
Serial metamorphoses in the music of Roberto Gerhard

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ABSTRACT

For Roberto Gerhard the 'simple spelling of the twelve-tone series forwards and backwards in the correct order' was 'too much like copying the flower of my wallpaper pattern'. [1] He believed 'there will probably always be as many different ways of handling the twelve-note technique as there are original composers who use it, possibly even more'. [2] This evolution of the technique started with Schoenberg (in *Von Heute Auf Morgen*) and the unorthodox was the path Gerhard pursued with respect to serialism. In brief, Gerhard split his tone rows into two hexachords and the pitches within these were allowed to be freely permuted. The retention of a discrete interval content within each hexachord created a degree of coherence but arguably the lack of an ordering of the pitches compromised the inherent structure which serial technique can provide. Gerhard recognized this and realised that other micro and macrocosmic structural planes were required. It is within his symphonies and *Concerto for Orchestra* that Gerhard displays virtuosity in compositional technique in order to resolve the structural issues in his evolved serial method. It is Gerhard's solutions to the microcosmic plane which this paper aims to investigate and they reveal a great deal about the manner in which Gerhard conceived sound.

1. INTRODUCTION

For composers such as Roberto Gerhard who chose to ignore fixed order serialism in favour of a permutational technique, additional methods of controlling pitch material on a small and large scale were necessary. Gerhard's use of such methods demonstrated a concern with temporality in sound; he created sound images which occupy their own musical space and exist complete in themselves. The textures generated produce a complex dynamic inner frame contained within a static outer frame which reveal affinities with Varèse's music:

Intégrales was conceived for a spatial projection. I constructed the work to employ certain acoustical means which did not yet exist, but which I knew could be realized and would be used sooner or later.... Whereas in our musical systems we divide up quantities whose values are fixed, in the realization I wanted, the values would have been continually changing in relation to a constant. In other words, it would have been like a series of variations, the changes resulting from slight alterations of a function's form or from the transposition of one function to another. In order to make myself better understood – for the eye is quicker and more disciplined than the ear – let us transfer this conception into the visual sphere and consider the changing projection of a geometrical figure onto a plane surface, with both geometrical figure and plane surface moving in space, but each at its own changing and varying speeds of lateral movement and rotation. The form of the projection at any given instant is determined by the relative orientation of the figure and the surface at that instant. But by allowing both figure and surface to have their own movements, one is able to represent with that projection an apparently unpredictable image of a high degree of complexity; moreover, these qualities can be increased subsequently by permitting the form of the geometrical figure to vary as well as its speed...[3]

This paper concentrates on three processes developed by Gerhard to organize pitch, which impact on the melodic, harmonic, textural and temporal features of the music: 'self-harmonising melody'; 'time-lattices'; and chord rotation.

Figure 3. *Symphony no. 3, 'Collages', b.29.*

The pitches of the melodic idea (Pa11), distributed between strings and harp, are articulated once. Rather than each articulation being sustained by the instrument that first plays them (as in previous examples) they are doubled and then repeated by the woodwind and brass instruments. Each part of this lattice consists of a repeated pitch and a constant duration independent of the other parts. For instance: the clarinets sustain an E for sixteen quaver beats before rearticulating the pitch; the bassoons articulate a D sharp every thirty-two quaver beats. This creates a constantly evolving mesh of sound.

Some of the most idiosyncratic sounds of Gerhard's music are 'unpitched' and this emphasises further the textural significance of the time-lattice where 'temporal configuration is playing solo':

Pitch is merely subsidiary here and, therefore, free use is made of a number of sounds of indeterminate pitch obtainable on some instruments by unorthodox ways of playing them. [5]

These are perhaps not as unorthodox any more - *col legno*, *pizzicato* below the bridge, *col legno* on the tail piece, *col legno* strike chin rest. At bar 603 of the *Concerto for Orchestra*, a time-lattice combining such effects with unpitched percussion is the principal 'solo' feature for some twenty-two bars, at which point it is relegated to an accompaniment function when the woodwind and brass enter with more significant pitched material. In an earlier example (bar 101), the unpitched percussion and pitched instruments are differentiated less, working together texturally. The strings state Pa3 in the form of a time-lattice (the individual pitches having characteristic attacks and dynamics as described in connection with single-note motifs) while the harp presents pitch sets of four notes – (E, F#, Bb, D#) followed by (Eb, E, F, Bb). Individually these groups of notes do not give any real indication as to which hexachord (if any) they belong. However, if the two sets are combined they create the set [3, 4, 5, 6, 10], which is Pb3 with its D omitted.

4. CHORD ROTATION

Chord rotation, like time-lattices and self-harmonising melody, has a static/dynamic quality – the harmony (or progression) remaining constant (or with minimal change) while the position of the pitches within the chord are reordered. The following pitch-integer diagram representing b.94 of the second movement of the *Symphony no. 1* (1952-53), illustrates this:

Vln 1	7	2	6	0	5	1	11	8	
Vln 2	1	11	5	8	2	0	6	7	
Vla	0	6	2	7	11	8	5	1	
Vc	8	5	11	1	6	7	2	0	

Figure 4. *Symphony no. 1*, 2nd Movement, b.94.

Two chords, [7, 1, 0, 8] and [2, 11, 6, 5] are rotated so that each time the chord appears it has a different vertical ordering. A more sophisticated example of this can be found a few bars later in this movement:

Vln 1	0	6	10	4	11	2	6	10	1	4
	2	9	1	8	0	5	9	1	4	0
Vln 2	5	2	6	0	4	11	2	6	8	11
	11	5	9	10	8	0	5	9	10	8
Vla	1	11	2	6	10	1	8	11	5	9
	8	8	11	2	6	8	11	0	9	6
Vc	4	4	5	9	1	4	4	5	2	1
	10	0	0	5	9	10	0	2	6	10

Figure 5. *Symphony no. 1*, 2nd Movement, b.108. The **bold** pitch (0) in the 4th chord shows a discrepancy in the structure - it should be a C sharp (1). However, this could be a printing error in the score.

The rotational technique used here is quite different from the previous example. In Figure 5, the chords are rotated in two planes: horizontally and vertically. In the horizontal plane, the first five chords are either repeated or rotated in the second five chords (as shown by the brackets at the bottom of the diagram). In the vertical plane, the first chord of the violins is rotated to create the third chord of the violas and cellos, the second chord of the violins is rotated to make the fourth chord of the violas and cellos and so on (as illustrated by the diagonal lines running between the pairs of instruments). There is also an internal structure connecting the chords together, as is illustrated in the harmonic sequence of the violins: every consecutive chord retains two notes of the chord preceding it.

The rotational technique becomes more apparent later in the third movement of the same symphony where only one harmony is used at a time but with an equally systematic method:

		Pb1					Pa1						
Vin 1		0	9	10	1	6	2	3	7	11	8	4	5
		10	1	6	2	0	9	11	8	4	5	3	7
Vin 2		6	2	0	9	10	1	4	5	3	7	11	8
		9	10	1	6	2	0	7	11	8	4	5	3
Vla		1	6	2	0	9	10	8	4	5	3	7	11
Vc		2	0	9	10	1	6	5	3	7	11	8	4

Figure 6. *Symphony no. 1*, 3rd Movement, b.470. It is worth noting that the tone row used in the third movement is different from that of the first two movements.

In this passage, every harmony contains all six notes of its respective hexachord without duplication and they are spaced differently in each chord, achieved by canonic means. The initial linear statement Pb1 [0, 9, 10, 1, 6, 2] is used in every line in a displaced form. For example, the cello part begins with the last note of the first violin line and then continues with the initial statement - [2, 0, 9, 10, 1, 6].

In the second movement of the *Symphony no. 1* there is a distinctive theme consisting of an ascending fast semiquaver texture which holds the movement together; this thematic idea is organised using chord rotation:

		a	b	c	d	e	f			a	b	c	d	e	f			a	b	c	d	e	f			a	b	c	d	e	f
Vin 1	Ia8	2	3	6	11	0	1	↙	Ib8	4	5	7	8	9	10	↘	Ia8	11	0	1	2	3	6	↙	Ib8	7	8	9	10	4	5
Vin 2	Ib8	7	8	9	10	4	5	↘	Ia8	2	3	6	11	0	1	↙	Ib8	4	5	7	8	9	10	↘	Ia8	11	0	1	2	3	6
Vc 1	Ia8	11	0	1	2	3	6	↙	Ib8	7	8	9	10	4	5	↘	Ia8	2	3	6	11	0	1	↙	Ib8	4	5	7	8	9	10
Vc 2	Ib8	4	5	7	8	9	10	↘	Ia8	11	0	1	2	3	6	↙	Ib8	7	8	9	10	4	5	↘	Ia8	2	3	6	11	0	1

Figure 7. *Symphony no. 1*, 2nd Movement, b.136.

Two complementary hexachords (Ia8 and Ib8) are presented linearly. Each is doubled by horizontal rotations of themselves: for statements of Ia8 the first three notes [2, 3, 6, 11, 0, 1] are added to the end to create [11, 0, 1, 2, 3, 6]; for statements of Ib8 the hexachord is split by the ratio 4:2 for example, the first four notes [7, 8, 9, 10, 4, 5] are added to the end to create [4, 5, 7, 8, 9, 10]. These linear statements are then passed between the four parts in a canonical fashion as illustrated by the arrows between the six chord groups. Owing to this canon, every seventh harmony has the same pitch content but in a rotated form as revealed by the letters above the chords.

Despite the freedom with which Gerhard executes permutations of the row there is naturally always an original fixed order – that of its first presentation. What becomes more apparent through Gerhard's symphonies is the structural significance of this original ordering. In the *Symphony no. 2* (1957-59):

there are three structural methods, which can be summarised from 'Developments in twelve-tone technique' [6], that employ the series (or its derivative 'time-set'): to fix the length of the rhythmic articulation of individual pitches; to control the ordering of the twelve transpositions of a series so each is presented once before a transposition is repeated; finally, to determine the duration of these transpositions. [7]

This degree of organisation was not employed beyond this symphony and even this was deconstructed with Gerhard's revision of this work into *Metamorphoses* (1967-68). However, the original consecutive fixed order of the series was given an elevated position over other permutations:

from the standpoint of the permutational treatment, the original consecutive order of the series

(as in the first germinative idea or as adopted after adjustments) can be allowed a privileged position as thematically significant, and can be used as Schoenberg says, in the manner of a motif. [8]

In the *Symphony no. 3, 'Collages'* this 'significance' can again be seen where the consecutive order of the row assumes a function for the macro-organisation of the rotational microstructures. In the next example, Gerhard instigates the gradual transformation of one harmonic representation of a hexachord to another. The progression commences with Pa9 in the first chord. With each ensuing harmony one new pitch is introduced, gradually changing Pa9 into Pb9 (indicated in bold in the second violin 2 part). These 'new notes' are added in the original fixed order of Pb9:

	Pa9						Pb9					
Vln 1	2	1	10	0	7	11	8	9	3	6	4	5
	7	11	8	9	3	6	4	5	2	1	10	0
Vln 2	0	7	11	8	9	3	6	4	5	2	1	10
	11	8	9	3	6	4	5	2	1	10	0	7
Vla	10	0	7	11	8	9	3	6	4	5	2	1
Vc	1	10	0	7	11	8	9	3	6	4	5	2

Figure 8. *Symphony no. 3, 'Collages', b.395.*

Once again a canonic technique is apparent ensuring that no note is repeated in any harmony.

Some three bars later there is a more sophisticated chord rotation which spans thirteen bars: This example does not use canon but, like the last example, employs the original fixed order of the series to structure the pitch changes in the rotation in order to facilitate the gradual transformation from one hexachord to another. Figure 9 demonstrates the subtle serial metamorphoses which take place in this progression.

The progression begins with Ia10 (chord 1) which transforms into Ib10 (chord 7, except the Bb should be an A) by changing its set of notes in the order [9, 8, 2, 11, 1, 0] (shaded in Figure 9), this is the original consecutive order of Ib10. The chord of Ib10 then undergoes a similar process, changing notes in the original consecutive order of Ia10 [3, 4, 7, 5, 10, 6] but suddenly shifting at chord 13 (changing three notes) in order to convert into Pb9. The same system is applied to move to Pa9 (chord 19) following the original retrograde consecutive order of Pa9 [11, 7, 0, 10, 1, 2] and from Pa9 (up to chord 24) following the original retrograde consecutive order of Pb9 [5, 4, 6, 3, 9] with the last note (Ab [8]) omitted. Further serial associations can be found within this progression which exploit close relationships between differing transpositions of Prime and Inverted hexachords. For example altering one note of chord 1 (Ia10) changes it into Pb10 (chord 2), similarly chords 7 (Ib10) and 8 (Pa10).

Two further structural features can be found within this progression. Firstly, chords 13-18 are complemented by chords 19-24. In other words chord 13 has no notes in common with chord 19, the same is the case with 14 and 20 and so on. Secondly, the progression of chords 1-12 is reversed to create a palindrome through chords 25-36. However, the palindrome is not strict; chord 30 differs from its mirrored original (chord 7) in that it is an accurate spelling of Ib10. Such subversions from the established system can be frequently found in Gerhard's music. He was not the sort of composer to set up a system and then compose mechanically within its constraints. He believed in working against his own systems:

(a system) has to be lived through and solved (or spoiled) in the process of living it through. But it is the hazards involved that help to make creative work truly an adventure of the spirit. [9]

Chord	Pitch class												Row(s)	Order of introduced notes
	0	1	2	3	4	5	6	7	8	9	10	11		
1				3	4	5	6	7			10		Ia10	Ia10 original order
2				4	5	6	7		9	10			Pb10	
3					5	6	7	8	9	10				
4			2			5	6	7	8	9	10		Pa10	
5							6		8	9	10	11		
6			1	2				6		8	9	10	Ib10	
7	0	1	2						8	9	10	11		
8	0	1	2	3					8	9	10	11	Pa9	
9	0	1	2	3	4							11		
10	0	1		3	4			7					Ib9	
11	0	1		3	4	5		7						
12	0			3	4	5		7			10		Pa9	
13				3	4	5	6		8	9		11		
14				3	4		6		8	9		11	Ib9	
15							6	7	8	9		11		
16	0			3				7	8	9		11	Pa9	
17	0							7	8	9	10	11		
18	0	1						7	8		10	11	Ia9	
19	0	1	2					7			10	11		
20	0	1	2			5		7				10	Ia9	
21	0	1	2		4	5						10		
22		1	2		4	5	6					10	Ia9	
23		1	2	3	4	5	6					10		
24			2	3	4	5	6			9			Ia9	
25 (12)	0			3	4	5		7						
26 (11)	0	1		3	4	5		7					Ib10	
27 (10)	0	1		3	4			7				11		
28 (9)	0	1	2	3	4							11	Pa10	
29 (8)	0	1	2	3					8			11		
30 (7)	0	1	2						8	9		11	Ib10	
31 (6)		1	2				6		8	9		11		
32 (5)			2				6		8	9	10	11	Pa10	
33 (4)				2			5	6	8	9	10	11		
34 (3)							5	6	7	8	9	10	Ib10	
35 (2)							4	5	6	7	9	10		
36 (1)				3	4	5	6	7			10			

Figure 9. *Symphony no. 3, 'Collages', b.400.*

5. METAMORPHOSES

At the start of this paper you could be forgiven for feeling that the essence of serialism (the ordering of the twelve-notes) was neglected by Gerhard through the abandonment of order and use of permutation. However, this 'essence' was deconstructed by his teacher, long before Gerhard began composing serially:

Gerhard first noticed the approach he was to adopt and develop in *Von Heute auf Morgen* op. 32 (1929) where he found that the law of the consecutive order of the tone-row was at times deliberately disregarded. In this opera Schoenberg treats the two individual hexachords of the series as independent units wherein the elements may be freely ordered.... This composition was not an isolated phenomenon in Schoenberg's output. A further example can be found at the beginning of his Piano Concerto op.42, where the series is deployed in strict serial order in the top of the solo part while the left hand draws from the rest of the hexachord in free permutation. [10]

Gerhard's 'approach' was by no means in isolation among the post-Schoenbergian serialists. Stravinsky used permutations of pitches within hexachords (and tetrachords), albeit within a precise rotational system (which has been shown to be indebted to Ernst Krenek) [11]. Stravinsky also had a systematic method of organizing harmonies, which he termed verticals, as they were derived from the vertical alignment of pitches within his serial matrices and Gerhard was certainly aware of Stravinsky's adoption of serialism. [12]

Gerhard realized from the outset that an overt reliance on a fixed order of pitches was unnecessary. He understood that serial technique was not so much dependent on pitch as its fundamental unit but interval, or rather the intervallic content inherent in the collection of pitches which make up the series or its divisions:

whichever way the consecutive order of the series is finally arrived at makes no difference at all to the next step, which is the really important one: the *nature* of the series has to be apprehended. It must be realized that the internal structure peculiar to a series – its grain, as it were – has far-reaching an influence over my subject matter and mode of treatment as the nature of the sculptor's or the painter's or the engraver's material can have upon their respective styles and techniques. [13]

The 'influence' these 'internal structures' made on Gerhard's music can be seen on both the macro and microcosms: from the lengthy sections used to build the *Symphony no. 2* to the organization of textural and harmonic progressions discussed in this paper. What is apparent in Gerhard's work is that the method is not the overriding factor; he considered serial technique to be:

.....a kind of cradle or scaffolding which allows the composer to work at certain aspects or levels of the sound-fabric, at which he could not get without this scaffolding. But what matters, needless to say, is the work. Once this is finished we want the scaffolding removed. [14]

Ultimately for Gerhard what mattered was the end product, not the process used to arrive at it:

I stand by the sound of my music. It is the sound that must make sense... [15]

6. REFERENCES

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