

Serial analysis

- 'Serial techniques relate directly to compositional procedures. That is to say, more or less any piece can be analysed by Schenkerian, formal or comparative methods, if with varying degrees of success; it is no way a precondition that the composer himself should have been consciously aware of Schenkerian or formal principles [...] But serial structures do not occur except through a conscious decision on the composer's part to construct them; and where they do not occur, serial analysis is simply a non-starter' (Cook 1987, p. 295).
- Serial-based music by design necessitates technique-based analysis. My analysis will concern itself primarily with the compositional method, before considering the implications a complete understanding of this process may have for a performer.

(Brief) background

- Saṃsāra ('continuous movement') is a word from the Indian Sanskrit language applied to concept of 'cyclic existence' in both the Hindu and Buddhist religions.
- This was a central part of Siddhārtha Gautama, the historical Buddha's, teachings.
- To escape the supposed infinite cycle of death and rebirth, craving and unfulfillment, expectation and disappointment, it is necessary to come to an accurate understanding of the (supposed) reality of nature and existence (Williams and Tribe 2000, p. 63).

(Brief) background

- My ambition was to create a piece of music which somehow characterised this concept, with a 'circular' structure and no definitive sense of beginning and end.

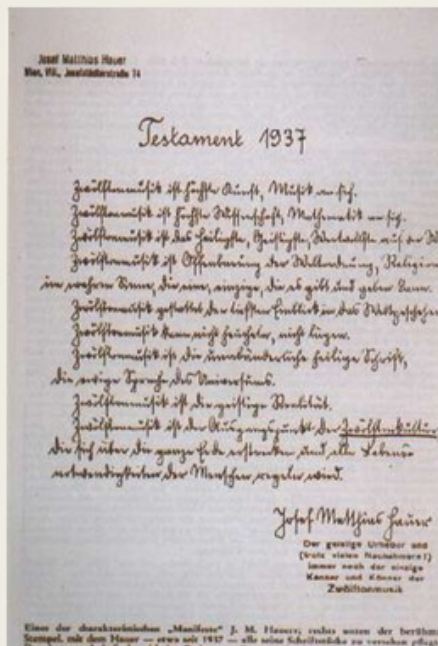


Josef Matthias Hauer (1883 – 1959)

- Developed a theory of twelve-tone composition independently of Arnold Schoenberg.
- The two admired each other early in their careers, and in the early 1920s were even considering authoring a book together (Schoenberg and Stein 1964, p. 106).
- The two eventually became aware of their vastly differing thoughts on the subject, however, and following Schoenberg's success and revolutionary works the relationship soured. Hauer would eventually launch accusations of plagiarism and develop an intense pathological hatred for Schoenberg and everything Schoenberg-related, lasting the last thirty-plus years of the former's life (Gustafson 1979 p. 21).



- Hauer's ideas were of a slightly supernatural nature.
- His concern for twelve-tone composition was based off of a belief that atonal music allowed for contact with some kind of spiritual dimension only accessible when human expression was eliminated, compared with Schoenberg's more logical aim of using a twelve-tone system to create 'the coherence necessary to accommodate personal artistic expression' (Covach 1992, p. 150).



Twelve-note music is the revelation of world order, religion in its truest sense, the only one there is and the only one there can be.

Twelve-note music offers the deepest insight into cosmic order.

Twelve-note music cannot deceive, cannot lie.

Twelve-note music is the unchangeable sacred scripture, the eternal language of the universe.

Twelve-note music is the spiritual reality

The Method

The method

- Structure that is simultaneously impartial, devoid of expression and musical?
 - 'Tonality affects just about every aspect of music, including phrasing, form, the interaction of melody and harmony, texture, orchestration, dynamics, articulation, the structuring of time [...] – even the way we name pitches and intervals. If a piece is not tonal, then many of these musical aspects take on new characteristics' (Lester 1989, p. 2).
- Tone row governs composition.
- Row generates a *kontinuum* – a chordal sequence which 'wraps around itself', ending where it began and therefore making it possible to repeat forever.

Construction

- My row: 0, 1, 7, 9, 8, 6, 3, t, 2, 5, e, 4
(C, C#, G, A, G#, F#, D#, Bb, D, F, B, E)
- Hauer uses the row to derive harmonic, rhythmic and melodic detail.

Presto

Violin I
Violin II
Viola
Violoncello

pp

This musical score shows the first three measures of a piece for Violin I, Violin II, Viola, and Violoncello. The tempo is marked 'Presto'. The key signature has one sharp (F#). The time signature is 6/8. The dynamics are marked 'pp' (pianissimo). The notation includes various rhythmic values and accidentals, reflecting the Hauer row.

This musical score shows measures 4 through 6. The time signature changes to 12/8. The notation continues with complex rhythmic patterns and accidentals derived from the Hauer row.

This musical score shows measures 7 through 9. The time signature changes to 6/8. The notation continues with complex rhythmic patterns and accidentals derived from the Hauer row.

Kontinuum

- Process begins by imagining a four-voice chord which the notes of the row will be entered into.
- The twelve notes of the chromatic scale are assigned a registral spot in the chord, with the pitch classes (0,1,2) in the bottom voice, (3,4,5) in the second, (6,7,8) above this and (9,t,e,) at the top:

(9,t,e)
(6,7,8)
(3,4,5)
(0,1,2)

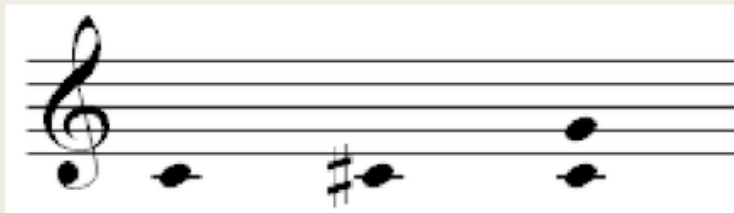
- First note of the row is C, so this is entered as the first note, in the lowest voice.



- Second note is C#, so this **displaces** the C:



- Third note is G, which is entered into the third voice:



- Fourth note is A, which is entered into the top voice:



Row: (C, C#, G, A, G#, F#, D#, Bb, D, F, B, E)

(A,Bb,B)
(F#,G,G#)
(D#,E,F)
(C,C#,D)

- Following this process through to completion results in the following:



Row: (C, C#, G, A, G#, F#, D#, Bb, D, F, B, E)

First note in second voice is D#

Final note of row is E

- One could continue the process by moving back to the beginning of the row. Adding the first note (C in this case) to the final chord gives the following:



- Beginning with this chord and repeating the initial process gives the full *kontinuum*:



Importantly, the full process brings the sequence back to the first chord – a harmonic 'loop'

Rhythm?

- Using the *kontinuum* as a compositional tool ensures a harmonically circular structure, but it also contains information which can be used to derive further aspects of the music.
- For rhythmic configuration, Hauer makes use of the detail provided by the location of each new tone within the chord.

The image displays two systems of musical notation, each consisting of a treble and bass staff. The top system begins with a treble clef, a 3/4 time signature, and a mezzo-forte (*mf*) dynamic marking. The first measure contains a chord with a repeat sign. The subsequent measures show a sequence of chords, with rhythmic patterns of eighth and sixteenth notes. A triplet of eighth notes is marked with a '3' at the end of the first system. The bottom system continues the sequence of chords and rhythmic patterns, also featuring a triplet of eighth notes marked with a '3' at the end.

- In this example from a piano piece dated 19th February 1953, the left-hand part reveals a method: where two new tones appear in a single voice in succession, a dotted quaver and semiquaver figure is used. Where they appear in adjacent voices, two quavers are used, where there is a voice between a triplet appears, and when they are in the outermost voices a semiquaver arpeggio occurs (Covach 1992, p. 154).

Two new tones occur in outermost voices. The result is a downward semiquaver arpeggio in the left hand (downward because the second tone is below the first in this instance).

The chords of the *kontinuum* are played by the right hand.

The image shows two systems of piano music. The top system has two staves. The right staff (treble clef) contains a series of chords, with an arrow pointing to them from the text 'The chords of the *kontinuum* are played by the right hand.' The left staff (bass clef) contains a melodic line with several notes circled in red. An arrow points from the text 'Two new tones occur in outermost voices...' to these circled notes. The bottom system also has two staves, with a triplet of eighth notes in the right staff and a triplet of eighth notes in the left staff.

Samsara

- To serve my circular concept, I decided that each chord would be expressed as an arpeggio.
- The arpeggios are shaped by information derived from the *kontinuum*.
- Each of the instruments is assigned one of the chordal voices, and are therefore treated as equals with no member of the ensemble taking on more responsibility than any other.

Presto

Violin I
Violin II
Viola
Violoncello

pp

This musical score shows the first three measures of the piece. It is marked 'Presto' and features four staves: Violin I, Violin II, Viola, and Violoncello. The key signature has one sharp (F#) and the time signature is 6/8. Each instrument part begins with a piano (*pp*) dynamic marking. The music consists of arpeggiated chords that change every two measures.

This musical score shows measures 4 through 6. The key signature changes to two sharps (F# and C#) and the time signature changes to 12/8. The arpeggiated chords continue to change every two measures, maintaining the 'Presto' tempo.

This musical score shows measures 7 through 9. The key signature changes to one sharp (F#) and the time signature returns to 6/8. The arpeggiated chords continue to change every two measures.

Kontinuum



The new note in the last chord was E.

The 'new' note in the first chord is C, since the last chord in the sequence is made up of D, E, F# and B.

Bars 1-3

Presto

Violin I *pp*

Violin II *pp*

Viola *pp*

Violoncello *pp*

I sound the first chord to establish the 'sound' of the sequence.

At the beginning of the *kontinuum*, the last two new notes to occur were in adjacent voices, with the second coming below the first voice-wise.

The result is an arpeggio in which two notes are heard in each voice on the way down from the highest note.

(The last new note was C)

Kontinuum




A single staff of music in treble clef showing a sequence of chords. The first chord has a circled C note. The final chord has a circled C# note.

The next 'new' note is C#, which occurs in the same voice as the previous new note (C).

Bars 1-3

Presto



Violin I *pp*

Violin II *pp*

Viola *pp*

Violoncello *pp*

The score shows four staves for Violin I, Violin II, Viola, and Violoncello. A dashed green circle highlights the first quaver of the third bar, where all instruments play a single note.

This time the full chord is sounded on the first quaver of the bar, followed by an arpeggio in which each instrument plays only one note.

Kontinuum



New note is B,
which is two voices
above previous
new note.

Bars 4-6

Note that highest voice is moved up an octave to
accommodate increase in notes

Result is arpeggio
with three notes
heard in each voice
on the way up to
the top note.

Kontinuum



A single staff of music in treble clef showing a sequence of chords. The chords progress from a G major triad to a G major triad with a sharp second degree, then to a G major triad with a sharp second degree and a sharp third degree, and finally to a G major triad with a sharp second degree and a sharp third degree and a sharp fourth degree. The final chord is circled in red, and the chord immediately preceding it is circled in blue.

Chord nine is the first instance of new tones appearing outermost voices.

Bars 10 & 11



Four staves of music for bars 10 and 11. The top staff is in treble clef, and the bottom staff is in bass clef. The music is in 12/8 time. A dashed green circle highlights a passage in bars 10 and 11. In bar 10, the top voice has a quarter note G4, a quarter note A4, a quarter note B4, and a quarter note C5. In bar 11, the top voice has a quarter note D5, a quarter note E5, a quarter note F5, and a quarter note G5. The bottom voice has a quarter note G2, a quarter note F2, a quarter note E2, and a quarter note D2. Arrows point from the text below to the top and bottom voices in bar 10.

Four notes are played by each voice on the way down.

Top voice is moved up an octave and lowest voice down an octave.

- My rhythmic rules are as follows:
 - Where two sequential changes occur in the same voice, a *tutti* chord is struck on the first quaver of the bar followed by an arpeggio in which each instrument plays one quaver.
 - Where changes occur in adjacent voices, an arpeggio with two notes played by each instrument, either on the way up or down depending on where the newest note was in relation to the one that preceded, is heard.
 - Where there is a voice between new notes, three notes are heard either on the way up or down, again depending on the positioning of the newest note.
 - And when changes occur in outermost voices, four notes are heard.

- With three-note arpeggios, highest voice is moved up an octave, and is combined with the bass voice dropped an octave in the case of four-note variants.

Presto

Violin I *pp*

Violin II *pp*

Viola *pp*

Violoncello *pp*



2



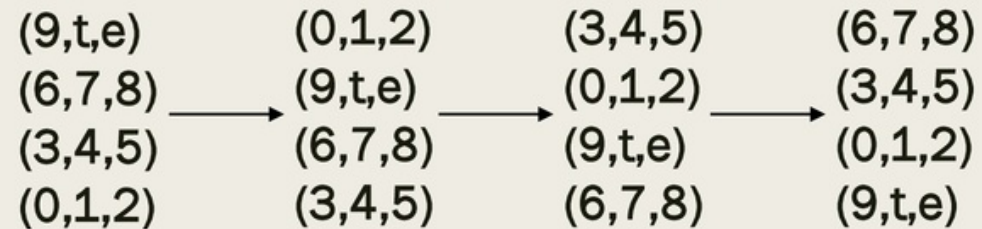
Continuing the construction

- One cycle of the *kontinuum* lasts 13 bars, so this initial process alone is incapable of producing material with the potential for variation necessary to construct an entire piece.
- Transformations of the row and *kontinuum* are necessary to generate any further material.

The image displays a musical score for four instruments: Violin I, Violin II, Viola, and Violoncello. The tempo is marked 'Presto'. The score is presented in two columns of staves. The first column contains measures 1 through 13, and the second column contains measures 14 through 26. Each instrument part is written on a five-line staff with a treble clef for Violin I and II, and a bass clef for Viola and Violoncello. The music consists of rhythmic patterns and melodic lines, with some measures featuring rests. The notation includes various note values, rests, and dynamic markings such as 'pp'.

Inversion

- The initial cycle was based on a four-voice chord divided thus:



- A rearrangement of this chord would produce a different sequence. Hauer's method is what he termed *Stockwerktechnik*, loosely translated as 'root-inversion technique' (Covach 1992, p. 155), whereby the voice situated at the bottom of the chord is moved to the top. This process could be repeated until the voice (9,t,e) is at the bottom, after which further inversion would reproduce the original form.

Each inversion produces a new *kontinuum*

(9,t,e)
(6,7,8)
(3,4,5)
(0,1,2)



(0,1,2)
(9,t,e)
(6,7,8)
(3,4,5)



(3,4,5)
(0,1,2)
(9,t,e)
(6,7,8)



(6,7,8)
(3,4,5)
(0,1,2)
(9,t,e)



- These transformations result in different rhythmic configurations, since the notes of the row will emerge in a different permutation, but also give the effect of the music gradually climbing, since the range of the highest voice is shifted upwards with each inversion.

Presto

Violin I
Violin II
Viola
Violoncello

pp

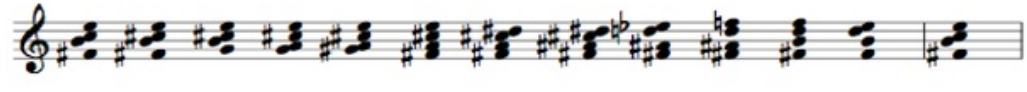
In opening bars, bass voice begins on C3. Since this is based on the chord partitioning with (0,1,2) at the bottom, this is lowest-reaching section.

57
ff

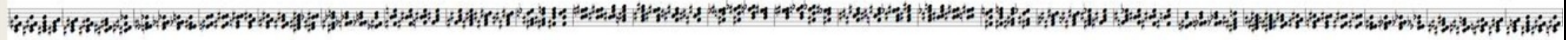
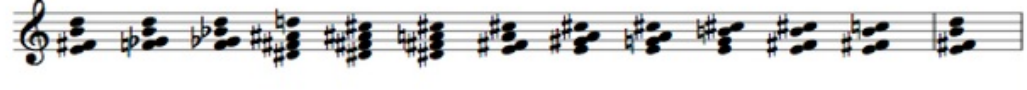
When the final inversion is reached at the midpoint of the piece, the music is at its highest register-wise.

- The second half of the piece employs a retrograde-type technique whilst reversing the inversions. The retrograde produces new melodic material whilst descending back to the original pitch range.

- The overall shape of the music is arch-like.



Retrograde



Summary

- Returning to the Saṃsāra concept, my attempt to produce a piece which is circular on several scales resulted in the following:
 - Smallest scale circles occur at a bar-to-bar level, in the form of arpeggios.
 - Next is sectional – each *kontinuum* is harmonically ‘circular’.
 - On the largest scale, the use of inversion means that the piece as a whole takes the form of a registral loop, climbing to reach its highest point in the middle and returning to the original pitch range by the final section.
 - This form is complemented dynamically, beginning *pianissimo*, reaching *fortissimo* at the mid-section and receding back to *pianissimo* for the final bar.

Implications

Implications



- An understanding of the concept behind the piece may provide an idea of ideal performance practice.

- The score makes a number of presuppositions, which an analysis helps in clarifying:
 - My intention of having the ensemble operate as a single unit is nowhere stated.
 - The need for homogeneity amongst players is something which would become clear to a performer once the piece had begun, but having such information in advance is typically prerequisite to a successful overall performance.

- A performer with an understanding of the piece's architecture will be in a position to allow this same understanding to take shape in the mind of a listener.

The act of performance, of bringing to a living realization the lifeless symbols on the page, is after all the outlet toward which all important musical activity aspires [...] Genuinely illuminating interpretation must arise from the full and deep comprehension of form and structure (Berry 1986, p. 416).

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