Theory of Music – Jonathan Dimond
Béla Bartók (1881-1945)
(version October 2009)

Introduction

Bela Bartok (1881-1945) was a Hungarian composer and pianist who was also a pioneer in the study of the traditional musics of Romania, Bulgaria and Hungary. His contributions to the field of ethnomusicology were considered important for generations of scholars since his time.

The focus of this unit will be upon the sense of proportion in Bartok's music. Proportion, by definition, concerns the relationship of parts to the whole. As we discussed in the previous unit on Golden Section, such proportionality can be deemed aesthetically pleasing or attractive, and give rise to the qualities of strength, longevity, and harmony with the object's surroundings. Proportionality in Bartok's music can be found in his use of rhythm, harmony, melody, phrasing and overall structure.

Fifth String Quartet (1934)

As a composer, Bartok's contribution to the genre of the string quartet is considered as important as Beethoven's, and I have chosen the 5th String Quartet as the focus of our studies. This work was commissioned by the famous patron Mrs Sprague-Coolidge and composed in four weeks. Bartok wrote six String Quartets in all, so this is considered a late work

The theoretical concepts below are largely drawn from Lendvai's book (see Bibliography), and page numbers have been referenced for further reading.

Structure

The five movements of the Quartet are arranged in a symmetrical manner, organized around a central third movement. The symmetry is not as much about key centres, but rather tempo, mood, form and motivic ideas.

I	II	III	IV	V
Allegro	Adagio	Scherzo	Andante	Allegro
Bb	D	C#	G	Bb
sonata	ternary	ternary	ternary	rondo

First movement

Drilling down into the movements themselves, we begin to find the same kind of self-similarity of the parts to the whole as we discussed in the Golden Section unit.

The first movement, for example presents the themes of the exposition in reverse order in the recapitulation.

<mark>See score</mark> rehearsal letters G, H and I, and compare to the opening of the movement, and rehearsal letters B and C.

Furthermore, there is a symmetry of key centres during the movement.

Bar 1	24	44	59	132	146	159	177
Exposition	Trans.	3rd Sub.	Dev.	Recap.	Trans.	1st Sub.	Coda
1st 2nd Sub.				3rd 2nd Sub			
Bb	C	D	E	F#	Ab	Bb	

The key movement for the beginning-climax-end is Bb-E-Bb.

Drilling down further, we find evidence of the symmetrical arch form shape in phrases themselves. Take for example the final phrase of the movement.

<mark>Task:</mark> Write the final phrase bar 217-218 on one treble stave; analyze the harmonic intervals between the two parts and the ordered pitch intervals within each part.

The Axis System

Definition: The assignment of tonic, subdominant, or dominant qualities to chords of any kind built from the 12 chromatic pitches. These pitches are organized into groups of four per each of the three axes. They are derived from the circle of 5ths/4ths and the functional relationship of keys in terms of major and minor. {see Lendvai p.1-3}

Note the structural features of these axes:

1) They contain 4 notes each, a minor third apart.
2) The axes consist of a primary branch with a pole, a counterpole (which is a tritone away and functions as a principal substitute for the primary pole), and a secondary branch perpendicular to the principal branch.

The acoustic explanation of the origin of the axis system relates to the overtone series, and the manner in which successive steps up the series flit between notes of tonic or dominant function. Cadential relationships are based upon this function. {see Lendvai p.10}

Harmonic series	C	C	G	C	E	G	Bb	C
Partials	1	2	3	4	5	6	7	8
Function	T	T	D	T	D	D	D	T

The example given by Lendvai demonstrates the clarity in which Bartok uses chords built upon the tonic function axis to provide "home key" sensation in his "Music for Strings Percussion and Celeste" (1936) {see Lendvai p.4-5}. <mark>Listen to CD and read score.</mark>

Bartok prefers to orientate the primary poles of the three axes such that an equidistance is featured – a tonal progression of major thirds. This is in keeping with the 12-note aesthetic, which sought to find ways of organizing pitches to equalize importance and create indifferent tonal relationships. {see Lendvai p.15}

$$S = Ab$$
$$T = C$$
$$D = E$$

<mark>Tasks:</mark> Rewrite the three axes in the key of the 1st movement of the Fifth String Quartet.

Trace the key areas from bar 1 to 50 and then from letter K (201) backwards and note the palindromic presentation of axes-related key areas. I have listed the key areas from bar 1 to letter K below, in the order that they appear.

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

The Fibonacci Series in Chords & Intervals

The integer model of pitch gives us the following intervals from the Fibonacci series:

1 = minor 2nd
2 = major 2nd
3 = minor 3rd
5 = perfect 4th
8 = minor 6th
13 = minor 9th
{see Lendvai p.35}

Golden Section proportion, then, finds its way into Bartok's melody and harmony with the prevalence of these intervals. The following scales can be considered as source material for melodic motives:

- Octatonic scale (1:2) (the so-called "axis scale") {see Lendvai p.55} (N.B. the octatonic scale also refers to the 2:1 scale – a mode of the 1:2 scale)
- Pentatonic scale (particularly the minor pentatonic – mode 3 of major) {see Lendvai p.49}

Consider also the span (range) of a particular melody or motive/theme, in terms of the number of semitones from top to bottom, and above and below the tonicized pitch. {see Lendvai p.36-37}

Harmonically, Bartok's so-called "major-minor" chord features these "GS intervals". {see Lendvai p.9} This 4-note chord contains 2 notes each from the T and D axes, and can be heard as a major #9 sound, implying the octatonic scale.

This sound, in its fully-fledged form, combines all the notes from these two axes and therefore all 8 notes from the 1:2 (octatonic) scale. The so-called 'alpha' chord is a "double-diminished" chord. {see Lendvai p.55-56}

The Acoustic Scale/Chord

The first 11 partials of the harmonic/overtone series yields a group of notes which characterize Bartok's "diatonic" system. Rearranged into a scale, it creates the "acoustic scale" – recognized as a Lydian dominant scale (mode 4 of melodic minor). The vertical rearrangement of such a scale creates the dominant 7th #11 chord. {see Lendvai p.67-70}

Another way of creating a similar collection of notes is to take those notes that remain once the GS intervals of 1, 3, 5 and 8 are removed from the chromatic scale. The resulting complementary scale is very close to the "acoustic scale".

The Golden Section in Form

There are several methods one can observe Golden Section proportion in form/structure: {see Lendvai p.17}

- Number of bars X 0.618

(this can be applied to movements and sections of movements)

- Real time X 0.618

(use the CD player track time and/or Bartok's recommended timings)

- Number of beats X 0.618

(useful for changing time signatures, mixed and compound metres, and for sections of movements)

- Number of pulses X 0.618

(useful for complex/odd time signatures, and for sections of movements)

Note that the negative Golden Section should also be considered.
If
1:x = x:(1-x)
Then the smaller remaining part equals
1-0.618 = 0.382
So, in summary:
GS^+ is by a factor of 0.618
GS^- is by a factor of 0.382

Also consider nestled Golden Section proportion (of both positive and negative kinds), whereby GS proportion is contained within one part of a greater GS structure. {see Lendvai p.24}

At and around these GS points, look for important hits/events, themes, changes in harmony, registration, tempo, dynamic, melodic changes, changes in texture/polyphony, orchestration etc.

Rhythm

So-called "Bulgarian rhythm" consists of asymmetric groupings of pulse, such as 2+2+2+3 (or 4+5 = 9/8). The beat thus has a bit of a "lilt" or "lurch" effect, and Bulgarians tend to count them as "one two three foooour!". Such groupings are sometimes revealed explicitly by the metre, such as in Bartok's 'Six Dances in Bulgarian Rhythm' No.1 (which features the aforementioned metre, as does the 3rd movement of the 5th String Quartet), but can also appear camouflaged within more regular metres such as 4/4. When they do, the use of ligatures (beams) and sometimes dotted (false) bar lines assists the musicians in interpreting the stresses correctly.

"Bulgarian rhythm" also relates to the way two or more parts interlock to create a seamless whole. Bartok often orchestrates his parts to feature groupings pulse split between two voices or more. Tension can be created by establishing an interlocking texture and then phasing one part from another. (NB: it is worth considering how instrumental combinations are used for this effect and other orchestration effects.)

"Bulgarian rhythm" is intuitively dance-like, and captures a certain passion and momentum.

Conclusion

In the music of Bartok, we find an approach to harmony which simultaneously acknowledges functional harmonic expectations, in terms of T-D-S relationships, cadences, and so forth, and yet creates freshness, momentum and tension through the 12-tone principals of equivalence of pitches, equidistance of intervals and symmetry. The harmonic mix is then steeped in a sound which is folky and earthy – inspired by the music of the traditional Hungarian, Bulgarian and Romanian cultures. The result is an organic old world/new world combination, fused by an awe-inspiring formal organization.

Bibilography/Discography

- Bartok, Bela: *String Quartets.* New Budapest Quartet. Hyperion, 1996. [CD 785.7194 BAR]
- Bartok, Bela: *Music for string instruments, percussion and celesta*, 1936. (score) [MU 785.58 BAR]
- Lendvai, Erno. *Bela Bartok: An Analysis of His Music.* Kahn & Averill, London, 1971. [780.924 BAR:L]
- Madden, Charles. *Fib and Phi in Music - The Golden Proportion in Musical Form.* Salt Lake City: High Art Press, 2005. [781.2 MAD]
- Bartok, Bela: *The string quartets of Bela Bartok* (score). Boosey & Hawkes, 1945. [MU 785.7194 BAR]
- Gillies, Malcolm. *The Bartók companion.* Faber,1993. [780.92 BAR]