tritone from its initial F. The movement moves to its close in F via a restatement of the second subject in D minor (Brown 1982, pp 169-173). This

highly symmetrical structure anticipates many twentieth century works. One notable example is Bartók's *Music for Strings, Percussion and Celesta* which uses an intellectually rigorous but musically satisfying structure based on symmetric tonal centres. The opening movement is a fugue, but the successive voices enter in an alternating sequence of fifths opening out from the initial statement in A until the climax point at E^b is reached (A, E, D, B, G, F[#], C, C[#], F, G[#], B^b, D[#]/E^b). The process continues, with entries now in contrary motion, until they converge again to A at the close of the movement (Bartók 1937, p416). Whilst the pitch placement of the entries is strictly according to the tonal plan, Bartók uses *stretto* and fragmentary statements to pace and balance the work so that it feels organic rather than mechanical. The placement of the four constituent movements in A, C, F[#] and A gives an overall symmetry to the entire piece.

Many analysts of Bartók works draw on ideas of formal symmetry. These include Lendvai, Babbitt, Perle, Wilson and Antokoletz. Of particular relevance to the portfolio is Lendvai's 'axis-theory' which divides the 12 pitches of the chromatic scale into three symmetrical axis associated with the tonic, dominant and subdominant harmonic functions⁴. This idea is appealing from a compositional point of view because of its elegant symmetry (whether or not it accurately describes pitch organization in some of Bartók's own works) and plays a part in several works in the portfolio, notably the *Sextet*, *Horn Quintet* and *Fragments*.

Other symmetrical structures that play a part in the portfolio compositions include more local symmetries (i.e., the symmetrical effect extends only over a few bars or even a few notes), melodies using all twelve pitch-classes, and various forms of pitch complementarity. The latter is of particular relevance to the orchestral *Nocturne* which uses pitch fields comprising all twelve pitch-classes and is organized around a symmetrical set of three tetrachords. This is discussed in detail in Chapter 5.

⁴ For Lendvai's own description of his axis system see Lendvai 1971 pp. 1-16 and Lendvai 1999 pp. 11-16.

1.3 Poetry and Visual Imagery

"I came gradually to see that music and poetry were perhaps closer kin than I had at first realized. I came gradually to see that beyond the music of both arts there is an essence that joins them - an area where the meaning behind the notes and the meaning beyond the words spring from some common source."

(Copland 1952, p1)

The portfolio contains two settings of poems for voice. However, the influence of poetry extends beyond these pieces and affects the purely instrumental works. Even within literal settings, the poetic influence is more than that of the structural, rhythmic and melodic aspects which arise directly from the text. The mood, style and choice of expression are all shaped by the composer's own response to the poem. Such an approach echoes Schoenberg's sentiment, in talking about *Verklärte Nacht*, of wanting to "express the idea behind the poem" (Schoenberg 1946, p55). In fact, the effect of the poem on the composer can itself become the shaping force behind a composition; it creates a highly specific, personal, internal image which then seeks particular expression in musical language. Other external forms such as the visual arts can also create similar guiding imagery and these are discussed in the next section.

Rautavaara and Dutilleux are both composers who have used a poem, or even a poetic title or phrase, as part of the compositional process. Some examples of Rautavaara's uses have already been mentioned in Section 1.1. Dutilleux's use is perhaps more extensive. Many of his pieces bear an evocative title and individual movements are often also named (Dutilleux 2003, p70, pp136-138). The poem can sometimes be the initial impulse for a composition, but the effect can also permeate the whole compositional process and extend into performance. For example, with regard to his cello concerto, Dutilleux quotes lines from various poems at the start of each movement "as a way of indicating the general atmosphere of each" (*ibid.*, p71). The title, *Tout un monde lointain*, is itself taken from a line in Baudelaire's *La Chevelure*. Henze used a similar approach in *Ode to the Westwind*. This is a purely instrumental setting of Shelley's poem of the same name and Henze had it printed into the score "in order to show the player(s)

the intricate and multiple relations between my musical structure and the structure of the poetry" (Knussen 1996, p10).

Conversely, poetic phrases may arise once composition has started but then play an ongoing part. In the case of his string quartet, Dutilleux says "The subtitles over the seven sections ... came into my head as the work progressed... The music tends to follow these titles" (Dutilleux 2003, p76). The quartet's overall title, *Ainsi La Nuit*, was made up by Dutilleux himself, but only when the work was "practically finished" (*ibid.*).

It is interesting to note that nearly eighty years earlier Bartók had described the dodecaphonic composition process as more "poetic versification" than "architectonic-symmetrical" (Bartók 1920, p458). He was responding to "the fear that atonal compositions would present a shapeless mass" and stated that systems and methods are not essential: traditional techniques such as repetition and return to the starting point at the end were all still valid procedures. With a sentiment that is similar to Henze's regarding the fundamental nature of musical intervals, Bartók writes "the construction of the line born out of the different degrees of intensity that are inherent in the tonal succession would be completely satisfactory" (*ibid.*).

The portfolio contains three compositions directly shaped by poetry. Two, *Sick Leave* and *The Sunlight on the Garden*, are literal settings of poems. The selection and use of these poems is discussed in more detail in the next chapter. The third piece, *Nocturne*, is concerned with the more abstract use of poetry as a shaping force in music. It is a purely instrumental composition and draws together many of the ideas of symmetry and pitch organization that have been used in earlier pieces. In order to provide an underlying coherence and structure, the composer's response to Neruda's poem *La barcarola termina* (*The Watersong Ends*) was used. The use of a poem as an integrating force, in contrast to an initial stimulus, is discussed in the next section whilst details of the poem's specific use in *Nocturne* are given in Chapter 5 where the piece is analysed in full.

Visual imagery can play a similar role to poetry in the composition process. For example, Van Gogh's painting *La Nuit étoilée* had a great impact on Dutilleux and it was used as a "point of departure" for *Timbres, Espace*,

Mouvement (Dutilleux 2003, p72). Strong visual images lie behind many of Ligeti's works, both as a stimulus (Steinitz 2003, p142) and as part of his inner world. Ligeti himself says: "whenever I listen to music, I see colours and shapes" (Ligeti 1983, p102). A clear example is given in his description of *Lontano* where Ligeti comments: "I constantly have light-associations which really do play a part in the work" (*ibid.*, p92) and he goes on to say that for him the climax has an "irresistible association for me with the wonderful painting by Altdorfer, *The Battle of Alexander*, ... in which the clouds ... part and behind them is a beam of golden sunlight shining through" (*ibid.*, p93).

Three of the pieces in the portfolio have strong visual associations for the composer. It is perhaps no coincidence that these are also the most intuitively composed and draw the least on symmetrical structures or more logical forms. *Impromptu*, a piece for solo piano, was written in response to a request for music to accompany a film and is based on the composer's own images which arose from the director's description of light through the windows of an old house. The mood and feel of *Reverie* was also shaped by the composer's own internal imagery of Mediterranean light and landscape. These, along with the more abstract *Impressions*, are discussed in Chapter 4.

It should be noted that music arising from, and guided by, poetic and visual imagery is not necessarily programme music or even 'about' the original stimulus. The poetic processes are internal ones for the composer, not always to be directly revealed. For example, Dutilleux says: "for me, my pieces are abstract music even if the initial impulse has, in some cases, been given by a particular picture or poem." (Dutilleux 2003, p36) and Henze comments "despite its use of pre-existing forms and figures, my music is not susceptible of literary interpretation; it is direct" (Henze 1963a, p128).

However, the absence of a programme or 'meaning' does not mean that these inner processes do not strongly affect the resultant music or that the listener cannot sense their presence. It is simply that the effect is apprehended in musical terms. Ligeti is quite emphatic about this point, in the context of *Lontano* his says:

"But this does not signify that it is literary or illustrative music in the sense of programme music. If I say, for example, that Lontano is a work in which colours and space are very significant, these colours and this space exist only in the music. Lontano, distance, remoteness, as an aura of feeling that surrounds this music, is to be understood as a purely musical category."

(Ligeti 1983, p102)

More generally, Ligeti talks about the role of association and that, for example, the music of Debussy and Mahler "brings in its wake, as a comet in its train, a whole wide area of associations from every level of human experience" (*ibid.*) He goes on to say "In this way, music ... is truly bound for me with every stratum of imagination and of actual life. But everything is transposed into music!". Yet just as in poetry, the communication relies on ambiguity and half expressed meanings.

Thus it may be that music can arise from personal experience, be guided by poetic and visual imagery, and yet remain pure music. Free from an explicit programme or given interpretation, the listener is free to respond and form their own interpretations but, in some way, these may still contain some essence in common with the composer and other listeners. In the view of the composer this, in the end, is what is at the heart of musical communication; not a mapping of symbols from one medium to a musical one, but a direct expression of an inner personal world, informed by art and personal experience, communicated anew by the composer's own musical language.

1.4 Integration

Each of Bartók's quartets demonstrates the composer's preoccupation with problems of architecture, and the integration of the several movements of each work is achieved in different ways... No doubt many motivic manipulations which seem carefully calculated were brought about intuitively: the line between reason and intuition is never sharply defined, but the compact thematic logic cannot be denied."

(Stevens 1993, p173)

Head and heart, logic and intuition, all play an essential part in composition. The relationship is often dynamic; ideas in one domain give stimulus to another which, in turn, can reshape the original idea. Such interaction can continue throughout the composition process. Goehr summarises it elegantly:

"New styles appear and new styles are born, both of rigorous application of formal principles and of arbitrary strokes of fantasy and imagination. When one is lucky, these two coexist. A new ordering of heart and brain thus suggests itself. A piece of music is brought into being by a free act of the imagination. This single stroke, involving as it does the man, his beliefs and his memory, ensures something other than the result of choice. Take this irregular thing, and upon it make operations of one kind or another as elegantly as possible. This produces an order of brain following heart. But better still when the results of brainwork themselves become new gestures and new images for development. A group of notes is transformed by the brain and a new image fires the imagination... "

(Goehr 1998, p74)

Dutilleux's use of section titles in *Ainsi La Nuit* is an example already given above. Henze expresses a similar view when he says: "Like an architect, you make a floor plan and a foundation, which can then be changed as things happen" (Henze 2001, 17:58). He goes on to stress the importance of both: "The clearer your concept of the whole work, the whole piece, the easier it becomes to work out details ... And yet, unexpected new elements always emerge, often too beautiful, too graceful to throw away. ... they create a new dimension, a new aspect".

In order to produce a coherent composition, these two forces must find some kind of overall musical balance. A dominance of logic and formal symmetry can result in lifeless music. On the other hand, too many unrelated ideas or spontaneous impulses also lead to incoherent and, in the end, lifeless music. As Schoenberg puts it: "without organization music would be an amorphous

mass, as unintelligible as an essay without punctuation, or as disconnected as a conversation which leaps purposelessly from one subject to another" (Schoenberg 1967, p1). Lutosławski asserts the need for the "psychological balance of form" yet comments that to push theoretical considerations too far provides little practical benefit to a composer (Lutosławski 1962, p20).

This tension between logic and intuition can, to some degree, be self-balancing - so long as the composer is prepared to give up an idea in return for a greater musical outcome. For example, the conductor Markus Stenz says of Henze:

"If he has to decide between dogma and creativity, he always chooses creativity. Even in the early compositions ... which can be completely analysed, there's always a moment when he chooses a more beautiful melodic line or an orchestral colour, cheats a bit and interrupts or stretches the serial composition... These are exciting moments in music, when the emphasis is not on a construction, but on the senses and on the sounds heard."

(Henze 2001, 43:24)

Dutilleux also stresses that organization is an essential part of composing, and yet he searches for "a certain coherence, an equilibrium that does not deny fantasy, a kind of pleasure which could also be that of game-playing, of a taste for risks, which is also very important." (Dutilleux 2003, p103). In the same context he quotes Baudelaire: "What is not slightly deformed has an unfeeling appearance, from which it follows that irregularity, that's to say the unexpected, surprise and astonishment, are an essential part and the characteristic of beauty".

Many analysts find this balancing of formal design and organic growth exemplified by the works of Bartók. In the context of the Fifth String Quartet, Gillies says "Bartók's love of symmetry [is] tempered by his perpetual inclination towards variation ... the static tendency of symmetry is lessened by the flexible, unpredictable variations" (Gillies 1993, p228). Similarly, in his analysis of symmetrical formations in the quartets, Perle concludes that Bartók achieves an "overwhelming unity of design and intensity of expression of the musical effect" despite the many diverse elements within a composition (Perle 1955, p205). Symmetry alone is not sufficient.

It is advocated that holding some quintessential idea in mind, however intangible, can provide a musical integrating force. It is a personal thing, not directly susceptible to logical analysis, but can provide precise guidance to compositional decisions, influencing every detail of the composition so that a coherent whole emerges. Schoenberg urged his students: "In composing even the smallest exercises, the student should never fail to keep in mind a special character. A poem, a story, a play or a moving picture may provide the stimulus to express definite moods." (Schoenberg 1967, p95).

Holding an idea in mind also has similarities to Rautavaara's view of composition as discovery. Sometimes the music is already partly sensed, waiting to be discovered, but the composer's own internal image guides the search seeking the appropriate musical expression. As the composition starts to develop, the emerging music can in turn sharpen the idea itself. MacDonald describes this kind of process "Like a ship at night or an iceberg through the fog, its bulk looms into the mind the composer's mind." (MacDonald 2008, p135).

Specifically for the composer, the use of poetry and visual imagery has played an important part in the majority of the compositions of the portfolio. The poetry or image is used both as an initial impulse and a guiding, integrating force; it also provides a balance to any over-organizing tendencies when using more explicit structures arising from the use of formal symmetries.

2 Poetry

*"the earth compels, upon it sonnets and birds descend"*⁵

This chapter describes the two poem settings, *Sick Leave* (Sassoon 1999, p83) and *The Sunlight on the Garden* (MacNeice 2005, p25). For both of these pieces (and the orchestral *Nocturne* described in Chapter 5) it was not so much the detail of the words or any particular rhythm or metre which guided the choice of poem, but the overarching mood and feel conveyed by the poem in its entirety. This approach is in sympathy with Goehr's suggestion that it is sometimes useful to consider the appreciation of music as a fairly rough and ready top-down process:

"But aesthetic pleasure and consequently some meaning can be obtained from the semi-attentive reading of a complex poem. There what is actually called 'its music' is communicated, even when many of its specific allusions are missed. This suggests that music is sometimes more appropriately perceived grosso modo, from its passing flow towards its detail, rather than from its detail towards its totality".

(Goehr 1998, pp217-218)

For the composer, this similarity of approach to poetry and music is considered to be of significance; it is the inner idea which provides underlying coherence by guiding the overall compositional process rather than the poem's surface detail. The mood and feel thus shape all of the music within the piece, not just the settings of the words. For example, *Sick Leave* uses a twelve-tone row to suggest the dream-world of the poet, contrasting with other parts of the poem that describe waking reality. Such a holistic view is also suggested by Copland when he says "For me the important thing was not the quarter tones [of a Quartet by Alois Hába] but the sonorous image that was left with me" (Copland 1952, p13/23).

Both pieces also use various pitch and tonal symmetries. In *Sick Leave*, the symmetrical constructs are primarily used as a means of generating musical material, although the use of an A-E^b polarity gives local direction to some of the sections. *The Sunlight on the Garden* develops the tri-tone polarity idea as

⁵ From *The Sunlight on The Garden*, Louis MacNeice (1937).

an integral part of the musical structure and uses local symmetries to mirror the larger-scale form as a symbolic gesture to represent ideas contained within the poem. It is the more substantial piece of the two and is described in more detail.

2.1 The Use of Poetry in *Sick Leave* and *Sunlight*

Both of the works described in this chapter are literal settings of the respective poems. Although each piece uses occasional repetition of a word or phrase for dramatic or musical effect – discussed in more detail below – the form of the poem and its effect on the musical structure is not substantially changed; the words appear in the music almost exactly as in the poem. Each poem thus defines an essential aspect of the form, a skeleton around which the music is built. The objective aspects of the poem thus control the sequence of events, the subdivision of the piece and the overall narrative of the music.

In the case of *Sick Leave*, the short poem is divided into four sections of alternating mood and tempo as shown in Table 2-1 below.

Bar	Tempo	Description
1 – 22	<i>Slow and dreaming</i> (♩=60)	Instrumental introduction and setting of lines 1-2: <i>When I'm asleep, dreaming and lulled and warm...</i>
23 - 52	<i>Allegro agitato</i> (♩=120)	Instrumental bridge and setting of lines 3-5: <i>While the dim charging breakers of the storm...</i>
53-81	<i>Tempo 1</i>	Development of opening material, setting of lines 6-8: <i>They whisper to my heart; their thoughts are mine...</i>
82-136	<i>Allegro agitato</i> (♩=120)	Setting of lines 9-13: <i>In bitter safety I awake, unfriended...</i>

Table 2-1. Main sections of *Sick Leave*

This subdivision arises directly from the sentence structure. The first and third sentences describe the dream-world of the poet, the second, fourth and fifth (the last two consecutive lines are grouped together for structural purposes) are concerned with waking reality and war. These sections define the overall form of the piece as a simple alternating structure of contrasting slow-fast-slow-fast tempi, the mood and character of each section arising from the subject matter of each sentence. The music, particularly with regard to pitch

material and its relationship to the words and the meaning of the poem, is described in more detail in Section 2.2.

For the more substantial *Sunlight on the Garden*, a different approach was used in the subdivision, treating the verses differently to give variation and direction to the music. The poem comprises four verses of the same six-line structure. A simple strophic form was considered too repetitive and not able to support a piece of music of nearly ten minutes long. The subdivision of the poem was guided more by the meaning and sentiment of the words. This is a more subjective approach than the handling of *Sick Leave*, and involved highlighting particular themes of the poem more below its surface. In particular, the ideas of time passing and acceptance were considered to be the most important and at the heart of the musical journey. This resulted in a much less symmetrical division of the poem so that it could move towards a climax near the end of the third verse; a sudden stop after the *allegro brillante* setting the first four lines of verse 3 places special attention on the last two lines of the verse, "The Earth compels / We are dying, Egypt, dying", felt to be the emotional heart of the poem. The last verse, echoing the music of the opening, serves a coda-like function to bring the piece to a conclusion. This is summarized in Table 2-2 below with a detailed description of the musical materials in Section 2.3.

Bar	Tempo	Description
1 - 9	<i>Andante sostenuto</i> (♩=69)	Introduction
10 - 37	<i>Più mosso</i> (♩=88)	Setting of verse 1: <i>The sunlight on the garden...</i>
38 - 41	<i>Tempo 1</i>	Recap of introduction bridging to second verse
42 - 66	<i>Più mosso</i>	Verse 2, musically very similar to verse 1 <i>Our freedom as free lances...</i>
67 -137	<i>Allegro brillante</i> (♩=136)	Setting of verse 3, lines 1-4: <i>The sky was good for flying...</i>
138 - 171	<i>Andante tranquillo</i> (♩=72)	Setting of verse 3, lines 5-6: <i>The earth compels, We are dying, Egypt, dying</i>
172 -136	<i>Più mosso</i> (♩=80)	Setting of verse 4, coda-like function: <i>And not expecting pardon...</i>

Table 2-2. Main sections of *The Sunlight on the Garden*

Within these structures, at a more local level, the individual words and capabilities of a human singer bring another set of influences to bear on the music. All notes must be in range for the chosen singer and set in a way that can be suitably articulated. Such constraints can add musically to the piece, however, not limit it. Arranging climax points to use the highest parts of the vocal range, for example the tenor's high B^b at the very end of *Sick Leave*, gives a sense of direction and tension fitting the meaning of the words (*through our blood*) whilst using the voice in its lower to mid range (e.g., *Sick Leave* bars 94-104) gives both musical contrast and avoids tiring the voice. Although these technical constraints generally come into play at the more local level, the effects can be felt over a longer range; starting a section at a particular pitch so that a climax point of the singer's part reaches a note at the extreme point of their register but not beyond it, for example. Such influences may even reach back to the very start of the piece, thus local detail and the whole are intertwined. This is illustrated in *Sick Leave* by the choice of A as the central tonality for the tenor, allowing the top A - B^b - A to be reached at the very end climax of the piece and approached from a low E at the start of the final section.

Within *Sunlight*, the phrase "The earth compels" is used at the very start of the piece (bars 6-8) and repeated three times in the central slow section (bars 153-158). The same section also repeats the words *Egypt dying* (bars 163-170). In both cases, the decision to make the repeat was for dramatic effect, emphasising the words considered to be at the heart of the poem's meaning. A similar dramatic effect was used at the very end of *Sick Leave* by repeating the final words of the poem, *through our blood*. This also at the high end of the singer's range combines to give a tense and stressed feeling appropriate to the mood of the entire poem and balancing its calm and dreamlike opening.

The lines in the third verse of *Sunlight*, "The sky was good for flying / Defying the church bells", and "And every evil iron / Siren and what it tells" are also repeated in the central *Allegro* (bars 91-112 and 117-132). This is more for musical reasons; the music is rapid and to keep a balance with the longer slower sections, an element of elongation was considered necessary. This need arose from the larger scale decision to split the setting of the poem in

this particular way (described below), but was considered an appropriate balancing of requirements given the larger aesthetic weight given to applying slower, more reflective music to the lines final lines of the third verse.

Although the direct effect of the words is an important part of the composition, both at the local and structural levels, the most significant effect of the poem is its mood and what it attempts to say through - and between - the words. This affects the music at all levels, from the choice of keys and tempo, to the musical phrases and gestures and local harmonies. The music becomes an attempt to re-communicate the poem in musical language, not simply the setting of words to a melody with a musical accompaniment. As Berkley says "Music does not speak to the intellect alone. Its most important contact with the listener is of another order for it belongs first and foremost to the spiritual worlds and the best music is that which communicates the most strongly on that level"⁶. This goal then helps the composer make decisions which are not fully constrained by the words and ensemble capabilities. Here the personal response of the composer must be taken into account. Why choose one note over another, a duration or pitch?

These become very subjective decisions and in the end can only reflect the composer's own aesthetics and personal response to the poem. Although intangible and subjective, they nonetheless can still provide coherence and consistency to the composition. In *Sick Leave*, a 12-note theme was used to represent the dream-like parts of the poem, however, for practical purposes the more chromatic parts were assigned to strings and more diatonic parts given to the voice. Furthermore, the opening statement was given to the 'cello, mindful of the poem's war subject and the fact that the first performance was to be in a cathedral, in order to give an elegiac quality to the music. For the composer, a balance had been found between the words, the sentiment of the poem, and the technical constraints of the ensemble. A similar approach, although with different results, was also taken in *The Sunlight on the Garden*. The personal reading of the poem leading to the aggressive piano gesture at

⁶ Quoted in Dickinson 2003, p100. Originally from R. Nichols, BBC radio 3 interview talk: Sir Lennox Berkeley Memorial Concert, Aldeburgh Festival 21 June 1990

the very opening answered by the gentler 'cello phrase, the symbolic representation of tension with chromatic notes and opposing key centres, and the shift from chromaticism to diatonicism representing growing acceptance and integration. This also reflects aspects of intuition discussed in more detail in Chapter 4 and helps to explain why the later *Nocturne*, although based on a poem, did not set the words or use them directly.

2.2 The Music of *Sick Leave*

Sick Leave is a setting of the poem by Siegfried Sassoon for tenor and string quartet. The poem is a truncated sonnet and, as described above, falls naturally into four sections; two connected with the dream-world of the poet and two with the waking reality and war. These sections define the overall form of the piece as a simple alternating structure of contrasting slow-fast-slow-fast tempi.

Overall, the piece is centred on A minor, which fits both the range of the tenor and fits the composer's own aesthetic regarding keys and subject material. The twelve-note melody (Fig. 2-1), which both serves as an introduction (bars 1-4) and announces the return to the ghost-inhabited dreams of the poet (bars 53-56), also outlines an A centred tonality. This is achieved through the prominence of the opening E and D and the subsequent return to A (bars 5 and 57). The final B^b of the melody acts as a kind of leading note, naturally falling to A. This gesture is used at several points including the final cadence. The tonality of the melody is still ambiguous, however, and the A-E^b axis can be glimpsed in the symmetrically placed D[#] and final G, F[#], B^b.

Slow and dreaming (♩=60)

'Cello

pp cantabile

etc...

Figure 2-1. Twelve-note melody from *Sick Leave*

In both of the slow sections, the music moves between A and E^b/D[#] to suggest a dream state, free to move, unanchored. The underlying framework, for both the harmonies and melodies, is generated by a sequence of pairs of fifths expanding outwards, the upper pair rising by major seconds, the lower

pair falling by minor thirds (Fig. 2-2a). The use of the framework, notably by the instrumental introduction (bars 5-16) and opening vocals (bars 17-22), is not strict. In particular, two different transpositions are used for the second pair of falling fifths and the interval of a fifth is in places opened out to a sixth. The open fifths of the framework also shape some of the melodies, for example, Violin I at bars 9-10 and the distorted fanfare in bars 11-12 and 76-78. At the end of the first slow section, the sequence of fifths is extended by one step to reach down to C for the start of the *Allegro agitato*.

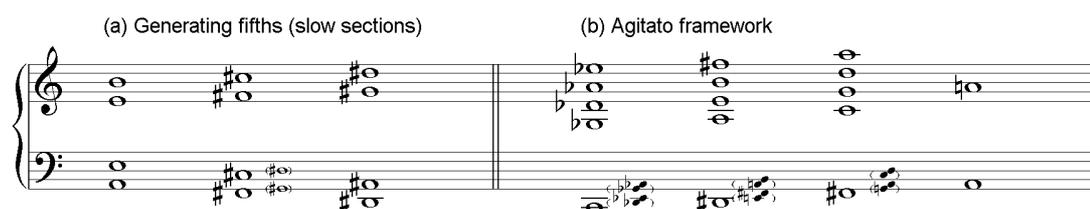


Figure 2-2. Sick Leave frameworks

The faster sections are characterized by a continuous semiquaver figure, centred on a single pitch but picking out various colour notes derived from a cycle of fifths starting an augmented fourth above the main pitch (Fig 2-2b). The first of the faster sections returns to A for the vocal entry (bar 40) by a sequence ascending in minor thirds from the C at the start of the section (bar 23). This intervallic structure is reminiscent of some of Lendvai's ideas on the equal division of the octave and is explored further in Chapter 3. A different approach to the closing A, characterized by semitones and fourths⁷, is used for the final section. This moves from the E^b close of the second slow section to E (bar 82) then through F, B^b, B and E again for the final approach to the closing A.

⁷ This sequence of F-B^b-B[♯]-E is the Z cell discussed in Chapter 5.

2.3 *The Sunlight on the Garden*

The Sunlight on the Garden is a setting of the poem by Louis MacNeice (MacNeice 2005, p25). The piece was composed for a competition marking the centenary of the birth of the poet Louis MacNeice⁸, the specific poem selected by the composer from a shortlist prescribed by the competition.

2.3.1 Poetic Influences

This piece develops some of the symmetrical ideas used in *Sick Leave* and makes them more of an integral part of the form. The top-level structure uses a symmetrical arrangement of tonal centres for the principal sections to reflect the opposing moods of the poem; the outer sections are centred in F whilst the main inner section is in B. The use of two centres a tritone apart is directly inspired by the works of Bartók (*Bluebeard's Castle* in particular). The piece also uses various local symmetries around the F-B axis, mirroring at the smaller level the larger form and providing an element of structural coherence.

Together, these ideas exert a strong influence throughout the piece. It is also an example of the organising force of poetry experienced by the composer. Such a force gives structure and deeper level of meaning to the composition's surface succession of notes and intervals. Whether or not the local symmetries mirroring the larger form, or indeed, even the F-B axis of the entire piece, are perceived directly by the listener is perhaps not of primary significance; it is the composer's own process of creating a dramatic musical structure, solving the musical problems, pleasing his own aesthetic, which gives rise to the music. This in turn is communicated to the listener, perhaps quite unconsciously, as a sense of coherence and depth

The setting of a poem to music has, of course, a very obvious manifestation in the detail of the notes, rhythms and sequence of events. However, the starting point of the composition was to identify, at least for the composer, the heart of the poem and a feel for what is trying to be expressed.

⁸ The competition was organized by the Scottish Centre for the Book, Edinburgh Napier University and the Scottish Poetry Library in 2007. The piece won first prize.

The themes of love and loss, life and death and the inevitable passing of time are clear. Beyond these, however, the underlying theme is seen as one of acceptance and the integration of seemingly contradictory aspects of life into a greater whole. The composition thus seeks to express these opposites, particularly restlessness and calm, light and dark, and integrate them within the music.

In a very intuitive way the phrase "the earth compels" seems to express the heart of the poem and, on its second occurrence, drives toward the dramatic climax of the poem in the line "we are dying". This interpretation was used to shape the musical structure, defining an emotional template for the piece.

The four verses of the poem are not treated the same; the first two are used to establish the initial mood of restlessness; the third, containing the climactic material, is musically extended and introduces two contrasting moods and new musical material; the final verse is used to review and integrate all that has gone before.

Stylistic effects also arise from the mood of the poem. For example, the continuous stream of semi-quavers accompanying the first two verses (Fig. 2-6a) are used to suggest the unstoppable flow of time. In particular, it was the desire to express the ideas of personal loss and acceptance, of fragmentation and integration, that gave rise to the idea of using the opposing tonal centres of F and B and of contrasting chromatic and diatonic musical language. The chromaticism is used as a fragmenting force, attempting to destabilise established tonal centres and opposing the integrating forces. However, the chromaticism is not specifically associated with the F centre, nor diatonicism with B, the underlying idea is to build a framework of opposites in which the music is continually trying to find the B in the F and the F in the B. This is perhaps another poetic force acting on the composition, the idea of the beginning containing the end which is one of the underlying themes in Eliot's *Four Quartets*⁹.

⁹ Stated explicitly in the first line of *East Coker* in *Four Quartets*: "In my beginning is my end." (Eliot 1959, p.21). A detailed description of themes may be found in Drew pp. 173-239.

2.3.2 Tonal centres and large scale form

Given the poem has been used to establish the overall shape of the composition in terms of mood and dramatic, the decision to use certain key centres and assign symbolic meanings to them is both more practical and more abstract. The opening F tonality was decided primarily by pianistic considerations; the chord shapes and rhythmic gestures fitting comfortably under the pianist's hands. The choice to then locate the calmer central section (*Andante tranquillo*, bars 138-164) in B was to provide the musical opposite to F so that the opposing tonal centres reflect the poem's contrasting moods; the agitation of the opening verses with the feelings of calm acceptance which subsequently emerge. The return to F for the close of the piece gives a cyclical structure and fulfils the symmetry.

As well as its symbolic role, the opposing F-B centres also provide a structure and harmonic direction for the music. This dual usage echoes Bartók's use of the F[#]-C tritone relationship in *Bluebeard's Castle* to not only provide the top-level structure of the opera where the tonality of the musical narrative parallels the dramatic narrative, but also represent the opposites of darkness and light, of Bluebeard and Judith (Leafstedt 1999, p58)¹⁰. Similar structural roles of the tri-tone can also be seen in other instrumental works by Bartók such as the first movement of *Music for string instruments, percussion and celesta*.

Within the overall F-B-F structure, the *allegro brillante* (bars 67-137) is seen as a transitional section and provides musical contrast to the main material, particularly in terms of the increased tempo. The F[#] centre of the section could be considered tonally as a simple dominant approach to the B of the central section but it might also be seen as part of the locally symmetric pitch sequence described in Section 2.3.3 below.

Around the chosen tonal centres, the music moves generally from chromatic harmonies and melody in the opening to a more diatonic, almost pentatonic,

¹⁰ Leafstedt provides a very detailed analysis of the role of tonal centres throughout the opera. In particular pp. 55-61 give an analysis of the F[#]-C symbolism and its high level structural role in the opera.

style for the main inner section. This follows the poem's move from restlessness to calm. In a deliberate breaking of the symmetry, however, the diatonic language is retained in the closing section symbolizing the integration of opposites. The overall form is thus cyclical and symmetric in terms of key centre and tempo but more linear in terms of style.

2.3.3 Local symmetries

The composition's top-level structure in turn gives rise to smaller levels of detail and structure. Whilst the finer details may not always be immediately apparent to the listener, the idea of local detail mirroring the larger form is itself an organising force which guides the composer's choices and decisions, giving rise to an recognizable feel and sound integrity which may be directly perceived by the listener.

The opening chromaticism allows for smaller scale symmetries to be injected into the music at a very early stage. The first bar, although firmly rooted in F by the piano bass note, introduces a G^b on the second beat and, on the fourth beat, the E/F[#]/B define a B chord symmetrically placed around the F centre (Fig. 2-3).

Andante sostenuto (♩=69)

The musical score consists of five staves. The top three staves are for Flute, Clarinet in B \flat , and Horn in F. The bottom two staves are for Violoncello and Piano. The tempo is marked 'Andante sostenuto' with a quarter note equal to 69 beats per minute. The key signature has three flats, and the time signature is 4/4. The Flute, Clarinet, and Horn parts enter in the second bar with a melody starting on B \flat . The Violoncello and Piano parts enter in the first bar with a chordal accompaniment starting on F. Dynamics include *ff* and *mf*.

Figure 2-3. Opening bars of *The Sunlight on the Garden*

This 'splitting' of the opening tonal centre is the start of a process which generates a simple sequence of pitches growing symmetrically outward from F (Fig. 2-4a). The process continues in bars 3-9 as the piano bass moves first through G \flat and E and then extends outwards to G and E \flat . A similar, although slightly more free process, can be seen in bars 7-9 where the flute and clarinet push outwards to A and D \flat respectively whilst the horn and 'cello move to F \sharp and E \natural . The reciprocal effect may also be glimpsed in the wind phrase in bar 2 (Fig. 2-3), answering the opening piano gesture, particularly in the flute part as it pushes back from the B towards F via the B \flat , A, G \flat and E.

Figure 2-4 consists of two musical examples, (a) and (b), on a single staff. Example (a) shows a sequence of pitches: F, G \flat , A, B \flat , C, D \flat , E, F. Example (b) shows a sequence of pitches: F, F \sharp , G, A, B, C, D, E, F.

Figure 2-4. Symmetric pitch sequence centred on F.

This 'splitting' sequence occurs at a number of points throughout the composition, particularly in the accompaniment to the first two verses¹¹. In some cases it is used exactly, but more generally as a shaping force. In fact, it could be equally suggested that the chosen symmetrical pitches create the opening chromaticism; the sequence suggests a hierarchy of notes which are chosen over others to colour the initial F centre. The presence of the G^b brings something of a Neapolitan flavour to some of the progressions and melodies and, combined with the E^b, forms both a kind of Italian sixth (with respect to F) and a dominant seventh (with respect to B). Although not used directly in a functional harmonic sense, these effects are exploited to anchor the tonal centre or generate harmonic direction.

The sequence of Fig. 2-4a, by the nature of its own symmetry around F, inevitably points towards the symmetrical anti-node of B (Fig. 2-4b) and is thus a directional force for the move from F to B. In later stages, the transposed sequence is also used in the return to F from B. For example, in bar 160 the 'cello introduces a corrupting C natural into the strongly established B minor and is followed in bar 161 by the piano's B^b. The transposed sequence's A, C[#] and G occur naturally from the melody in the B minor mode, but the anticipated D[#] appears in the piano bass line at bar 163 before the arrival back in F at bar 165.

Another example of local symmetry can be found in the central inner sections. It is introduced first by the piano in the *Allegro brillante* (bars 69-80 and 84-99) where an alternating F[#] and E pattern¹² in the right hand is mirrored by the left hand's B and C[#], an inversion around the D-E^b dyad. This idea is taken up in the subsequent *Andante tranquillo* and becomes one of the main themes for this calm inner section as shown in Fig. 2-5.

¹¹ Notably the piano bass line and some of the short phrases in winds and 'cello, for example, the G^b and E in the flute phrase in bars 14-16.

¹² F[#] and E are themselves symmetrically placed around the original F centre.

Andante tranquillo (♩=72)

138

The musical score consists of five staves: Flute, Clarinet, Horn, 'cello, and Piano. The Flute, Clarinet, Horn, and 'cello parts enter at measure 138 with a piano (*p*) dynamic. The Piano part has a more complex accompaniment with a rocking rhythm. The motif is symmetrical, with the piano part forming a vertical mirror of fifths in the B (and equivalently F) axis.

Figure 2-5. Symmetric motif used to introduce the central section.

The piano motif is formed by pairs of fifths vertically mirroring each other in the B (and equivalently F) axis. The simple quaver rocking rhythm is derived directly from the very opening gesture (Fig. 2-3) and is used as a unifying factor within the piece. The motif is then taken up by the winds and 'cello and more freely developed. Whilst the exact symmetry of the piano motif is not maintained, the underlying feel of the initial harmonies and the B centre are continued. The combination of the resultant harmonies is then distilled into a simple accompaniment which prepares for the voice entry at bar 153.

Both the vocal melody and the instrumental accompaniment are derived from the phrases accompanying the first two verses. The vocal line at bars 153-155 (Fig. 2-6b) is an exact transposition of the 'cello phrase introducing the first verse (bars 11-13, Fig. 2-6a) and the shape of the answering vocal phrase and wind accompaniment (bars 154 onwards) is derived from the flute phrase in bars 14-16. This is an example of the integrating symbolism of 'the B in the F and F in the B'.

Più mosso (♩=88)

(a) 10

Fl.

Vc.

Pno.

13 *con ped. legatissimo*

Fl.

Vc.

Pno.

15

Fl.

Vc.

Pno.

(b) 153 *p*

M-S.

The earth com-pels The earth com-pels

(c) 181

M-S.

But glad to have sat un-der Thunder andrain with you

186

M-S.

And grate ful too_ For sun light on the gar - den

Figure 2-6. Local melodic symmetries

2.3.4 Closure

Following a brief recapitulation of the opening material (bars 165-171), the setting of the final verse (bars 172-190) draws together all of the main ideas in a calm, coda like, ending.

Although the material in bars 165-171 is very similar to the opening statement, the instrumentation is different and the energy dissipated more quickly. The brief bridge and introduction to the vocal entry (bars 172-173) is clearly based on the piano motif introducing the *Andante tranquillo* but is distorted with the pitches of the sequence in Fig. 2-4 whilst maintaining the same symmetry around the F-B axis.

The vocal entry initially uses the melody of the first verse but moves to a simpler diatonic melody derived directly from the inner section (see Fig. 2-6b/c) and the more relaxed triplet rhythms also help to create a calmer mood. The restless running semiquavers of the opening verses are gone, replaced by the gentle rocking accompaniment of the middle section. Firmly anchored in F, the chromaticism is also gone, coloured only by the occasional G^b emphasising the minor feel of the section. However, the final chord contains no third and the presence of the E^b and G give a slightly ambiguous chord, perhaps hinting at tierce de Picardie, so the music closes, even in uncertainty, with a ray of sunshine.

If it does not stretch the symbolism too far, it might also be pointed out that the 'cello's very first note is in fact an A natural, opposing the general F minor inflexion of the opening. Thus, this symbolic sunlight is indeed present at the very start of the piece and only pointed to at the end. It should be stressed that this was not a conscious choice made by the composer, but it is possible that it might arise from the underlying shaping processes. It is certainly true that much of the musical material of the entire piece is deliberately contained in the opening bars; the presence of the B chord in the first bar, the expanding pitch sequence of the introduction and the symmetrical phrases of the accompaniment in the first verse framing the B in the F.

The return to the opening material for the final verse is thus not a literal recapitulation but intended to be a transformation, echoing the sentiment found at the end of Eliot's *Four Quartets*.

*"And the end of all our exploring
Will be to arrive where we started
And know the place for the first time."*

T.S. Eliot, *Little Gidding* (Eliot 1959, p48)

3 Symmetry

The central ideas of pitch and tonal centre symmetry have been introduced in the previous chapter. In this chapter they are examined in more detail through analysis of the *Horn Quintet*, *Fragments* and *Sextet for Woodwind and Strings*. These are more abstract pieces than *Sick Leave* and *The Sunlight on the Garden*, and various symmetrical constructs played a significant part in their composition. In particular, the *Horn Quintet* and *Fragments* use symmetrical tonal centres as a structural component of the form and develops the two-centred structure of *The Sunlight on the Garden*. The *Sextet* is based on a twelve-note row and its final movement uses equally spaced pitch centres for re-statements of the theme.

The use of more than two symmetrically located tonal centres is based loosely on Lendvai's axis theory although there are clearly precedents directly from Bartók's own works, for example, the spacing of the primary tonal centres of the movements within *Music for Strings, Percussion and Celeste*. The symmetries are not the only significant aspect of the pieces, however. All three pieces use, for example, a twelve-note theme as a structural component. These aspects are also described.

3.1 *Horn Quintet*

The *Horn Quintet* was composed immediately after *The Sunlight on the Garden*. Having used two opposing tonal centres as part of the large-scale structure in the former, it was perhaps a natural step to experiment with using a larger number of symmetrically placed centres in subsequent compositions. Because of their inherent symmetry, Lendvai's axis theory¹³ was used as the starting point for both the *Horn Quintet* and the later *Fragments*. In this theory the twelve pitches of the chromatic scale are divided into three axes, each axis taking on a role analogous to the classical tonic, dominant and subdominant functions.

¹³ Whether or not the theories of Lendvai accurately describe compositional methods used by Bartók, the axis theory is of interest as an organizing principle in itself.

For the *Horn Quintet*, the key structural idea was, very simply, to provide a symmetrical form for the whole piece in which the principal sections were located in the Lendvai tonic, dominant and subdominant axes before returning to the tonic. Note, that for each of Lendvai's axes, there are four pitches, and hence four possible tonal centres. More local symmetries are also in operation, for example, to define the spacing of the voices in the opening fugue as described in Section 3.1.3.

3.1.1 Thematic material

The vast majority of the pitch material is derived from a simple four note cell (Fig. 3-1a). This is extended to form the subject of the opening fugue (Fig 3-1c) and, in a different variation, the main horn theme of the central section (Fig. 3-1d). Both of these themes use all twelve pitch classes although, as several pitches are repeated, they do not form a strict twelve note row. However, both themes can be considered to be derived from the row given in Fig. 3-1b.

(a) (b)

(c) Cello solo (bars 1-7)
Lento, with intensity ($\text{♩}=38$)
p

(d) Horn theme, bars 50-60 (not transposed)
Allegro agitato ($\text{♩}=116$)
mp *mf*

Figure 3-1. Pitch material from the *Horn Quintet*. Example (a) shows the primary cell and (b) the underlying row for the fugue subject and horn themes. Note that the horn theme is transposed up by a semitone with respect to (b) and the pitch numbers shown correspond to the transposed form.

When considering the tonal centre of the various statements of the themes, the musical context has a significant impact. The row in Fig. 3-1b starts on D^b (rather than C) because it generally agrees with the perceived centre of both

themes; in the opening two bars of the fugue subject it is easy to pick up the outline of a D^b/C^\sharp minor scale (although a sense of C is also possible given the opening note is a C) and the first few bars of the horn theme are clearly in D minor (transposed up a semitone with respect to the basic row) and this is strongly reinforced by the accompaniment. In later statements, however, the tonal centre identified by the ear can be different from absolute transposition level. For example, the reappearance of the fugue subject at bars 102-123 is transposed up by a major sixth to B^b with respect to the row given in Fig. 3-1b; the ear, at least that of the composer, more readily perceives the initial A as the tonal centre of the phrase, a minor sixth up from the underlying row. This is due to several factors; the use of only a phrase fragment, the augmentation of the phrase, the accompanying figures (Violin 2 suggests G, although the viola gives an E^b root) and the larger context of the section with the earlier statements by the horn in D and F.

There is certainly some ambiguity as to whether the rising semitone suggests the first note is a leading note, giving a tonal anchor to the pitch of the second note, or whether the subsequent falling semitone suggests a Neapolitan effect, anchoring the phrase at the pitch level of the first and third notes. Musically this is not a problem, in fact the ambiguity perhaps adds to the overall flavour of the piece. However, this makes it more difficult to analyse the overall form in terms of tonal centre. In the analysis that follows, the transposition of the perceived tonal centre of the phrase, rather than that of the row, is generally taken as the significant component.

3.1.2 Structure

At the top level, the piece falls into three main sections, a slow fugal introduction for strings, a faster set of variations with the horn to the fore and a coda returning to the slow opening tempo. Of itself, the slow-fast-slow structure gives an additional symmetry to the piece although the loose arch form arising is considered more a matter of musical balance than a specific "designed in" symmetry of the composition. Given the common pitch material across sections, the form is better described as a theme and variations and is also linear rather than cyclic.

The inner section itself comprises three parts, each a variation on the underlying pitch material. Pitch-wise, each variation is located in one of the three Lendvai functional axes and it is this which gives rise to the symmetrical arrangement of tonal centres outlined at the beginning of the section. In the context of Lendvai's axis model, there are four pitches associated with each of the three functional areas, thus the music is free to move between certain pitch centres whilst remaining within the same Lendvai functional axis. Given that the opening and closing sections are strongly centred on D^b/C[#] this is taken as the fundamental tonal centre of the piece and the other pitches of the associated tonic axis are E, G and B^b. It follows that the dominant axis comprises D, F, G[#]/A^b, B and the subdominant axis C E^b, F[#]/G^b, A.

Table 3-1 below summarizes the main sections and the corresponding tonal centres and Lendvai functional axes. Each is described in more detail in the following subsections.

Section	Bar	Tempo	Tonal Area	Lendvai Axis	
Opening	1 – 41	<i>Lento</i> (♩=38)	D ^b , G, E, B ^b	Tonic	
Inner sections	Variation 1	42 -101	<i>Allegro agitato</i> (♩=112) □	D, F, G [#]	Dominant
	Variation 2	102 - 147	<i>Serenely</i> (slightly slower)	A, C, E ^b	Subdominant
	Variation 3	148 - 206	<i>Allegro con fuoco</i> (♩=124)	E, G, C [#]	Tonic
Coda	207 - 236	<i>Lento</i> (♩=38)	C [#]	Tonic	

Table 3-1. Main sections of the *Horn Quintet*

3.1.3 Opening Fugue

The opening section introduces the main thematic material in the form of a fugal exposition on the strings and prepares the way for the horn entry just before the start of the second section.

The fugue subject is given in Fig. 3-1c above. In the spirit of the symmetric division of the chromatic scale underlying the whole piece, the various voice entries are spaced equally across the octave keeping them all in the Lendvai tonic area. The opening 'cello entry is centred on D^b and the real answer on the viola (bar 8) is at its counterpole G (the 'principal branch' of the axes in Lendvai's terminology). The subsequent statement and answer by the two

violins (bars 14 and 21) are centred on E and B^b respectively (the 'secondary branch' of the Lendvai axis).

The countersubject and other accompanying material is freely written, although it is noted that the four note rising chromatic phrase that first appears in the 'cello in bars 15-16 becomes a more significant accompanying motif in each of the inner sections, for example, violin II in the *Allegro agitato* bars 74-77, *Allegro con fuoco* bars 152-155 and in a contracted form in bars 102-109.

The fugal exposition (bars 1-27) is followed by a short bridge (bars 28-41) into the *Allegro agitato*. This bridging section is located in the Lendvai dominant axis with canonic statements of the subject centred on F (viola bar 28), A^b (violin I bar 30) and B (violin II bar 32) leading to the first horn entry on A^b/G[#] in bar 37. Although in the Lendvai dominant axis, the emphasis on only three of the four axis pitches (F, A^b, B) is intended to provide direction towards the D centre which is clearly established at the opening of the *Allegro*. This is an example of using symmetrical constructs so that a "composition can be motivated to fill gaps within [interval] cycles" (Lansky *et al*, 2010, section 4.i). The horn's G[#] to D transition across the phrase is also meant to provide impetus whilst remaining in the same axis.

3.1.4 Inner section: main horn theme / first variation

In the inner sections the tempo increases significantly and the horn comes to the fore using first the primary variation of the theme shown in Fig. 3-1d. This melody is designed to exploit the traditional 'heroic' aspect of the horn. After a short introduction at the new tempo (bars 42-49) confirming the D centre, the horn enters at bar 50 followed by a repetition a minor third up at F (bars 70-90) keeping it within the Lendvai dominant axis. Whilst keeping in the same functional axis, the shift of pitch centre upwards provides forward direction to the section, the ultimate goal being the climactic third variation.

The violins' semiquaver figure accompanying the horn (bars 42-57) is derived directly from the primary cell (Fig. 3-1a). Starting in the Lendvai dominant axis, it cycles through different transpositions moving through the subdominant and tonic axes before returning to its original transposition an octave up. This movement through the different functional axes is intended to give harmonic

movement and direction to the accompaniment as well as that provided by line and rhythm. It could also be considered to mirror at the local level the larger tonic-dominant-subdominant form. The complete cycle repeats throughout the section at different pitches of each axis; starting on D it moves up to F with the repetition of the horn theme, and then to G[#] for the bridge into the second variation (bars 84-101).

The bridge is simply a continuation of the accompaniment pattern rising through three octaves from viola (bar 84) through violin II (bar 90) to violin I (bar 96), progressively adding in other layers of the figure, either transposed or offset in time, to create a chaotic texture moving towards the sudden quiet and clarity of the second variation.

3.1.5 Inner section: second variation

The relative calm of the inner variation is meant to be a short period of reflection, delaying the arrival of the overall climax in the third variation. Although the accompaniment from the first variation is continued, keeping the underlying agitation and movement, the main theme is now an augmented version of the opening fugue subject. This is played out in full (bars 102-131) alternating between horn and strings in a high register on the one hand and low strings on the other.

As described in the opening section, the intention of the overall tonal plan was to place the second variation in the Lendvai subdominant region. Although the transposition of the theme to start on A leaves it in the Lendvai tonic axis (C[#]-E-G-B^b), the context causes the ear to locate it more in the subdominant axis; the elongated A-B^b-A phrase establishes an A centre (rather than the A acting as a leading note to B^b, the B^b falls with a Neapolitan gravity back to the A), and the viola and violin II accompaniment are more consistent with the subdominant axis (E^b-G^b-A-C) against which one tends to hear the A-C (as opposed to the B^b-D^b) as the anchoring pitches.

The move towards the final section starts at bar 132 with a restatement of the main horn theme on the violins. Doubling a major sixth apart helps thicken the texture but also, with the lower part starting on E^b, below the first violin's C, reaffirms the statement in the Lendvai subdominant axis.

3.1.6 Inner section: third variation

The third and final section is the main climax of the piece. Fragments of the theme are brought together; the semiquaver figure of the inner variations against the outline of the fugue subject. Pitch centres of E, G and D^b dominate, placing the section back in the Lendvai tonic axis. The focal point of the section is the chords at bar 177-180 (centred on G, the counterpole of the coda's C[#]) before a sudden reduction in dynamic and gradual slowing moves towards the coda. This bridging material is characterized by its convergence on C[#].

3.1.7 Coda

The entry into the coda at bar 207 is the final point of repose and reflection. The opening tempo is re-established and a simple diatonic melody, firmly grounded in C[#] minor by pedal notes in the strings, is played by the horn. The mood was originally hinted at in the second variation (bars 102-131) but the scurrying accompaniment is replaced by sustained chords and a simple imitative countermelody. The shift from a more chromatic language might be considered an example of the two opposite spheres of attraction proposed by Lendvai, not the opposites of pole and counterpole nor the tensions of tonic and dominant, but the more fundamental opposition of "major-minor tonality (the tonality of diatonicism) and the axis system (the tonality of chromaticism)" (Lendvai 1999, p. 15).

In the final bars (bars 223-236) the horn returns to slightly more chromatic material, rising over two octaves it roughly outlines the shape of the opening fugue subject.

3.2 *Fragments*

Following on from the quintet, *Fragments* experimented with another approach to form based on symmetric tonal centres. Whereas the *Horn Quintet* used a symmetry based on the Lendvai functional axes (each comprising four pitches), *Fragments* uses four discrete pitches symmetrically distributed across the octave as the significant centres of the composition. This set is equivalent to a single Lendvai axis.

3.2.1 Form

In addition to the symmetrical spacing of the tonal centres of the main sections, *Fragments* has a partially symmetric ABCA arch-like form. Together, these two structures generate a cyclic form, the end of the piece could flow into its beginning in terms of mood, tempo and harmony. This completing of the circle is intended to express the idea of making the fragments (in this case, the fragmentary thematic material and sequence of variations) whole.

From a thematic perspective, the form can be simply described as two thematically identical outer sections enclosing two inner variations. The tonal centres of the two outer sections are such that the final one ends on E, the starting point of the first. In terms of tempo, the outer sections and first variation are *Lento*, whilst the second and more substantial variation is a faster *Agitato* bridged on both sides by short *Andante Moderato* sections.

Each variation is separated by a simple unadorned statement of a 12-note theme (Fig. 3-6). This is always played solo by either the 'cello or viola creating a linking recitative announcing each new tonal centre.

Lento (♩=48)
Solo / Recitative

Viola

p cantabile con poco rubato

Figure 3-2. Twelve-note theme from *Fragments*

The tonal centre of the theme rises a minor third on successive statements and prepares the way for the subsequent variation. This symmetrical arrangement is illustrated in Fig. 3-3 below.

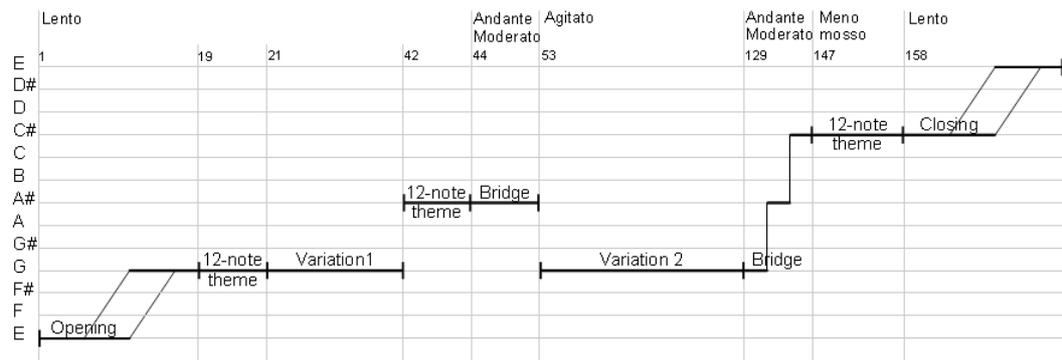


Figure 3-3. Tonal Centres in *Fragments*

3.2.2 Musical Material

All of the musical material within the main sections is based on a simple symmetric four-note cell (E-F#-G-A) taken from the Dorian scale, itself a completely symmetric structure.

The opening and closing sections are based on a simple process of bringing together transposed versions of the basic Dorian cell (Fig. 3-4a) at different speeds. The 'full speed' version of Violin I repeats the cell eight times, each repetition being transposed down by a perfect fourth. It thus moves from E to F during the course of the opening and comes to rest on B^b. Violin II enters after Violin I has completed its first cell and plays the cell at half the speed. It starts on G[#] and successive repetitions are transposed down by a minor seventh. Similarly, the viola enters after Violin II has completed its first cell and the 'cello after the viola. Both play the cell at approximately half the speed of Violin II, although note lengths are varied slightly so that parts move at different times. The lower strings converge on G below the B^b of Violin I suggesting a E^b major chord (bar 16). Three pizzicato G minor chords (bars 17-18) prepare the first announcement of the twelve-note theme (bars 19-20).

The first variation (bars 21-41) takes the four note Dorian cell and develops it in a more harmonic way than the opening process (Fig. 3-4b). Although clearly rooted in a minor mode on G, the mix of E and E^b in the accompaniment gives an ambiguity to any exact mode. After a brief climax at bar 34, the music dies away before the next statement of the twelve-note theme at bar 42.

Unlike Berkeley's *Aria*, however, the 'cello's repetitions of the row ascend in major thirds from D, through F \sharp and A \sharp , to return to the opening D (bar 155). On each repetition, the original flute melody is taken up by a new instrument; the clarinet in bar 151 and viola in bar 154. Between bars 155 and 168, slightly modified versions of the 'cello's opening melody are used in a descending sequence of transposition levels (D, B \flat , A \sharp) with the theme passing from 'Cello to violin at the climax point of bar 159. The final bars are formed by two further variations of the theme, both in D. The three strings first play in canon (bars 169-172) and then pizzicato 'cello outlines the pitches (bars 175-181).

Much of the material for the opening *Prelude* and central *Scherzo* is derived from the *Loure's* main theme. The *Prelude* uses successive pairings of the row pitches to generate a sequence of intervals as shown in Fig. 3-5b. Various pairings of the resultant thirds are presented in the woodwind alternating with a tetrachord played on strings formed from the pairing of the E \flat -G \flat and A-C \sharp intervals. The chordal passages are interspersed with a fragment of the *Scherzo* material on clarinet and flute (bars 16, 25, 28) and *cantabile* phrases on 'cello (bars 17-24) suggesting the final *Loure*.

The *Scherzo* uses the first four pitches of the row in a rhythmic motif (bars 33-36) which, along with other simple variations, punctuate the movement. The main theme is a chromatically exhaustive melody (bars 37-43) which is passed between various instruments of the ensemble. The movement concludes with a short passage of quasi-aleatoric writing similar to that used in bars 84-101 of the *Horn Quintet* and developed more fully in *Nocturne* (see Section 5-7).

4 Intuition

"You will ask me whence I take my ideas? That I cannot say with any degree of certainty: they come to me uninvited, directly or indirectly. I could almost grasp them in my hands, out in Nature's open, in the woods, during my promenades, in the silence of the night, at the earliest dawn. They are roused by moods which in the poet's case are transmuted into words, and in mine into tones, that sound, roar and storm until at last they take shape for me as notes."

Beethoven¹⁴

This chapter returns to the ideas of initial impulse and integration introduced in chapter 1 and, in this context, discusses the portfolio pieces *Impromptu*, *Reverie* and *Impressions*. These are described as intuitive pieces in that they are shaped primarily by images internal to the composer rather than any explicit formal design or process. The inner image acts as both initial stimulus and an overall integrating force as the composition emerges.

In the same spirit of Ligeti's view on programmatic music described in Chapter 1, the pieces described in this chapter are not intended to be *about* the composer's own internal images which shaped them, but result *from* them. The music need not invoke the same images in the listener to communicate, although it is hoped that something of the mood and feel is received. From a psychological perspective, McGilchrist states:

"...music does not symbolise emotional meaning, which would require that it be interpreted; [it] 'carries it over' direct to our unconscious minds. Equally it does not symbolise human qualities: it conveys them direct, so that it acts on us, and we respond to it, as a human encounter."

(McGilchrist 2009, p96)

This direct communicative nature of music is why the intuitive part of composition is so important; the composer must be aware of the human effect of the musical decisions throughout the piece and at all levels of detail. Whilst some effects may be reduced to rules by analysis, to truly create anew requires something more; intuition is an essential perception enabling the composer to judge the rightness of their decisions in both a musical and human sense.

¹⁴ Recounted by Schlösser in *Thayer's Life of Beethoven* (Thayer 1964, pp851-852)

4.1 Intuition and Composition

Intuition has been a significant concept in the development of many philosophical, artistic and psychological schools of thought. Although opinions as to its nature and role are varied, the relevance of intuition to art and aesthetics cannot be ignored. Philosophers such as Schopenhauer, Heidegger and Wittgenstein went as far as to say that the arts, particularly music and poetry, provide a greater insight into the true nature of reality than more analytic philosophies or formal logic¹⁵ (McGilchrist 2009, p156). From a psychological point of view, Jung considered intuition a basic type of human perception (although not one directly traceable to conscious sensory experience), characterised by content that "presents itself whole and complete, without our being able to explain or discover how this content came into existence" (Jung 1991, p538). Such content always seems as though it has been "given" rather than "derived or produced" (*ibid.*).

Tracing a history of intuition and its role in the arts is beyond the scope of this dissertation and this chapter focuses on how intuitive processes can be used in composition. However, it is of note that the composers who have had a large impact on the author are themselves also strongly affected by intuitive thinkers. It has already been pointed out in Chapter 1 that Bayer grouped Dutilleux, Ligeti and Lutosławski together as 'intuitionists'. The strongly literary and theatrical approach to composition of Henze and Rautavaara also reveals a strong intuitive leaning; Goethe, Kant and Schopenhauer had a formative influence on Schoenberg (MacDonald 2008, p121).

Modern dictionary definitions of intuition tend to focus on its non-analytic and spontaneous nature, for example, "immediate insight or understanding without conscious reasoning"¹⁶. However, the roots of the word lie in the Latin *tueri* (to look, watch over, uphold) and *intueri* meaning to observe, consider, bear in

¹⁵ According to Schopenhauer "we can regard the phenomenal world, or nature, and music as two different expressions of the same thing" (quoted in Foster 1999, p245). Wittgenstein and Heidegger both "ended by trying to work out honourable terms on which philosophy might surrender to poetry" (quoted in McGilchrist 2009, p155).

¹⁶ The Pocket Oxford Dictionary, 1996 (third revised edition).

mind¹⁷. In the context of musical composition this kind of meaning is much more apt, describing the process of conscious, but not necessarily analytic, observation of internal images. This delicate state of observation, of watching without interfering, yet active in that the composer can retain what is needed, is described by Copland in speaking about the creative process, of "making something out of nothing", like a "magician" (Copland 1952, p42). In moments of inspiration, Copland says:

"One half of the personality emotes and dictates while the other half listens and notates. The half that listens had better look the other way, had better simulate a half attention only, for the half that dictates is easily disgruntled and avenges itself for too close inspection by fading away entirely."

(Copland 1952, p43)

When the observation is less spontaneous, but intuitive nonetheless in that something complete - if partially veiled - is apprehended, the process is more akin to a process of discovery. The details of the whole are slowly revealed through patient observation, not assembled from components or constructed from a plan. MacDonald asserts that "some vision of the work as an entity precedes the composition of its tiniest cell" and that this vision "slowly assumes a distinctive size, shape, colour, internal motion, and character according to its inborn expressive intention. Like a ship at night or an iceberg through the fog, its bulk looms in the composer's mind." (MacDonald 2008, p135). For composers such as Beethoven it would appear that they could let the idea grow and develop in their minds over extended periods until it became a matter of simply writing it down (Thayer 1964, pp851). For others, there will almost certainly be a process of trial and error; of writing, checking, refining and writing out again. In this more sustained use of intuition, the composer is continually checking the congruence of the outer musical manifestation of the emerging composition with his or her own inner image. Copland talks about "awareness of one's awareness" and of being "inside and outside the work at the same time" guiding the composition "to its inevitable termination" (Copland 1952, p45).

¹⁷ The New Shorter Oxford English Dictionary (1993) and Pocket Oxford Latin Dictionary (1995).

Simply because intuition does not draw on consciously rational or logical processes, it does not mean that it contradicts them; it stands outside and beyond them and can be seen as complementary. In the view of the author intuitive and logical approaches to composition are another way of viewing the roles of 'heart and head' already discussed in Chapter 1. They very much need to work together to create a finished piece of music. Thus, within composition, conscious analysis and logical structures can be used to refine and develop initial ideas and in turn stimulate further intuitive leaps. This is exactly the relationship described by Goehr quoted in Section 1.4 and corresponds very closely to a more general neurological point of view given by psychiatrist Iain McGilchrist describing creativity and understanding of works of art:

"there is a progress from an intuitive apprehension ... via a more formal process of enrichment through consciousness, detailed analytic understanding, to a new, enhanced intuitive understanding of this whole, now transformed by the process that it has undergone."

(McGilchrist 2009, p206)

These intuitive aspects complement the more analytic parts of composition and, between intuition and logic, skill and craftsmanship also play an essential part. No matter how wonderful an initial idea may be, if the final musical output does not take into account the realities of the instruments and performers, of acoustics and orchestration, it will not be translated into a viable piece of music, nor will it, in the end, communicate with an audience. The acquisition and development of formal skills can itself increase confidence allowing for a greater release of creativity rather than being a trammelling force. For example, the strictly symmetrical motifs of open fifths in the slow inner section of *Sunlight on the Garden* (Fig. 2-5) can be seen as seeding the idea for the rocking accompaniment in the inner section of the *Impromptu*; the harmonic structure of *Sick Leave* influences the stacked fifths in the opening of the *Réverie*. In the limit, all of life's accumulated experiences can become raw materials when used intuitively by the imagination although often the time and manner of their appearance may be unknown or surprising even to the composer.

The compositional process and the relationship between the conscious and unconscious, the analytic and the irrational, is superbly summarized by Ligeti and echoes almost exactly the more generalized description given by McGilchrist of the journey from intuitive apprehension, through conscious analysis, to enhanced intuitive understanding.

"Music is for me in the first instance something completely intuitive. Then, however, I begin to work conceptually, making concrete the original purely acoustic or musical vision. In finding a conceptual development that matches the musical vision, during which I prescribe rules for myself as to composition or form, something concrete emerges from the general vision, and that is the score. At the performance, however, there is a shift back to the original, general vision. ... It is precisely this tension between the rational, constructed element on the one hand, the visionary on the other, that plays such an important role in composing for me."

(Ligeti 1983, p101)

4.2 Intuition and *Impromptu* and *Rêverie*

Both *Impromptu* and *Rêverie* have been labelled 'intuitive' pieces because they set out to express an inner feeling and had no preconceived or formal design; the form and the musical detail emerged as composition progressed, like a pot growing from clay on a potter's wheel. To the composer, the process felt very much like Rautavaara's description of musical discovery and of listening to the music as it took shape; an embodiment of McGilchrist's view of the creative process given in the preceding section. In this context, intuition plays a significant part in guiding the many decisions of the composition process. It also provides the initial impulses, presenting ideas in to the attentive consciousness, the watchful awareness described by Copland. Details of the background and music of the two pieces are given in the following sections. This section describes some of attributes they have in common and, in particular, the way in which both intuitive and analytic processes have come to bear on the composition process.

Although intuition also played a large part in the settings of the poems described in Chapter 2, they differ from *Impromptu* and *Rêverie* in that they had an explicit external object - the poem - as part of the guiding influence.

These pieces grew from an internal model, the inner imagery of the composer. However, the composition process is still an attempt to re-express in musical language something already present in another form. An external object such as a picture or poem can be perceived directly by another person (although individual responses to the same object can vary hugely) whereas for the inner object, only the resultant music is heard. Both inner and outer objects, however, have the same effect on the composer and are examples of Schoenberg's view that "Moods and pictures, though extra-musical, thus became constructive elements, incorporated in the musical functions; they produced a sort of emotional comprehensibility." (Schoenberg 1941, p216).

An inner 'image' does not need to be specifically visual but can be a fully recalled scene or imagined situation drawing on all of the senses; smells, sounds, feelings and so on. The mind does not need to divide or categorize these elements to recall them; in fact doing so will generally diminish the whole. That is not to say that attention cannot focus on some aspects over others or move between them. It is also worth bearing in mind that even our cultural convention of five senses is far from unique and other times and cultures have divided and labelled things differently (Krznaric 2011, pp153-157). This is particularly relevant for *Rêverie* which draws on less visual imagery than any of the other compositions and is based more on nostalgic recollections of various travels in southern Europe. Nonetheless, regardless of the inner imagery - even if harder to describe in words - the forming process is much the same and echoes Ligeti's comment of "everything is transposed into music!" (Ligeti 1983, p102).

The musical language of both *Impromptu* and *Rêverie* is largely diatonic, almost pentatonic at times (the melodies in bars 25-29 of *Impromptu*, and bars 46-51 of *Rêverie* for example) and the use of open fifths (for example *Rêverie* bars 10-16 and *Impromptu* bars 25-29) give an 'old' and slightly rustic feel reflecting the composer's own inner images which lie behind them. Such modalities are not used rigorously, however. The diatonic melody at the start of *Impromptu* (bars 3-7) is harmonized by a sequence of consecutive sevenths to help create a dreamy atmosphere and blur the simple diatonicism of the top-line. In *Rêverie*, the pentatonic outline of the clarinet melody uses

short sections of the underlying F minor / A^b major scale (for example, the clarinet's falling B^b-A-G in bar 48, Fig. 4-5) and the music uses both the D[♮] and the D^b in the implied scale (bar 44, for example) creating a slight harmonic ambiguity. These devices were employed initially because they 'sounded right' to the composer; a musical fit to the inner picture. However, once the ideas had arisen, presented to the analytic mind, they were used more consciously.

In the case of *Impromptu*, the seventh-based chords became an integral part of the music. In one form or another, they appear in almost every bar of the piece, from the introductory arpeggios of the first two bars and the harmonization of the main melody, through the various bridging passages (for example, bars 18-19 and 22-23) and slower inner section (bars 25-35) to the final, unresolved, last chord. Of particular structural importance, the material for the inner *Andante Semplice* is obtained by transposing the opening C[♯] minor seventh chord to E major seventh and replacing the rapid triplet arpeggios with a gentler rocking crotchet movement. This changes the mood and pace, but the underlying harmonic relationship provides inner consistency. Functionally, the modulation is trivial, but the continually alternating fifths on E and G[♯] give a degree of ambiguity between E major and G[♯] minor and, when combined with the simple melody outlined above in fifths and sixths, give rise to some more colourful, non-functional harmonies.

The auxiliary theme in the outer sections (bars 15-18, Fig. 4-2) is also derived from the broad outline of the melody, but the syncopation and crisp dotted rhythms, combined with its presentation in octaves in the bass register, create a more turbulent feeling than the crotchet triplets floating over left hand arpeggios. Even when transposed to the upper registers and combined with thirds and sixths (bars 38-41) the theme's distinct character is preserved, although the lighter presentation allows it to be heard in a different way depicting, from an intuitive perspective, a transformation from struggle to triumph. These elements may be seen as an example of head and heart working together in the composition; the initial spontaneous creation of fragmentary musical ideas (the opening arpeggio and simple melody in sevenths), consciously developed and manipulated - under the watchful

presence of intuitive awareness - to generate a more extended piece of music which has a logical consistency but at the same time satisfying the internal inner picture which provided the first stimulus.

In a similar way, the use of both D^{\sharp} and the D^{\flat} in *Réverie* arose spontaneously in the composition of the melody. However, once noticed by the analytic mind, the composer actively decided to use the musical effects the device provided - both in terms of a melodic variety and harmonic colour - as elements of the composition. In particular, the raising and lowering of the D makes the modality of the piece ambiguous, neither fully major nor minor, and is used to subtly lighten or darken the momentary mood without changing the overall feel of the piece which might arise from more explicit modulations. It might also be suggested that, in the end, the D^{\sharp} functions as the leading note for the final E^{\flat} chord, not just as an altered sixth of F minor.

The timbres of the instruments also played an important part of the composition process. The evocative chalumeau register of the clarinet and low resonant fifths in the bass of the piano were immediately suggestive of the mood and imagery sought by the composer. However, once sounded, they themselves suggested phrase shapes and musical progressions which can be worked on by the conscious mind. Thus the very opening clarinet motif (Fig. 4-4a) can be logically extended (Fig. 4-4b) and then further embellished (bars 7-10 and 20-26) by simple transposition and intervallic alteration whilst maintaining a dreamy, improvised feel. This in turn lead to further intuitive leaps which gave rise to the more extensive melody of the faster sections.

When a piece of music such as *Impromptu* or *Réverie* is shaped by such inner imagery it is important to remember they are not *about* the image, but a response *to* it. Furthermore, both the inner image and the composer's response, are due to an accumulation of experience rather than being a single 'snapshot'. As Ligeti reminds us, "Creative activity in music, painting or literature is not directly prompted by an experience you have just been through" (Ligeti 1983, p20). As Bartók puts it, art is "produced through the

influence of impressions we gather within ourselves from the outer world" (Bartók 1909)¹⁸.

4.3 *Impromptu*

The music within *Impromptu* was originally conceived as part of a short film and subsequently adapted for solo piano performance. A meeting with the film's director had left the composer with both a strong visual image of light streaming through the windows of an old house and a clear idea of the feelings of peace and acceptance that were at the heart of the film¹⁹; it was these inner images that sought direct expression in the music. For the performance version, a simple ternary structure emerged. The two outer sections (bars 1-24 and 36-65), strongly centred in C# minor, are characterized by the continuously flowing accompaniment of semiquaver triplets. In contrast, the inner section (bars 25-31) moves to E major and is very still and reflective.

The piece is entitled *Impromptu* as the main themes were written rapidly - often at the keyboard - immediately following the discussions with the director and the music retains an improvisatory feel. The opening bars (Fig. 4-1) come directly from simple hand-shapes on the piano and the continuously flowing triplets and minor seventh harmonies establish themselves as primary elements of the music as discussed in the previous section.

¹⁸ See footnote on page 2 for full reference.

¹⁹ The script originally discussed was not, in the end, used for the film. However some of the music composed was subsequently used in the film *Alfonso*.

Allegro Moderato (♩ = 72)

The image shows a musical score for the opening of a piece, titled "Allegro Moderato" with a tempo of ♩ = 72. The score is written for piano and bass. The key signature is three sharps (F#, C#, G#) and the time signature is common time (C). The piece begins with a piano (p) dynamic. The right hand features a melody of crotchet triplets, while the left hand provides a semiquaver accompaniment of crotchet triplets. A first octave sign (8^{va}) is placed above the right hand staff in the second measure. The score includes dynamic markings such as *pp* and *pp₂₀* in the left hand, and the instruction *simile, sempre legato*. The piece concludes with the word *etc.* in the right hand staff.

Figure 4-1. *Impromptu* opening

Hand-shapes also guide the music and harmonies in later parts of the composition, for example, the bridging passages at bars 18-19 and 22-23 and both the melody and accompaniment in the slower inner section (bars 25-35). It may well be that the physical process of playing facilitates easier access to the more intuitive parts of the self and helps distance the potentially disrupting influences of the analytic mind, thus cultivating the watchful awareness talked about by Copland.

The melody that appears²⁰ at bar 3 is simple and relaxed; the crotchet triplets help to create a vague and dreamy mood despite the continuous triplet semiquaver accompaniment. There is perhaps a sense of two different times, or even of two worlds. The thickening of the melody with consecutive sevenths creates a further harmonic blurring and, without being particularly dissonant,

²⁰ The melody's opening phrase is anticipated by an inverted "pre-echo" in the ascending bass notes of bar 2. There is also a similar relationship between the start of the second phrase and bar 1. This is not so much by careful design but, in the composer's own view, from being "cut from the same cloth".

suggests a lack of resolution but not unease. The piece itself ends on a slightly ambiguous seventh/ninth chord.

Each of the outer sections is punctuated by a slightly more turbulent melody (bars 15-18, 38-41 and 55-58) shown in Fig. 4-2; this is associated with elements of struggle in the film's script. The theme is also used in the bridge from the inner section back to the restatement of the melody (bars 36-41). Here it is moved from the piano's lower registers to the upper ones suggesting, in the context of the film, an element of redemption.



Figure 4-2. Auxiliary theme from *Impromptu*.

The slower inner section is built around a rocking figure of open fifths (Fig 4-3). This gesture has already been suggested by the alternating C# / B bass notes of the left hand found in the opening bar, although the interval is now augmented to a major third. The chordal accompaniment is also derived directly from the hand-shapes of the opening bar by transposing the C# minor seventh chord up to E major. The section is reminiscent of the *Andante Tranquillo* in *The Sunlight on the Garden*. Although not strictly symmetrical around a single pitch centre, the sequence of fifths trace out a simple pattern under the melody.



Figure 4-3. Theme from *Impromptu* central section.

4.4 *Rêverie*

Written shortly after *Impromptu*, the *Rêverie* for clarinet and piano also has something of an improvisatory feel, especially for the clarinet in the slow opening and inner reprise (see for example, Fig 4-4 and bars 20-25). Very much in the mind of the composer whilst writing this piece, were images of a Mediterranean landscape - not just visual pictures, but ones including the other senses; impressions of warmth and scent very different from more Northerly climates, and moods of daydreaming and optimism.

Much of the musical material is derived from the same basic motif but is presented in two distinct ways. The first is quite static and associated with images of hazy midday heat. The second is more lively and full of movement and playfulness with the clarinet in many places leading a dialogue, the piano answering and supporting. These two moods alternate in the four sections which make up the piece.

The whole piece grows out of the opening motif (Fig. 4-4a) introduced by the clarinet in its evocative chalumeau register; both the rhythmic and melodic contours of these three notes permeate the subsequent music and are developed into the main themes of the faster sections. The initial statement of the motif explicitly outlines the primary intervals of the octave, fourth and fifth whilst the answering motif in the second part of the phrase (Fig. 4-4b) is contracted and introduces the intervals of sixth and third outlining the first inversion of a minor triad. This contrast of open octaves and fifths with inverted triads is characteristic of both the harmony and melody throughout the piece. The interval of a sixth, by the mixed use of both D^{\sharp} and the D^{\flat} against the overall F minor / A^{\flat} major background, also contributes a certain modal feel to the piece, neither fully major nor minor. This role is first hinted at in bar 5 by the piano's D^{\sharp} arising naturally from the stack of fifths built on the opening F. From this low piano 'haze', the clarinet re-emerges at bar 7 and begins to tentatively explore its higher registers. The introduction develops as alternating clarinet lines full of movement contrasting with more static blocks of chords on the piano.

Slow and relaxed ($\text{♩} = 56$)

Clarinet in B \flat

Cl.

Figure 4-4. Clarinet solo from opening of *Rêverie*

The main themes of the second section are developed from the opening material. The phrase introducing the section (Fig. 4-5, bars 43-45) is derived directly from the clarinet motif (Fig. 4-4a/b) and its shape and rhythm is taken up as supporting material for bridging passages such as bars 59-60 and 76-77. It also reaffirms the flat/natural sixth gesture already hinted at in the introduction (bar 44). The main melody (Fig. 4-5, bars 45-48) grows out of the more improvisatory material of the introduction (bars 7-10 and 22-26). Its characteristic falling fourth (e.g., bar 46 and 49) is generally accompanied by a sixth chord contributing to the sunny, but slightly ambiguous modality of the piece.

Light and playful ($\text{♩} = 63$)

Cl.

f *>mf* *p* etc...

Figure 4-5. Start of the second section of *Rêverie*

4.5 Impressions

Impressions was written specifically for a concert of music connected with computer-assisted composition²¹. Composed for piano, violin and horn, the piece is something of a hybrid; much of the music was composed quite intuitively but is based on a chord sequence derived directly from a set of mathematical equations.

The unifying force behind the piece was an internal image of the various mathematical ideas of chaos and complexity. In particular the idea of 'the

²¹ Peninsula Arts Contemporary Music Festival 2010, Plymouth.

routes to chaos' was used, a description of how a dynamical system moves from a simple, relatively static state to a chaotic one through a sequence of progressively disordered states. Musically, this aspect was manifest as a process of progressively reducing note values throughout the piece whilst maintaining the same underlying pulse. More specifically, based on the idea of 'period doubling' exhibited by some types of chaotic systems²², note values were in general halved in successive stages of the piece.

The piece itself has a passacaglia like form based on a repeating sequence of 20 triads derived from the Lorenz attractor²³ equations; the full details of the derivation are given in Appendix II. The triads are initially sounded by the piano completely unadorned (Fig. 4-6a). All note values are semibreves or breves giving a static, reflective start to the piece and allowing each triad to be heard. The violin enters at the start of the first repetition (bar 24) and is joined by the horn at bar 30. The melodic fragments are derived primarily from the pitches contained in the first five triads, and particular prominence is given to the A, B^b and C[#], the upper three pitches of the first three triads. As the sequence progresses (bars 25-47) shorter note values of minim, crotchet and quaver are introduced (Fig. 4-6b).

²² For example, the one-dimensional logistic map describing a simple predator-prey ecological model; if food is abundant, the population grows but consumes more food, if the population grows too large, food becomes scarce and the population shrinks. See Ott 1993 pp31-44 for a detailed description.

²³ So called because they were published by Lorenz in his 1963 paper on modelling atmospheric convection. These equations have since become an extremely well known example of a chaotic attractor in the field of dynamical systems.

(a) Piano opening (bars 1-24)

(b) Violin bars 24-31

(c) Piano bars 71-73

Moderato ♩ = 96

Figure 4-6. Pitch material for *Impressions*.
 (a) Triad sequence (b) Violin theme (c) Piano final section

The second repetition (bars 48-70) starts with a crotchet-based figure in the piano and, as the section progresses, quavers, triplets and then semiquavers are introduced. The semiquaver movement is then sustained from the start of the next section (bar 71) to the end of the piece. In this final section, the accompanying triads are replaced by the repetitions and variations of the motif shown in Fig. 4-6c.

The piece is named *Impressions* because, in the end, the music is the result of the composer's own response to the ideas of chaos and complexity rather than the output of a mathematical process. Even the use of the Lorenz attractor equations to generate the sequence of triads has a number of arbitrary decisions inherent in the process. For example, the mapping of the continuous three-dimensional space to discrete notes in the conventional chromatic scale of Western culture and the vertical ordering and spacing of the pitches within each triad was achieved by choosing certain parameter values from many possible ones. These were all guided by the composer's own aesthetic choice; parameters values were chosen to give the pleasing results.

5 *Nocturne*

This was the first piece written for orchestra so one of the main goals was to gain experience in using a wider range of instrumental resources than used in earlier compositions. The larger resources also provided the opportunity to use non triadic chord-aggregates comprising all twelve pitch classes; this, and other aspects of the vertical organization was inspired in particular by Lutosławski's ideas and compositions – in particular *Musique funèbre* (1954) and *Interlude* (1989). As the last piece written for the portfolio, *Nocturne* draws together the central portfolio concepts of symmetrically placed tonal centre, twelve-note melody and pitch organization (especially with regard to pitch class complementarity) and the use of poetry as an organizing force.

A small chamber sized orchestra was chosen as a stepping-stone to the use of larger resources for future compositions. The actual makeup was as follows:

- Woodwind:* Piccolo
Flute (doubling alto-flute)
Bb clarinet
Bass clarinet.
- Brass:* Trumpet
Horn in F
Trombone.
- Percussion:* Side drum
Bass drum
Suspended cymbal
Timpani (x3)
Piano
- Strings:* violin I & II, viola, 'cello and double bass
(4,4,3,4,2 in first performance)

5.1 Poetic Influences

Although the research goals have been outlined, the musical shape and mood of the piece arose directly from an intuitive reading of Neruda's poem *The Watersong Ends* (Neruda, 1967). The poem immediately suggested various images and was used to guide the selection and development of the musical material. The piece, however, is in no way meant to be programmatic; there is no explicit narrative or even an attempt to arrange the images in the same order as in the poem. The piece is deliberately entitled *Nocturne* for its more general evocations and is meant to leave the listener free to form their own impressions. The composer's intention is to "express the idea behind the poem" (Schoenberg 1946, p55).

Not all musical episodes correspond directly to a part of the poem, rather an overall feel is generated which attempts to recreate, at least for the composer, the mood of the poem. For example, the extended bridge between the first and second section (bars 46-67) is intended to be both a musical balancing device and a means to create tension and anticipation before the second section which is inspired by the phrase in the poem "night came galloping down".

The fragments of the poem that are associated with specific parts of the piece form a top-level framework and are moved between by musical, rather than narrative, means. In the description that follows, details of particular parts of the poem are given in the associated musical sections.

5.2 Pitch Material

The substantial part of the musical material is derived from two sources; the symmetrical partitioning of the twelve pitch classes into three tetrachords and a melody which uses all twelve pitch classes.

bridge. The three sections have contrasting moods and the figure below summarizes the characteristics of each.

Section	Bar	Cell	Tempo	Dynamics	Mood
Opening	1 - 45	X	<i>Lento Lontano</i> ♩ = 48	<i>pp - mf</i>	Slow and subdued but restless. Movement
Bridge	46 – 66	-	<i>Moderato Inquieto</i> ♩ = 84	<i>p - f</i>	Expectant.
Central	67 – 125	Z	<i>Allegro Moderato</i> ♩ = 96	<i>p - fff</i>	Agitated, loud, movement towards climax
Final	126 - 149	X'	<i>Tranquillo</i> ♩ = 48	<i>pp - p</i>	Static, still, peaceful

Table 5-1. Main sections of *Nocturne*

Although each of the main sections uses one of the tetrachords as the primary material, the other tetrachords are used as complementary material. It is perhaps more accurate to say each section uses one of the tetrachords as its starting point and combines the others in varying ways as the section progress. The main musical sections are now described in detail.

5.4 Opening Section – *Andante Lontano*

“...the night was stirring with secret sounds, darkness of jungle...”

The opening section sets the overall mood of the piece. As a nocturne, the suggestion is clearly one of night-time but, more specifically, the intent is to convey the ambiguity and uncertainty of darkness and yet the realisation that one's surroundings can be clearly perceived through the other senses. The primary musical devices for this are:

- the use of blurred and slowly shifting harmonies
- a move from a very sparse harmony to pitch fields using all twelve pitch classes.

The section may be divided into two main sub-sections preceded by a short introduction (bars 1-9). These opening bars use widely spaced strings and timpani to establish the F-B harmonic axis whilst the woodwind start to introduce new pitches, opening out from pitches F3 and F4 in the central register. The trumpet and horn introduce the elements of the sixth and acciaccatura which also act as secondary motifs throughout the piece.

The first subsection (bars 10-28) is a slow accumulation of pitches and instruments that build towards the twelve-note pitch fields and melody which are the essence of the second subsection (Figure 'C' - 'D', bars 29-45). It is built on a harmonic framework derived from various overlapping transpositions of the X cell as shown in Fig. 5-3 below:

The figure shows a musical score for two staves (treble and bass clef) with a complex harmonic structure. Brackets above and below the notes indicate transpositions of an 'X cell'. Section A (bars 1-9) features transpositions X0 and X5. Section B (bars 10-18) features transpositions X5, X6, and X11. Section C (bars 19-28) features transpositions X0, X5, X6, and X11. The notes are widely spaced and often include accidentals, creating a blurred harmonic effect.

Figure 5-3. Harmonic framework of first part of opening section

The detail of the part writing is heavily influenced by the micro-polyphony of Ligeti and the quasi-aleatoric writing of Lutosławski as found in his *Interlude* of 1989 (Bodman Rae, pp198-199). The overall intention is to create a harmonic blurring with no strong sense of pulse but a slow asynchronous drift of the harmony.

Only strings are used between bars 10 and 18 (Figure 'B'). In a Ligeti like manner, different rhythms are used for different parts. Violin 1 and viola move predominantly in quavers (but violas moving generally off the beat), violin 2 uses mainly crotchet movement and 'cellos and bases use crotchet triplets. The violin 1 line is decorated to give a more melodic feel and continues to use occasional acciaccaturas introduced by the brass.

As well as the rhythmic blurring, harmonies are blurred by two processes. First of all, each part moves to a new note in the framework at a different time from the other parts. Secondly, a part does not stay on a single pitch all of the time

but moves between neighbouring notes in the framework. Each note is considered to have two horizontal neighbours (the notes either side on the same line) and, in the case of the inner parts an additional vertical neighbour from the upper or lower line. For example, the second note of the violin 2 part (A#/Bb) has horizontal neighbours A and B and a vertical neighbour E from violin 1. The vertical neighbours of the viola part come from the bass line. From Figure 'C', the woodwind start to enter, doubling and embellishing the string parts with the flute playing in canon with violin 1 (1 crotchet beat ahead). The trumpet and horn take freer parts, with the horn in particular having a melodic rising line which mimics the 'cellos and basses.

The focal point of the first section is the piano entry at Figure 'C' (bar 29) where the full twelve note pitch field is established and prepares the way for the melody entry at bar 32. Musically and poetically, the melody is the heart of the first section. It has no direct correspondence with any specific line in the poem but is meant to capture the mood of the first part of the poem of a man in the midst of a jungle.

The main melody is played by the upper strings whilst the lower strings play a variant of it in canon at an augmented fourth. This is shown in the lower two staves of Fig. 5-4.

Throughout this sub-section (bars 29-41) the piano uses an arpeggiated figure to define a pitch field that is complementary to the other parts of the score. In the first two bars (bars 29-30) the piano has only pitch classes from the Z tetrachord whilst the low strings sound those of X (X_0) and the woodwind use the pitch classes in X' (X_6). The complementary partitioning is used in bar 31; the piano taking all pitch classes of X_0 and X_6 and those of Z being sounded by low strings and horn. This Z to X/X' transition in piano and complementation of the accompanying pitch field is used as a cadential analogy to prepare the melody entry.

When the main melody enters at bar 32, the principal pitch classes used by the strings in each bar are used to define a pitch field and the set of complementary pitch classes are then assigned to the piano. This is shown in the upper two staves of Fig. 5-4. For musical flexibility, the process is not applied with absolute rigour, notes in each bar which are present in the string

parts but not treated as part of the string pitch field are shown as small notes in brackets²⁵.

The image displays a musical score for bars 32 through 37. The top system (bars 32-34) features a Piano part with 'Pitch Fields' and 'Strings' staves. The Piano part shows complex chordal structures with notes in brackets, labeled with numbers like [8], [9], [7], [4], and [5]. The Strings part shows a similar structure with notes in brackets labeled [3] and [5]. The bottom system (bars 35-37) features a Violin 1 & 2 Melody part and a Viola, Cello, Double Bass part. The Melody part shows a chromatic line with notes in brackets labeled [5], [7], and [7]. The Viola, Cello, Double Bass part shows a chromatic line with notes in brackets labeled [7], [5], and [5].

Figure 5-4. Partitioning of pitch classes between piano and strings (bars 32-37).

The idea of using different registers and instrumental timbres to separate the different partitions of the chromatic whole is taken from Lutosławski's work with twelve-note aggregates. The intention is to achieve "clear, characteristic sonorities, while maintaining a high level of chromatic density" (Rae 1999, p57).

5.5 Bridge Passage – Moderato Inquieto

The melodic section subsides into the bridge passage starting at Figure 'D'. Musically this is a fairly static passage anticipating the faster central section.

The change in mood and tempo is marked by the trumpet announcing the pitches of the Z cell in a fanfare-like motif in its low register. This is punctuated by a rhythmic motif on side-drum and strings (bars 47-49). Both of these motifs are used as significant material in the central section.

²⁵ The inclusion of the G in the piano part in bar 33 is the composer's mistake in the first version of the score. It is a dominant note in the melody and should be included in the string's pitch field, not the piano's. This will be revised for future performance.

With the exception of the trumpet fanfare, the pitch material is derived from various transpositions of the X cell, dominantly X_0 and X_6 . The rhythmic accompaniment to the trumpet is built using the pitches of X_0 (violin 1, viola, 'cello and bass) with additional pitches from X_6 on violin 2. This is followed by short rising phrases taken initially from X_0 (low strings) and then subsequently using transpositions and slightly expanded versions of X.

5.6 Central Section – Allegro Moderato

*Man turned to his mechanisms and made hideous
his works of art, his lead paintings, his wistful statues of wire,
:
... and of the hopes of many only a faint skeleton remained –
in the sky, the end of the century was paying what it owed us.*

The central section is faster, louder and more agitated than the outer two. From the fluid rhythms and vague shifting harmonies of the opening section, the music now moves towards a mechanical and brutal process inspired by the lines of the poem above. The section emerges from the bridge, however, the idea is of the onset and deepening of night suggested by the line "*My love, night came down, galloping over the spread of the world.*"

The primary tonal material is the Z tetrachord, presented first in the brass (letter 'F') before being picked up by strings and woodwind at the climactic point (Letter 'G'). Supporting and accompanying material is derived from the X cell in various transpositions and is presented primarily by the strings and woodwind.

The intention of the string and woodwind accompaniment is to create the feeling of restlessness and build towards the climax supporting the intermittent and increasingly strident statements of the primary Z material in the brass. As in the first section, the writing has quasi-aleatoric properties – each part is fully notated, but the overall effect creates a chaotic, but not entirely random, effect.

Rhythmically, continuous semi-quaver movement dominates the accompaniment. Pitch-wise, the use of the X tetrachord as a basis for the accompanying material results in mainly chromatic movement with the largest

interval in any part being no greater than a minor third. Together, these properties form the basis of the restlessness and tension.

A process of accumulation is used to build the climax – pitch, dynamics and the number of parts increase throughout the section. Starting pianissimo in the low strings, the section builds towards a fortissimo climax using the full orchestra. The basic phrase of the process is built up of 6 cells each derived from the primary X cell as shown in Fig. 5-5 below.

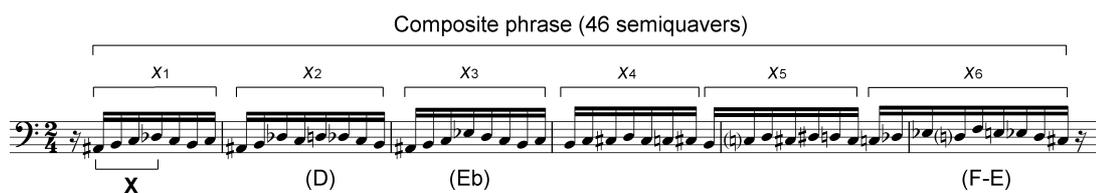


Figure 5-5. Main phrase of accumulation process.

The constituent cells are of irregular length (7, 8, 8, 7, 7, 9 semiquavers respectively) and form a composite phrase of 46 semiquavers (5 $\frac{3}{4}$ bars) in total. This irregularity is intended to create a chaotic feel in itself and, as more parts join the process, avoid regularity arising from the parts coinciding. The first cell, x_1 , comprises only pitches from X, whilst x_2 introduces the pitch D and x_3 uses both D and Eb. Cells x_4 and x_5 are a simple semitone transposition up of x_1 and x_2 (although x_5 is truncated by a semiquaver) and the final cell, x_6 , incorporates two further pitches E and F. The phrase thus rises over its length in a succession of smaller rising and falling phrases.

In practice, the underlying phrase is regularized a little in order to make it more practical to play in terms of performer orientation, breathing and bowing. Occasional short rests and quaver substitutions are made to the semiquaver pattern and strings are phrased in more regular groups of 4 and 8 semiquavers.

The accumulation process starts with the basic phrase in a low register on the 'cellos. Other parts then enter using a regular pattern of interval classes; the second entry (violas) is an augmented fourth above the cellos and the third

and fourth²⁶ entries at a minor third and major sixth respectively²⁷. Once the initial statement of the phrase has completed, it is repeated at successive transpositions each a major third above its previous statement. This cyclic pattern of entries and transpositions is symmetrical and spans all twelve pitch classes as shown in Fig. 5-6. Note that the pitch which is used to identify the phrase transposition is consistently taken to be the second note of the phrase (e.g., the phrase in Fig. 5-5 above, is taken to be at a pitch of B). This is because later inversions of the phrase are around the second note, so it is easier to represent both the inverted and non-inverted versions of the phrase with a single pitch.

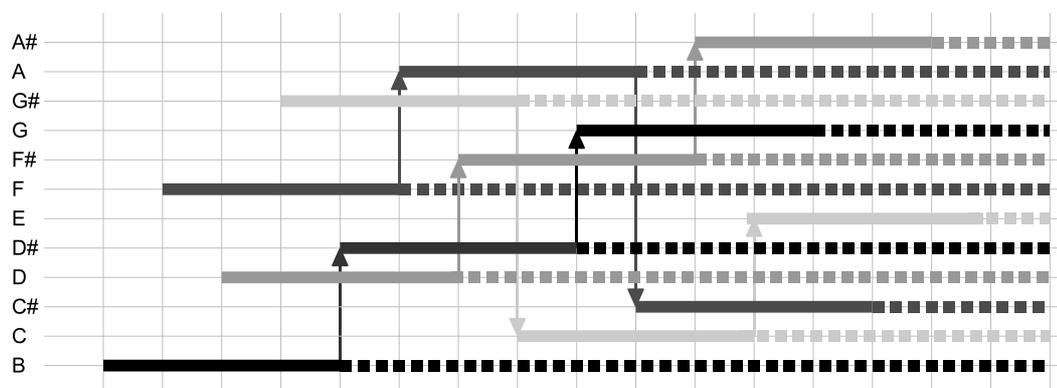


Figure 5-6. Pitch class coverage using a symmetrical cycle of intervals and transpositions.

Although the intervallic spacing of the phrases are highly symmetrical, the time spacing of the entries is deliberately erratic in order to heighten the aleatoric feel of the writing. The second entry starts $1\frac{1}{2}$ bars after the first but the third entry is delayed by two additional bars, starting $3\frac{1}{2}$ bars after the second. The fourth entry starts just over $5\frac{1}{2}$ bars (45 semiquavers) after the

²⁶ For the purposes of this analysis, the bass entry at bar 75 is ignored as it is simply an octave down from the opening viola statement (second entry) and is used to thicken the texture in the lower registers.

²⁷ Each phrase statement is generally assigned to a single part but for practical performance considerations, statements are sometimes split between two or more instrumental parts. For example, the third entry of the phrase is initially presented in Violin I before being passed to Violin II to allow the entry at bar 77 to be stated by Violin I. Similarly, Violin II allows a brief respite for the violas at bars 74-76.

third which, transposition aside, results in these two statements being in very close canon only a semiquaver apart. Fig. 5-7 below shows the timing and absolute pitch of the entries in the first part of the central section, figures 'E' to 'F'.

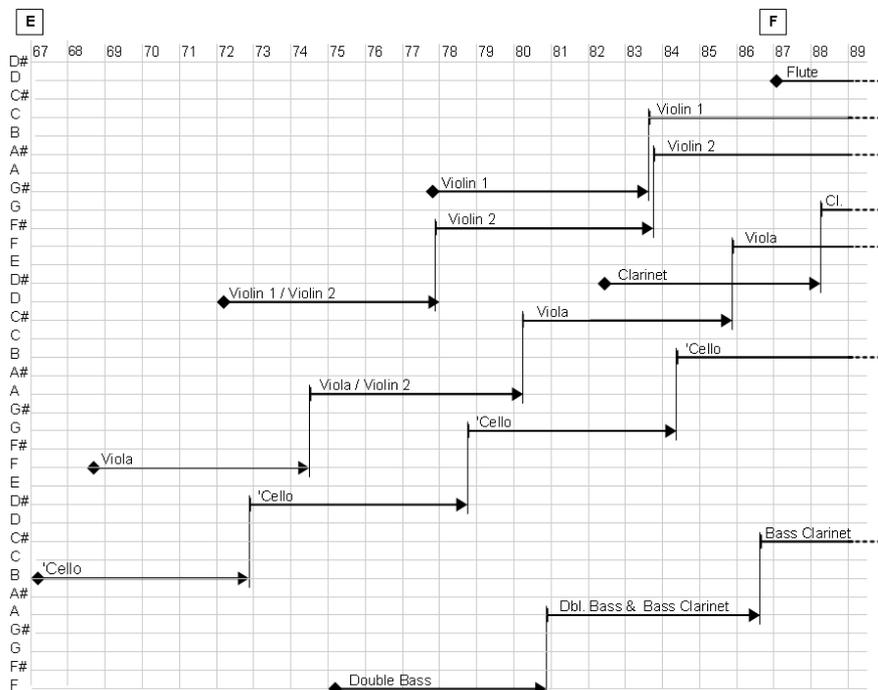


Figure 5-7. Pitch and time spacing of accompaniment phrase entries.

An additional entry in the basses an octave below the viola entry is used to thicken the texture in the lower registers. On its first transposition, it is doubled by the bass clarinet to prepare the entries for the remainder of the woodwind around figure 'F' (bars 82-93). The bass clarinet continues the phrase when the double bass changes to different material at 'F', however, the remainder of the woodwind enter at times independent of the ongoing string phrases and start using pitch classes D# (clarinet), D (flute) and G# (piccolo) outlining three of the constituent pitch classes in the Z tetrachord.

At figure 'F' the trumpet makes the first announcement of the Z tetrachord using a fanfare like rhythm. This entry is similar to its earlier statement in the bridge passage but now *forte* and up an octave in the much brighter part of the trumpet's higher register. This is answered by the horn and trombone outlining in a simple rhythm the same 4 pitches in different permutations (bars

94-98). A similar process is repeated in bars 99-107 but with the brass rising a tone and subsequently continuing to rise to the climax point at figure 'G' (bar 114).

Between figures 'F' and 'G' the higher strings and woodwind continue the process started at 'E' but the lower strings and bass clarinet drop out just after 'F' and outline another permutation of the pitches in the Z tetrachord (bars 98-105). The percussion develop the simple rhythmic motif announced at the end of the first section and entry into bridge passage. In the final approach to the climax point the strings drop to a low pedal chord based around the Z_3 cell²⁸. (C-F-F[#]-B,).

The climax point is a rigid, mechanistic process rotating the four pitches of the Z cell in four-part canon. Firstly stated on strings playing *fff* in crotchet rhythm, it is then added to by woodwind at half-speed in syncopated minims and then finally joined by the brass with another halving of speed. Energy is rapidly dissipated, pitch and dynamic falling off to simple piano annunciation of timpani outlining the basic F/B axis with other colour pitch D.

5.7 Final Section – Moderato Tranquillo

*It is time, love, to break off that somber rose,
shut up the stars and bury the ash in the earth;
and, in the rising of the light, wake with those who awoke
or go on in the dream, reaching the other shore of the sea
which has no other shore.*

This final section returns to the same tempo of the opening. However, the music is more static than the first section and the mood reflective.

Musically, the final section is a simple unadorned presentation of the principal material. It starts with an unaccompanied statement of the melody in canon on piccolo and alto flute. This provides a period of repose after the climax and serves as a bridge into the final chordal passage of the ending. The presentation of the canon is similar to its earlier appearance in the strings but

²⁸ Denoting Z (A-D-E^b-A^b) as Z_0 , then Z_3 comprises pitch classes C-F-F[#]-B. Only pitches C-F-B are used in the strings bars 107-113.

the answering melody on the piccolo is now above the main theme on the alto flute and there are some minor changes to phrasing and articulation. The instruments are chosen for their evocative and slightly primitive character, each being placed in its characteristic register. The wide spacing between the two parts is intended to create a feeling of emptiness and reflection and is reminiscent of the sparse and widely spaced instrumentation often found at the end of the first movement of a Shostakovich symphony.

The final slow sequence of chords outlines the three tetrachords (Fig. 5-8). It starts in the strings with a widely spaced chord comprising the X_0 pitch classes. The parts then move one by one to the pitch classes of Z and then on to those of X_6 . The woodwind and brass pick out various notes of the string parts and also echo fragments of the opening by the use of the interval of the sixth. The wind and brass, however, converge on the pitch classes of X_0 and, with the addition of the $G\#$ (A_b) colour note in the alto flute, the piece comes to rest on a 9-note aggregate.

The figure shows a musical score for three measures. The first measure is labeled X_0 and features notes in Vln. I, Vln. II, Vla, and Vc, Cb. The second measure is labeled Z and features notes in Vln. I, Vln. II, Vla, and Vc, Cb. The third measure is labeled $X_6 (X_0)$ and features notes in Picc, A Fl, Tpt, Cl, Flt, and Tbn, B. Cl. Below the score, arrows indicate the progression from X_0 to Z to $X_6 (X_0)$.

Figure 5-8. Harmonic framework of final section.

From the opening bars of the first section, the journey has been from the natural world of the jungle at night, through a mechanical and brutal process of the man-made world, to a final position of calm and acceptance. As well as being a musical recapitulation, the final section attempts to sum up the whole feeling of the poem evoked by the last stanza of the poem (quoted in full at the head of this section) "...and, in the rising of the light, wake with those who awoke or go on in the dream, reaching the other shore of the sea which has no other shore".

6 Conclusion

This dissertation has described the portfolio compositions with particular reference to the way in which poetry and symmetrical pitch structures have shaped the pieces. The symmetrical structures are readily identified by objective analysis; the role of poetry is more subjective yet equally important and, in many ways, more fundamental since it can help integrate both the spontaneous impulses and analytical processes of the composer.

Viewed chronologically, two threads of development can be seen in the pieces. From *Sick Leave*, the first to be composed, through the *Sextet* and *Horn Quintet* culminating in *Fragments*, there is an increased abstraction and use of formal symmetry. On the other hand, from the same starting point, *The Sunlight on the Garden*, *Impromptu*, *Rêverie* and *Impressions* trace a more intuitive strand of composition based on poetry and inner imagery. Of course, both aspects are present to some degree in all of the pieces and, in the view of the composer, the relatively early *The Sunlight on the Garden* achieves a good balance between 'heart and head' with its large scale plan of symmetric tonal centres underlying an intuitive setting of MacNeice's poem. The piece can be seen as a branching point of the two strands of the composer's development with the analytic and intuitive aspects of composition being pursued independently for a period of time. The *Nocturne* was a deliberate attempt to reunite the two approaches in a single piece, to try and bring into one the key ideas developed in earlier pieces. Here a specific poem is used as the unifying force, but the poem itself is never explicitly stated; symmetric constructs at both the local and large-scale are used, but the piece was, on the whole, intuitively composed. As for the poem, the symmetric constructs are more in the background, their effect is primarily on the composer.

Looking in more detail at the way formal symmetries have been used, further threads of development can be identified. Where symmetrically located tonal centres have been used to define large-scale form, there has been a move from the bipolar structure of *The Sunlight on the Garden* to the multiple centres of the *Horn Quintet* and *Fragments* and, with *Nocturne*, a more integrated approach based on the tetrachords of a symmetrically partitioned

tone row. Although *The Sunlight on the Garden* and *Nocturne* both use local level symmetries that reflect the larger scale structure, those in *Nocturne* are more far reaching in that the underlying row shapes the vertical harmony by defining pitch aggregates as well as local horizontal phrases. This might be seen as an example of a more general development of trying to integrate the horizontal and vertical aspects of composition. In the earlier portfolio pieces there can be a sense of 'melody plus harmony' where both aspects are considered but are treated somewhat independently. With the more abstract pieces, counterpoint is developed with vertical harmonies arising as a consequence of the horizontal line; the intuitive pieces, on the other hand, are more harmonically driven with melody often arising from the underlying harmonies. *Nocturne* again tries to bring these aspects together so that both the melody and harmony come from a single source.

With regard to more local pitch symmetries, there has been a move away from a very literal usage of the equal division of the octave (for example, the cyclic pattern of major thirds in the bass line of the *Sextet Loure*) to a freer interpretation where various transpositions are used to space pitch material across the octave without being too rigid about logical exactness. The small-scale vertical symmetries also illustrate the general trend from the more rigorous patterns used in parts of *The Sunlight on the Garden* to the more suggestive one in *Impromptu*; maybe a reflection in water rather than glass. In a similar way, a clear development can be seen in the quasi-aleatoric passages first used at the end of the *Sextet Scherzo* (bars 127-140) and subsequently in the *Horn Quintet* (bars 84-102) and finally forming a major part of the central section of *Nocturne* (bars 67-113). All of these passages are based on small chromatic cells repeated at different transpositions, typically a major a third apart, which are then superimposed on one another as each successive part enters. In *Nocturne*, the process is the most developed with the transpositions of different parts chosen to give complete chromatic coverage (Fig. 5-6) and the more substantial section is sustained by using inversions and variations of the basic phrase.

As the portfolio developed, the composer has become increasingly aware of the importance of intuition in composition; an increased appreciation of the need to let the music speak and of the need for balance between the explicit and implicit. Technique must be developed and used, but ultimately needs to serve the musical ends. For the composer, poetry has been the primary source of this insight and an active part of the compositional process. Yet it is realized that this itself is only a pointer, providing "irrational doorways" through which "the wildness and the pang of life" may be glimpsed²⁹ and that music itself is such a language and provides its own unique means of communication.

This evolution is manifest in the portfolio by the shift from abstraction to intuition and in the move from explicit settings of poetry to the more personal inner imagery. The effect on the composer as important as ever, but now more an internal process than visible surface. The general relaxation of the formal symmetries also follows this development and is perceived not as a loss of musical rigour but as an increased assimilation of compositional technique in the musical whole. Another example of integration of technique can be heard in the use of dissonance, those in the climax of *Nocturne*, for example, are more extreme than any found in the earlier pieces yet are used as part of the musical narrative, not simply as an 'effect'; overall the gradation of dissonance is more controlled throughout the piece than in some of the earlier compositions. The use of dissonance also mirrors the contrasts throughout the portfolio of chromaticism and diatonicism, and of dense contrapuntal textures with more static open passages, solos and recitatives.

The composer's own musical development throughout the portfolio has explored several different paths although, as Goehr says, a composer "knows in his heart of hearts that an abundance of factors comes into play when a piece is made, and that the final form in which he delivers it generally falls far short of its original aspirations; consequently, he may feel that expository talk

²⁹ William James, quoted in Copland 1952, p66. Originally from James's *The Varieties of Religious Experience: a Study in Human Nature* (1902).

always disguises the work and helps to form distorted impressions" (Goehr 1998, p58). However, the experiences of composition always provide new insights and material for future pieces. It is the composer's hope to carry on developing the approach described in this dissertation; of listening to the spontaneous unbidden inner impulses, of improving technique whilst integrating it in the greater musical whole and of shaping the final composition by the inner poetic imagery, seeking a personal and communicative musical language.

References

- Antokoletz, E. (1984).** *The Music of Béla Bartók*. London: University of California Press.
- Antokoletz, E. (1993).** 'Middle Period Quartets'. In Gillies, M. (Ed), *The Bartók Companion*. pp. 257-277. London: Faber and Faber.
- Barenboim, D. (2009).** *Everything is Connected: The Power of Music*. London: Phoenix.
- Bartók, B. (1920).** 'The Problem of the New Music'. In Suchoff, B. (Ed) 1976, *Béla Bartók Essays*, pp455-459. London: Faber & Faber.
- ____ (1937). 'Structure of Music for String Instruments'. In Suchoff, B. (Ed) 1976, *Béla Bartók Essays*, p416. London: Faber & Faber.
- Brown, D. (1982).** *Tchaikovsky: A Biographical and Critical Study. Volume II, The Crisis Years (1874-1878)*. Southampton: Camelot Press.
- Copland, A. (1952).** *Music and Imagination*. Cambridge, MA: Harvard University Press (6th printing 1972).
- Davismoon, S., Eccles, J. (2010).** 'Combining Musical Constraints with Markov Transition Probabilities to Improve the Generation of Creative Musical Structures'. In Di Chio *et al* (Eds), *Applications of Evolutionary Computation*. LNCS 6025, pp. 361-370.
- Dickinson, P. (2003).** *The Music of Lennox Berkeley*. Second edition (first published 1998). Woodbridge, UK: Boydell Press.
- Drew, E. (1950).** *T. S. Eliot: The Design of His Poetry*. London: Eyre & Spottiswoode.
- Dutilleux, H. (2003).** *Henri Dutilleux: Music – Mystery and Memory, Conversations with Claude Glayman*, trans Roger Nichols. Aldershot, UK: Ashgate. First published in French by Actes Sud 1997.
- Eliot, T. S. (1959).** *Four Quartets*. Second edition (first published 1944). London: Faber and Faber.
- Foster, C. (1999).** 'Ideas and Imagination: Schopenhauer on the Proper Foundation of Art'. In Janaway, C. (Ed), *The Cambridge Companion to Schopenhauer*. Cambridge, UK: Cambridge University Press.
- Gillies, M. (Ed), (1993).** *The Bartók Companion*. London: Faber and Faber.
- Goehr, A. (1998).** *Finding the Key: Selected Writings of Alexander Goehr*. Derrick Puffett (ed). London: Faber and Faber.
- Headlam, D. (2008).** 'Atonality: Theoretical Issues (Section 4)'. In Lansky, P., *et al*, 'Atonality'. *Grove Music Online*. Retrieved 06 May, 2008 from: www.grovemusic.com/shared/views/article.html?section=music.47354.4
- Headlam, D. (2010).** 'Atonality: Theoretical Issues (Section 4)'. In Lansky, P., *et al*, 'Atonality'. *Grove Music Online. Oxford Music Online*. Retrieved 22 March, 2010 from: www.oxfordmusiconline.com/subscribe/article/grove/music/47354

- Henze, H. W. (1982).** *Music and Politics: Collected Writings 1953-81*. Peter Labanyi (trans). London: Faber and Faber.
- ____ (1959). 'The Message of Music'. *Ibid.*, pp 84-92.
- ____ (1960). 'Der Prinz von Homburg', *Ibid.*, pp 100-105.
- ____ (1963a). 'Music as a Means of Resistance', *Ibid.*, pp 122-129.
- ____ (1963b). 'Instrumental Composition', *Ibid.*, pp 130-133.
- Henze, H. W. (2001).** *Memoirs of an Outsider*. Film directed by Barrie Gavin. Germany: Hessischer Rundfunk / RM Associates.
- Jung, C. G. (1991).** *Psychological Types*. Collected Works vol. 6 (translated by H. G. Baynes, revised by R. F. C. Hull). London: Routledge.
- Knussen, O. (1996).** Interview with Hans Werner Henze, in sleeve notes of *Henze Symphonies 1-6*. Deutsche Grammophon / Decca.
- Krznaric, R. (2011).** *The Wonder Box: Curious Histories of How to Live*. London: Profile Books.
- Leafstedt, C. S. (1999).** *Inside Bluebeard's Castle: Music and Drama in Béla Bartók's Opera*. Oxford: Oxford University Press.
- Lendvai, E. (1971).** *Béla Bartók – An Analysis of his Music*. London: Kahn & Averill (revised edition, 1979).
- Lendvai, E. (1999).** *Bartók's Style*. Budapest: Akkford Music Publishers.
- Ligeti, G. (1983).** *Ligeti in Conversation*. London: Eulenburg.
- Lutosławski, W. (1962).** 'On Beauty, Musical Form, Compositional Technique, and Perception'. In Skowron, Z. (Ed), (2007). *Lutosławski on Music*. Plymouth: Scarecrow Press.
- MacDonald, M. (2008).** *Schoenberg*. Oxford: Oxford University Press.
- MacNeice, L. (2005).** 'The Sunlight on the Garden'. In *Louis MacNeice: Poems Selected by Michael Longley* (2nd edition, first published 2001) London: Faber & Faber.
- McGilchrist, I. (2009).** *The Master and his Emissary: the Divided Brain and the Making of the Modern World*. New Haven and London: Yale University Press.
- Neruda, P. (1967).** 'The Watersong Ends', (*La barcarola termina*, translated by Alastair Reid). In Tarn, N. (Ed), (1975), *Pablo Neruda: Selected Poems*, pp. 233-237. Penguin Books.
- Ott, E. (1993).** *Chaos in Dynamical Systems*. Cambridge: Cambridge University Press.
- Palmer-Füchsel, V. (2010).** 'Hans Werner Henze'. In *Grove Music Online*. *Oxford Music Online*. Retrieved January 23, 2010 from: <http://www.oxfordmusiconline.com/subscribe/article/grove/music/12820>

- Perle, G. (1955).** 'Symmetrical Formations in the String Quartets of Béla Bartók'. In *The Right Notes: Twenty-three selected Essays by George Perle on Twentieth Century Music*, pp. 187-205. Stuyvesant, NY: Pendragon Press (1995). Originally published in *The Music Review*, vol. 16, no. 4 (November 1955), pp. 300-312.
- Rae, C. B. (1999).** *The Music of Lutosławski*, London: Omnibus Press (3rd edition, first published in 1994 by Faber & Faber).
- Rautavaara, E. (2000).** *Einojuhani Rautavaara in conversation with Vladimír Ashkenazy*, track 7 on ONDINE audio CD ODE 950-2, 2000. Page numbers refer to sleeve notes from same recording.
- Rautavaara, E. (2008).** *Einojuhani Rautavaara in conversation with Donald Macleod*, broadcast on BBC Radio 3, 4th October 2008.
- Sassoon, S. (1999).** *The War Poems*. London: Faber & Faber (paperback edition, first published 1983).
- Schoenberg, A. (1923).** 'Twelve-Tone Composition'. In Leonard Stein (Ed) & Leo Black (trans), (1975), *Style and Idea: Selected Writings of Arnold Schoenberg*, pp. 207-208. London: Faber & Faber.
- _____ (1937). 'How One Becomes Lonely'. In Leonard Stein (Ed) & Leo Black (trans), (1975), *Style and Idea: Selected Writings of Arnold Schoenberg*, pp. 30-53. London: Faber & Faber.
- _____ (1941). 'Composition with Twelve Tones (1)'. In Leonard Stein (Ed) & Leo Black (trans), (1975), *Style and Idea: Selected Writings of Arnold Schoenberg*, pp. 214-245. London: Faber & Faber.
- _____ (1946). 'Heart and Brain in Music'. In Leonard Stein (Ed) & Leo Black (trans), (1975), *Style and Idea: Selected Writings of Arnold Schoenberg*, pp. 53-76. London: Faber & Faber.
- _____ (1967). *Fundamentals of Musical Composition*, Strang, G., & Stein, L. (Eds). London: Faber & Faber.
- Schulz, T. (2008).** 'An invocation of Beauty', in sleeve notes to recording of *Nachtstücke und Arien*, Phoenix Music Media.
- Steinitz, R. (2003).** *Györgi Ligeti: Music of the Imagination*. London: Faber and Faber.
- Stevens, H. (1993).** *The Life and Music of Béla Bartók* (3rd edition prepared by Malcolm Gillies). Oxford: Clarendon Press.
- Thayer, (1964).** *Thayer's Life of Beethoven*. (revised and edited by Forbes, E.). Princeton, New Jersey: Princeton University Press

Bibliography

This bibliography list books and sources that have generally informed the author during the composition of the portfolio and preparation of the dissertation but not directly quoted. It also includes collected works and writings from which specific chapter citations have been made (e.g., *Béla Bartók Essays*) and individually included in the main references.

- Babbitt, M. (1949).** 'The String Quartets of Bartók'. *The Musical Quarterly*, vol. 35, no. 3, pp. 377-385.
- Bayley, A (Ed) (2001).** *The Cambridge Companion to Bartók*, Cambridge University Press.
- Dickinson, P. (2003).** *The Music of Lennox Berkeley*. Second edition (first published 1998). Woodbridge, UK: Boydell Press.
- Gillies, M. (Ed), (1993).** *The Bartók Companion*. London: Faber and Faber.
- Leibowitz, R. (1970).** *Schoenberg and his School*. Dika Newlin (trans). New York: Da Capo Press. (unabridged republication of first edition published in New York, 1948)
- Rickards, G. (1995).** *Hindemith, Hartmann and Henze*, London: Phaidon Press.
- Roig-Francoli, M. A. (2008)** *Understanding Post-Tonal Music*. New York: McGraw-Hill.
- Rosen, C. (1980)** *Sonata Forms*. New York, London: W. W. Norton & Company.
- Samson, J. (1993).** *Music in Transition: a Study of Tonal Expansion and Atonality, 1900-1920*. London: J M Dent (paperback edition, first published 1977).
- Skowron, Z. (Ed), (2007).** *Lutosławski on Music*. Edited and translated by Zbigniew Skowron. Plymouth: Scarecrow Press.
- Stein, L. (Ed), (1975).** *Style and Idea: Selected Writings of Arnold Schoenberg*. Leo Black (trans). London: Faber & Faber.
- Suchoff, B. (Ed), (1976).** *Béla Bartók Essays*. London: Faber & Faber.
- Whittall, A. (1999).** *Musical Composition in the Twentieth Century*. Oxford: Oxford University Press.
- Whittall, A. (2008).** *Serialism*. Cambridge: Cambridge University Press.
- Wilson, P. (1992).** *The Music of Béla Bartók*. London: Yale University Press.

Appendix I

Portfolio Compositions

This is a list of compositions within the portfolio. All scores are presented in a separate folder.

Title	Ensemble	Performances
Sick Leave	String quartet & tenor	18-Feb-07: St Giles Edinburgh Quartet / Joe Earley
Sextet	2 flutes, clarinet, violin, viola, cello	May-07: Napier lunchtime concert Contemporary Music Ensemble
The Sunlight on the Garden	Mezzo Soprano, flute, clarinet, horn, cello, piano	06-Oct-07: Research Ensemble
Horn Quintet	String quartet & french horn	24-Feb-08: St Giles, Edinburgh Quartet / Jen McKay
Impromptu	Piano	07-May-08: Napier, Hannah Ross 27-Sep-08: Sonic Fusion Festival, HR
Rêverie	Clarinet & piano	30-May-08: Stockbridge Parish Church, Alex South, Lauryna Sableviciute May 2009: Stockbridge Parish Church
Fragments	String quartet	01-Mar-2009: St Giles, Edinburgh Quartet
Impressions	Violin, french horn & piano	26-Feb-2010: Peninsula Contemporary Arts Festival, Research Ensemble
Nocturne	Chamber Orchestra	17-Feb-2010: Stockbridge Parish Church Napier Chamber Orchestra, conductor Kenneth Dempster
Prelude	Full orchestra	N/A

Appendix II

Lorenz Equations used in *Impressions*

The chord sequence used as the basis for *Impressions* was generated from equations of the Lorenz attractor (Ott 1993, p58). These are

$$\begin{aligned}\frac{dx}{dt} &= -\tilde{\sigma}x + \tilde{\sigma}y \\ \frac{dy}{dt} &= -xz + \tilde{r}z - y \\ \frac{dz}{dt} &= xy + \tilde{b}z\end{aligned}$$

Solutions of these equations describe a trajectory through three-dimensional space. Any point in the space can be mapped to a set of 3 discrete pitches of the chromatic scale (i.e., a triad) by a linear transformation of the form $x' = mx + c$ followed by quantization to the nearest integer value. For convenience, MIDI note numbers are used to represent pitches with middle C denoted by the number 60, the C \sharp immediately above by 61, and so on.

By taking samples along a solution trajectory, a sequence of points (x_i, y_i, z_i) , and hence a set of triads, may be obtained. For the sequence of triads used in *Impressions* an approximate solution was obtained by the iteration:

$$\begin{aligned}x_{i+1} &= x_i + \Delta t(-\tilde{\sigma}x_i + \tilde{\sigma}y_i) \\ y_{i+1} &= y_i + \Delta t(-x_i z_i + \tilde{r}x_i - y_i) \\ z_{i+1} &= z_i + \Delta t(x_i y_i + \tilde{b}z_i)\end{aligned}$$

using initial conditions of $x_0 = 1, y_0 = 1, z_0 = 1$, an integration step of $\Delta t = 0.02$ and Lorenz's original parameter values $\tilde{\sigma} = 10, \tilde{r} = 28, \tilde{b} = 8/3$.

The pitches were obtained using an offset $c = 67$ and scaling of one ($m = 1$). This maps the first point (1,1,1) to pitch A $_5$ and keeps all successive pitches within the MIDI range of [0,127]. Because of the relatively small value for Δt (needed for numerical stability during the iteration procedure) only every fifth iteration point was used to generate a pitch. This raw set of pitches was then treated as a set of pitch classes used to form the actual triads shown in Fig. 4-6 of Chapter 4. The composer felt free to transpose the generated pitches up

and down by an arbitrary number of octaves, although the overall rise and fall of the raw pitches was used to shape the contour of final triad sequence.

Many people read about music instead of listening to it; this may be pleasurable, but it is not the same thing, and does not necessarily always further their understanding of music.

Hans Werner Henze