

## Vesuvius

After a study of the serial techniques employed by Igor Stravinsky in *The Flood*, I aimed to compose a solo flute work based on a tone row and transformations of hexachords contained within it. The starting point of the piece was designing a tone row, and the choices made at this stage characterise the music which is drawn from it. In Stravinsky's row, 2<sup>nd</sup> and 7<sup>th</sup> intervals are most prevalent, and the fifth that separates its first and last notes mean that there is scope for tonal allusions.<sup>6</sup> Pitch material is provided first of all by four basic transformations of the row: prime (P), retrograde (R), inversion (I) and retrograde inversion (RI). Stravinsky then derives harmonic material from the two hexachords contained within each row, by creating rotational arrays that provide a further six chords. These arrays are created in one of two ways: first by a method of starting the chord on each of six notes, and second by starting it with each of its intervals (Example 1).

### Example 1: Two methods of constructing rotational arrays

Method one: The hexachord is shifted by one note each time

C#	B	C	F#	E <sup>b</sup>	F
B	C	F#	E <sup>b</sup>	F	C#
C	F#	E <sup>b</sup>	F	C#	B

etc.

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<sup>6</sup> Ja Young Choi, 'Stravinsky's Tonal Allusion and the Rotational Arrays in his Serialism: A Study of *The Flood*', *Pacific Science Review*, 13, no. 2 (2011): p. 98.

Method two: The intervals between each note are shifted one position each time.

	-IC2	IC1	IC6	-IC3	IC2	(-IC4)
C#	B	C	F#	Eb	F	
C#	D	G#	F	G	Eb	
C#	G	E	F#	D	C	

etc.

The basis of *The Flood* is the biblical tale of Noah, and Stravinsky manipulates his pitch material extensively in the service of this narrative structure. Most apparent is the designation of rows to characters and scenes,<sup>7</sup> analogous to the use of leitmotif in tonal music. Rows are 'pivoted' between by moving to a transformation which begins on the note with which the previous ended, and since the fifth relation between first and last notes is maintained through each transformation, the effect is that of a climb through the circle of fifths. This ascent implies a vertical position for each row – the row beginning on the highest note in the circle of fifths is assigned to the character of God, for example - and serves as the means of representing aurally the Jacob's Ladder of the source text.<sup>8</sup>

Stravinsky demonstrates that the structural possibilities of the row and four of its basic transformations are many. I was interested in the idea of the implicit vertical relationship of these transformations in *The Flood*, and aimed to develop a way of making this even more aurally explicit. I chose a loosely narrative structure of a climb to the top of a mountain, and experimented with various tone rows in order to find a way of representing this. I settled on the following:

<sup>7</sup> Andrew Kuster, *Stravinsky's Topology* (Colorado: Andrew Thomas Kuster, 2005), p. 72.

<sup>8</sup> *Ibid.*, p. 80.

**C# Eb G# A B G D F# F Bb C E**

The two hexachords of the row begin on notes which are a semitone apart, and this is maintained throughout all transformations. My ascent would be from a note low in my chosen instrument of the flute's range, and climb to a note of my choosing. The piece is largely written in two voices, with the lower reinforcing the root of the hexachord, and since I was somewhat restricted harmonically in writing for a monophonic instrument, I have assigned each chord a melodic and rhythmic character.

The music begins with the prime transformation of the row, with a melody consisting of the notes of the first hexachord in order (Example 2).

**Example 2:** bb. 1-9 present the first six notes of row P<sub>1</sub> (C#, Eb, G#, A, B)

The musical score for Example 2 is divided into two staves. The top staff is for Flute, written in 3/4 time. It contains four phrases of music, each starting with a dynamic marking and a performance instruction. The first phrase is marked *mp > p* and includes the instruction "non vib. poco". The second phrase is also marked *mp > p* and includes "non vib. poco". The third phrase is marked *mf > mp* and includes "non vib. poco". The fourth phrase is marked *mp > p* and includes "non vib. poco". The bottom staff is for Fl. (Flute), written in 2/4 time. It contains two phrases. The first phrase starts with a dynamic marking of *mf* and a hairpin crescendo leading to *p*. The second phrase is marked "wind sound" and "Andante", starting with a dynamic marking of *f* and a hairpin decrescendo leading to *mf*. The second phrase consists of four groups of eighth notes, each marked with a "3" above it, indicating a triplet.

After an exploration of this chord, a climb to D brings about the second half of the prime row, but after then reaching E flat, it is discovered that a 'wrong' transformation has been selected and there is a fall down to C, which is a semitone lower than the starting point. I have

defined 'wrong' as a chord which is not followed by one a semitone higher. In this case I used a portion of the rotational array of my D chord, and the descent is initiated by the F# being sounded which had been heard as part of the D section (Example 3).

**Example 3:** bb. 42-57, E flat section based on rotational array of D hexachord precedes descent to C.

P1

D	F#	F	Bb	C	E
D	C#	F#	G#	C	Bb
D	G	A	C#	B	Eb
D	E	G#	F#	Bb	A
D	F#	E	G#	G	C
D	C	E	Eb	G#	Bb

42  
Fl. *mf* *f* *mf* *f* *mf* *f* *mf* *f* *mf* *f*

47  
Fl. *mf* *p* *molto rit.* *gliss.* *gliss.* *molto*

52  
Fl. *allarg.* *mf*

A transposed version of the opening melody is heard based on row P<sub>0</sub>, but this time instead of the notes appearing in the order in which they appear in the hexachord, a diversion is taken into a rotational array:

P<sub>0</sub>

C	D	G	G#	Bb	F#
C	F	F#	G#	E	B
C	C#	Eb	B	F	G
C	D	Bb	E	F#	B
C	G#	D	E	A	Bb
C	F#	G#	C#	D	E

A process begins in order to find a way back to the opening C# chord, which happens by shuffling the harmony provided by the above matrix until D and G of the melody are coupled with C# and Eb (bb. 68-74). Condensed versions of the C# D sections follow, since this part of the ascent has already been 'figured out', and when E flat is reached again the row I<sub>4</sub> is chosen instead of the erroneous one selected before.

I decided that the destination of the destination of the piece would be the note G, due to the fact that this is point in the flute's range at which a change in timbre occurs.<sup>9</sup> The summit is reached by way of the first hexachord of row P<sub>6</sub>, which begins on F#. Here the opening melody is again sounded, albeit transposed, but with a new note added. This new note is shuffled, this time by using the vertical portion of a rotational array generated with Stravinsky's first method, until the melody ends on F# which then serves as a cadence on to G (Example 4).

<sup>9</sup> Samuel Adler, *The Study of Orchestration* (London: W. W. Norton & Co. Ltd., 2002), p. 181.

**Example 4:** bb. 143-164. Last note of melody is shuffled until it settles on F#.

143 *accel.*

152

158 *rit.*  
*allarg.* *flz.*

F#	G#	C#	D	E	C
G#	C#	D	E	C	F#
C#	D	E	C	F#	G#
D	E	C	F#	G#	C#
E	C	F#	G#	C#	D
C	F#	G#	C#	D	E

For the high-energy feel of an ascent, I needed a strong rhythmic drive, and achieved this with a technique idiomatic of the flute, triple tonguing. A lot of thought went into how to ensure that the score was not unplayable due to the need for breaths whilst still keeping up

this rhythmic drive, and I consulted the work of Ernesto Köhler guidance. His *25 Romantic Etudes* for flute were my main source for technical advice on the instrument, with number 14, an exercise built purely on double tonguing, helping me to understand the realistic expected duration of a passage without breath.

Bibliography

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