Palindromic Structures in the Music of Bartók and Webern: the Search for Organic Unity

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Contents:

Introduction

At first sight, the musical outputs of Béla Bartók (1881-1945) and Anton Webern (1883-1945) could hardly have been more dissimilar. Surprisingly, they lived almost exactly in the same time period. Bártok was born scarcely two years earlier and died eleven days later than Webern. Even more surprising is that, through their teachers (Hans Koessler and Arnold Schoenberg), both composers stemmed from a tradition where Brahms was the main pivotal figure.[1] One can only image how similar their styles might have been, had the seventeen-year-old Bartók not declined the offer by the Vienna Academy to a scholarship and went to study in Budapest instead of Vienna.[2]

While both composers went their own ways and developed their own individual musical language in a period when traditional tonality was gradually falling out of favor, there are similarities between their styles. For instance, they had a mutual interest in the field of musicology, which had an impact on their own style as well. Bartók was interested in ethnomusicology, and incorporated folk music in his compositions. Webern focussed on early music, writing his thesis on the *Choralis Constantinus* of Heinrich Isaac, where the economical use of musical material was of particular interest for his own music. In particular their mutual interest in natural sciences was conspicuous: both composers were especially drawn to plants and especially their (symmetrical) designs. This may be the root of the most important similarity of Bartók and Webern: their fascination with and extensive use of musical symmetry. This thesis will focus on one aspect of symmetry that is particularly evident in their musical output: the musical palindrome.

Altogether, these striking resemblances raise the question if there are more similarities underneath the surface of their music than it is possible to hear. Much has been written about the symmetrical procedures of both composers, yet a direct comparison of musical symmetry and its philosophical motivations that connects the two composers has not been done yet. Therefore, the aim of this thesis is to uncover a connection between the music of Bartók and Webern by analyzing their application of palindromic structures as well as the underlying search of musical organicism – a

[1] Victoria Fischer, "Piano Music: Recital Repertoire and Chamber Music," in *The Cambridge Companion to Bartók*, ed. Amanda Bayley (Cambridge: Cambridge University Press, 2010), 104.
[2] Ibid.

sense of musical unity – that lived well into the post-tonal era. All the stylistic differences notwithstanding, the palindromic structures both composers were drawn to and the underlying ideology that motivates these compositional techniques seems to be a common feature in the styles of the two composers. Furthermore the ideology places their music in a tradition where unity seems to be a fundamental value. This validates and stabilizes their new music in the history of Western classical music, through the development of traditional ideology with new musical systems. It also paves the way for further developments of unity in succeeding musical styles, most notably in serialism.

In terms of methodology, the first part of this thesis will primarily consist of musical analysis of pieces and passages that are specifically relevant to the subject of musical palindromes. Furthermore, meta-analysis of analyses by other scholars will be done to get an overview of different views and interpretations on the subject. This first part, thus, will primarily focus on the music itself. But since music is always an interaction between composers with his or her specific background, the ideology and motives behind their musical choices needs to be researched. This gives a deeper understanding of the musical language and frames it in a wider context of music history and tradition. This will be the main focus of the second part of this thesis and will be done primarily with literary study on the relevant concepts.

To summarize: in analysis of musical output, one can adapt the basic model of communication:

Producer (composer) → Message (score) → Receiver (listener)

This thesis focuses mainly on the producer and message side of this model. It will not deal with the reception of the music, which is represented at the right side of the model. However, some attention will be paid to the perception of certain musical phenomenon that fit the discussion of the analysis.

In her article, Janet M. Levy encourages musical analysts to be aware of covert values in their writing about music, not least when dealing with concepts of unity and organicism.[3] It is not my aim to give specific judgement about the music when talking about the unity of it. My aim is to demonstrate the methods that are used

[3] Janet M. Levy, "Covert and Casual Values in Recent Writings about Music," *The Journal of Musicology* 5-1 (1987): 27.

to convey unity and that this search of (organic) unity is something that is deeply rooted in the music of Bartók and Webern, and in music history itself.

In the first section of my thesis I will give a brief overview of the palindrome as a musical phenomenon, discuss specific examples and provide classification. Subsequently, I will analyse examples of different categories of palindromes and discuss their implications to the overall musical fabric. The comparison of the two composers will be given a special attention. Lastly, I will contextualize my analyses in the ideas of musical organicism and unity that seem to be the driving forces behind the symmetrical structures. By doing so, I will demonstrate that not only the similarities between the ideas of both composers, but also their connection to earlier musics.

Part 1. The Musical Palindromes of Bartók and Webern

1.1 The musical palindrome: A brief overview

In the realms of musical symmetry, the phenomenon of palindrome holds a considerable place of interest throughout music history. However, its most perfect form, where the entire fabric of a first half is being followed by its exact reversal after a specific mirror point, is quite rare. An early example of this true palindrome can be found in Medieval France, where it was embedded to convey divine symmetry in a ludic manner by Guillaume de Machaut in his *Ma fin est mon commencement* (1356).[4] Later known examples of true palindrome structures are found in William Byrd's eight-voice motet *Diliges Dominum* (1575), C.P.E. Bach's Minuet in C for keyboard, the minuet of Joseph Haydn's Symphony no.47 and in No.3 of Schubert's opera-melodrama *Die Zauberharfe* (1820).[5] Yet it was the twentieth century where composers increasingly trended towards the palindrome, most notably the members of the Second Viennese School. Examples are to be found in Alban Berg's *Lyric Suite*,

[4] This composition reflects Christian symbolism through the use of symmetrical musical design. Its text and notation playfully guide the reader on how to realize the composition. Furthermore it reflects the design of the double retrograde design of the maze at the Reims cathedral where Machaut was active.
[5] Brian Newbould, "A Schubert Palindrome," *19th-Century Music* 15-3 (1992): 207.

the Chamber Concerto and the film music in *Lulu*, and also Arnold Schoenberg drew inspiration from it with the cancrizans in *Pierrot Lunaire*.[6] It was Anton Webern, however, who especially utilized the palindrome in several different ways, granting it a decisive structural role in his musical language as will be elucidated in detail in this thesis.

When one thinks of a palindrome as a reflection of a specific model in a certain space, it becomes clear that it does not limit itself to the horizontal dimension alone. In music, the mirrored counterpart can also exist above or below a given axis, resulting in a vertical palindrome. It is in this realm where we find most of the palindromic structures of Bartók, yet also some of Webern. In critical literature there are many examples of how the phenomenon of symmetry plays a significant role in the music of Bartók. For the sake of conciseness and relevance this thesis will focus solely on the palindromic structures, in their actual musical appearance or as a motivation for choice of musical material.

Since musical parameters are above all organisations of particular elements that can be structured in a balanced manner, symmetrical relationships in music can exist in practically every musical parameter thinkable. The organisation of dynamics, for example, forms a palindromic relationship between the third and fifth variations of the second movement of Webern's Symphony, Op. 21 (1928).[7] Although the symmetrical relationships in the slightly more secondary parameters like dynamics, orchestration or texture are interesting, the focus of this thesis will lie on the more obvious parameters of pitch organisation, rhythm and form. It is within these features where the true sophistication of both composers becomes most evident and where the most connectedness is found. To keep this thesis orderly, a categorisation of the most relevant palindromic structures will be given.

The first category consists of the palindrome in its most well known form, which is in the horizontal dimension, where a particular statement remains identical whether one reads it from the left to the right or from the right to the left. It is Webern who particularly explored the opportunities in this dimension. Since these horizontal palindromes deal with particular statements in time, they can exist in much larger forms than just short musical passages. Bartók and Webern, as will be explained,

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[6] Ibid., 208.
[7] Mark Starr, "Webern's Palindrome," *Perspectives of New Music* 8-2 (1970): 139. A movement that contains a formal palindromic relationship on a larger scale itself, which will be discussed later.

incorporated these larger form palindromes in different ways. Secondly, as already mentioned above, palindromes exist in the vertical dimension, where a certain gesture is being duplicated above or below a particular mirror point. In music this mirror point is usually a specific note or a dyad of two successive semitones, which forms an axis to which the notes above and below are intervallically symmetrically related. Examples of this are numerous in the music of Bartók but also Webern drew to this method. One must note that the composers can, at any time, combine the palindromes of these two dimensions establishing multidimensional symmetry, which will be indicated in the analyses when it arises. Lastly, palindromic structures are found on a small level, where a small number of palindromic related pitches form the building blocks of a greater compositional organisation. This forms the last category - the cellular palindromes - and it particularly concerns Webern's pre-compositional process of forming twelve-tone rows that are symmetrically driven, and the different symmetrical cells Bartók uses for an overall pitch organisation in several pieces.[8]

1.2 Horizontal palindromes

As mentioned earlier, this is the domain where primarily Webern excelled in, and a pivotal work that shows his distinctive approach to these palindromic structures is the first movement of Variations for Piano, op. 27 (1936). Thus, it is worth analysing in detail.

The clearest horizontal palindromic construction is already being stated in the first seven measures of the first movement and is archetypical for the entire movement (see example 1). The opening gesture consists of the right hand playing the first six notes of the prime form while being accompanied by it's retrograde in the left hand until the mirror point, halfway in bar 4, where they switch roles and play their previous stated gesture in perfect retrograde, thus creating a true horizontal palindrome. The continuously pairing of the prime and retrograde form of the twelve-tone row, which connects all three movements of the piece, is the fundamental idea of the entire piece and results in several small palindromes.[9] These palindromes differ in

[8] I am aware of the organicist metaphor here and I am not trying to get ahead of myself, yet this seems to be the most concise way of categorising these small palindromic building blocks.
[9] Richard Taruskin, "Chapter 12 In Search of Utopia." In Music in the Early Twentieth Century, Oxford University Press. (New York, USA, n.d.). Retrieved 12-04-16, from http://www.oxfordwesternmusic.com/view/Volume4/actrade-9780195384840-chapter-012.xml.

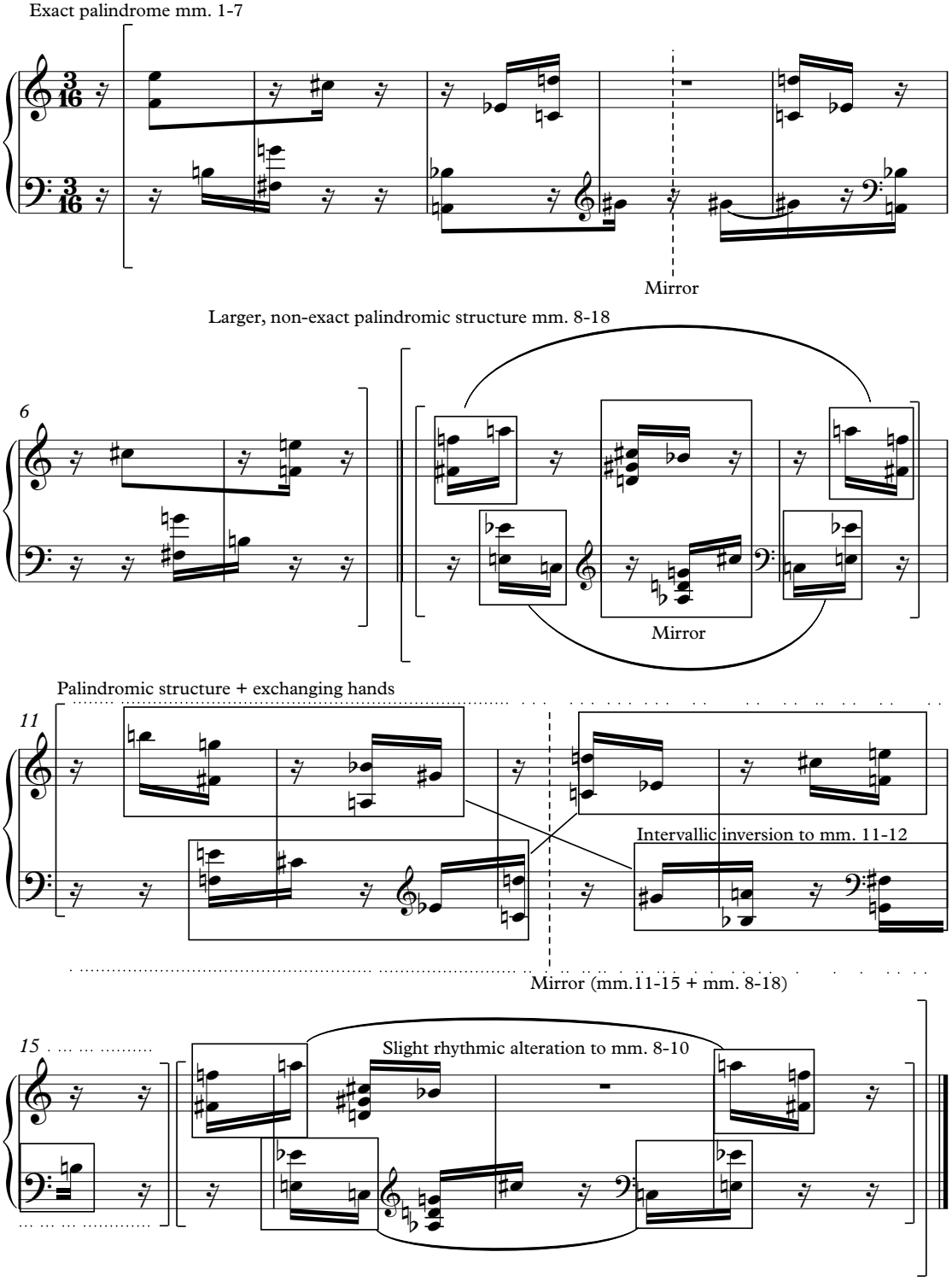
certain aspects from each other, which demonstrates the variety in the use of this unifying structural element.

In the second phrase, mm. 8-10, both hands play a gesture that is being reversed after an interruption by a different figure. Again, the right hand is playing a certain row form while the left hand plays its retrograde, but the intersecting gesture is quite interesting since it seems to interrupt the palindromic expectation. At first sight, the mirror point of this section seems to fall on the second sixteenth of m. 9, but this does not seem to fit the very clear mirroring turnarounds of the overall piece. The intention of this particular section and its symmetrical quality is better to be found in the vertical dimension. The triads both hands play (D, G♯, C♯ and A♭, D, G) share the same intervallic relation (a tritone followed by a perfect fourth) and can be, with registral alteration, centred around an axis on the dyad B/B♭. The entire bar thus, seems so function as a mirroring point.

The third phrase demonstrates another variation of the use of the palindromic microstructure. For the first time each hand plays an entire row form, the left hand P0 and the right hand its retrograde, making a halfway reflecting point unavoidable. Thus here the right hand is reversing the statement of the left hand and vice versa, albeit with registral adjustments and the inverting of some dyads.[10] This phrase is followed by a restatement of the second phrase with certain rhythmical changes. This restatement causes a palindromic construction on a larger scale, with a mirror at the halfway point of the third phrase at m. 13. This larger-scale palindrome is of course mostly concentrated on pitch, since the fourth phrase differs rhythmically from the second. The remaining sections of the piece keep building on this idea of pairing certain row forms with their retrograde, with the permission of slight alterations or an overlap in the ending of one row form with the beginning of another one.

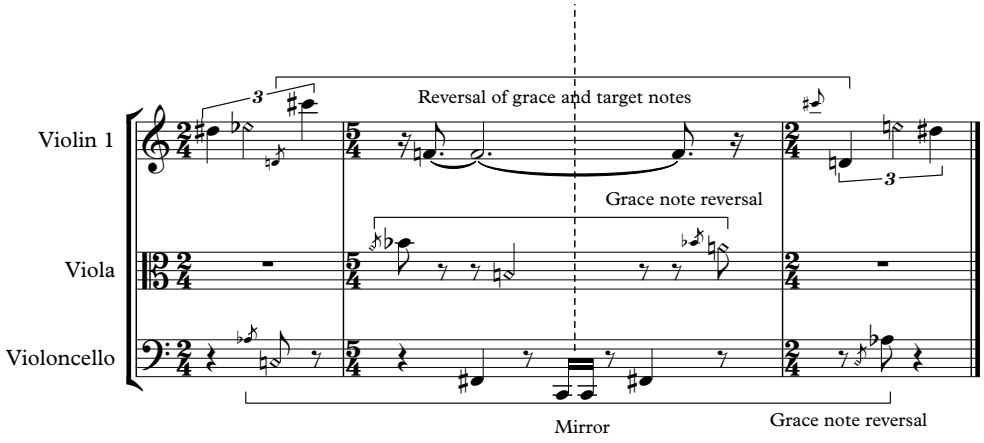
[10] Kathryn Bailey, *The Twelve-Note Music of Anton Webern: Old Forms in a New Lanuage* (Cambridge: Cambridge University Press, 1991), 109.

Example 1) Anton Webern, Piano Variations, Op 27/I, mm. 1-18



The opening statement of the first movement of Webern's String Trio, Op. 20 (1927) is a horizontal palindrome as well and is in fact the only example of this type of symmetry in the movement until its retransition at the end of the C section of the rondo form.[11] Unlike the first movement of Op. 27 there is no row form being accompanied with its retrograde, but rather a row form being followed with its retrograde after the mirror point on the fourth beat of the second measure (example 2). The illusion of a true palindrome is created, yet the significant role of the grace notes distorts this. After the mirror point, the grace notes are being reversed as well (since grace notes always precede the fundamental note), maintaining the order of the pitches but changing the rhythm and overall flow of the passage. Bailey comments on this, justly, that this makes the palindrome more evident visually than aurally.[12] Nevertheless, the palindromic incentive of Webern is clear, and the passage demonstrates yet another distinctive outcome of this.

Example 2) Anton Webern, String Trio, Op. 20/I, mm. 1-3



Since horizontal palindromic structures deal with symmetry over time, it can portray a key role in the overall structure of a piece. To achieve a formal palindromic structure, symmetry on a large scope has to be crafted, which has been done by our two composers with several approaches.

Webern's tactic to achieve a palindromic structure that covers the entire form of the second movement of his Symphony, Op. 21, is eloquently described by Mark

[11] Ibid., 239.
[12] Ibid.

Starr in his article "Webern's Palindrome."[13] By analysing the internal structure of the variations, he finds strong relatedness between the variations that are mirrored around the more self-contained fourth variation. Subsequently, variation 1 and 7, 2 and 6, 3 and 5 and also the theme and coda are connected through various internal organizations, making the overall structure palindromic with the fourth variation as mirror point.

Bartók, with his frequent use of the arch form or "bridge form" as he called it, employs a similar approach in the overall design of several multiple-movement works, where relatedness between paired elements that surround a midpoint causes a palindromic formula. His Fourth Quartet (1928) is the first example of this, as it consists of five movements that are symmetrically structured. Its middle point, a slow movement, is surrounded by a scherzo on each side, while the closing movement functions as the complement of the initial sonata-allegro movement.[14] Moreover, the corresponding movements (I and V plus II and IV) contain an identical thematic basis.[15] The third movement strengthens its middle point status by having unique features in comparison with the other movements, most notably "the slow tempo, the seemingly improvisatory melodic lines, the sustained accompanying chords, the primary role of the whole-tone dyad."[16] Important to note is that Bartók did not label the work as a rondo, ABCBA, but rather in a way that portrays his preference to maintain dynamism and a sense of return; ABCB'A'.[17] With this, Bartók's bridge form "is not static: it does not return to its origins but progresses towards a cathartic outcome."[18] One might, thus, argue about the true palindromic quality that spans the entire work, yet it is clear that Bartók explored ways to fit his fascination with symmetry in a larger timespan, ensuing macro level unity and relatedness.

[13] Mark Starr, "Webern's Palindrome," 127-143.
[14] George Perle, "The String Quartets of Béla Bartók," in *The Right Notes: Twenty-Three Selected Essays by George Perle on Twentieth-Century Music*, ed. George Perle (Stuyvesant, NY: Pendragon Press, 1995), 164.
[15] Ibid.
[16] Ibid., 165-66.
[17] Richard Taruskin, "Socially Validated Maximalism," in *Music in the Early Twentieth Century: The Oxford History of Western Music*, ed. Richard Taruskin(Oxford: Oxford University Press, 2010), 402.
[18] Lásló Somfai in Taruskin, "Socially Validated," 402.

Likewise, this design, where paired movements that share thematic material flank a central movement, formed the inspiration for his succeeding Fifth Quartet (1934), the Second Piano Concerto (1930-31) and the Concerto for Orchestra (1943).[19]

To conclude, Webern uses horizontal palindromes mainly in small passages, mostly to maintain coherence between two successive parts. Bartók uses the horizontal palindrome at a larger scope, maintaining coherence between the movements of an entire work. The ideology behind this all will be discussed in the second part of this thesis.

1.3 Vertical palindromes

1.3.1 Palindromes and folk music

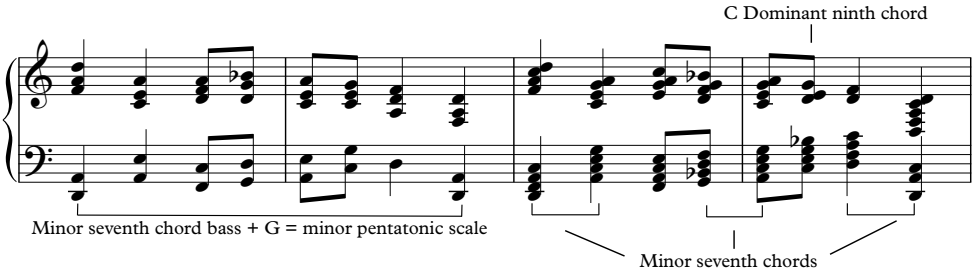
Vertical palindrome structures play an important role in Bartók's music in various shapes and serving multiple goals. Though the structures do not always portray exact palindromes, the exploration of possibilities of pitch organisation around a mirroring point is a frequently used facet in Bartók's musical language. This mainly results in the symmetrical structuring of pitches around a certain axis to where the intervals are being inverted, thus remaining the same above and below the axis. This approach resembles the harmonic arrangement of Salome by Bartók's early hero, Richard Strauss.[20] Before explaining this type of axial symmetry, a light will be shed upon an additional method of vertical, intervallic palindrome configurations that Bartók incorporates in his harmonization folk melodies.

For example, the frequent use of the minor-seventh chord in the harmonization of a particular peasant-song set in the D-Aeolian mode in his Bagatelle no. 4 (1908) can be motivated by an intervallic palindrome technique (example 3). The intervals in this chord remain the same whether one counts them starting from the top or from the bottom (minor third, major third, minor third) and is thus palindromic.[21] This is enriched in m. 4 where Bartók adds a ninth to the dominant seventh chord on C, now making the palindromic interval structure major third, minor third, minor third, major

[19] Perle, "String Quartets," 166; Taruskin, "Socially Validated," 402.
[20] Taruskin, "Socially Validated," 388.
[21] Ibid., 382.

third. Moreover, the bass line that grounds the parallel movement of the minor-seventh

Example 3) Béla Bartók, Bagatelle No. IV, mm. 1-4



chords spells out a minor-seventh chord in itself, with the G functioning as a passing tone.[22] This G is of special significance when incorporating it into the minor-seventh chord, since it forms the axis-note for the D-F on the one side and the A-C on the other, making a clear intervallic palindrome. This also demonstrates the importance of the pentatonic scale (D-F-G-A-C), the foundation of the oldest Hungarians peasant tunes, whose harmonic limitations motivates the choice of the minor-seventh chord as a primary sonority.[23] This offers the possibility that these chords are driven more by this aspect than symmetrical features. Yet a combination of these facets seems to be the key to understand the harmonization of this folk tune as a search outside the traditional major-minor scale, while maintaining a certain tonality, or "a new concept of sonic unification."[24] A symmetrical chord like the minor-seventh chord is, according to George Perle, more stable because of its self-evident structure and can function as a "point of origin or destination of a harmonic progression."[25] Here it functions as a stable tonic in the overall modal environment, without a dominant chord on the fifth scale degree with its leading tone. This exhibits the quality that palindromic symmetry possesses to empower a different way of expressing tonal implications outside the traditional tonality, a quality we will encounter even more later on.

The succeeding Bagatelle, no. 5, also consists of a folk song with the minor seventh chord as a primary consonance, yet here the material for the melody is

[22] Elliott Antokoletz, *The Music of Béla Bartók: A Study of Tonality and Progression in Twentieth-Century Music* (Berkeley: University of California Press, 1984), 29.
[23] Ibid., 27.
[24] Ibid., 30.
[25] George Perle, *Serial Composition and Atonality: An Introduction to the Music of Schoenberg, Berg, and Webern* (London: Faber and Faber, 1962), 27.

symmetrically motivated as well.[26] It is set in the Dorian mode on G, the only diatonic mode whose intervals remain identical when it is inverted. Bartók would later demonstrate the interaction between this intervallic symmetrical mode and the octatonic scale, as both share a pair of tone-semitone-tone tetrachords, where the Dorian mode separates these tetrachords a tone apart and the octatonic a semitone.[27] As mentioned, the primary sonority is the minor-seventh chord, yet occasionally set in the first inversion, which reduces its palindromic character somewhat. But this chord functions as a tonic that reminisces the traditional tertian harmony, but consisting in of a collection of equal pitches.[28]

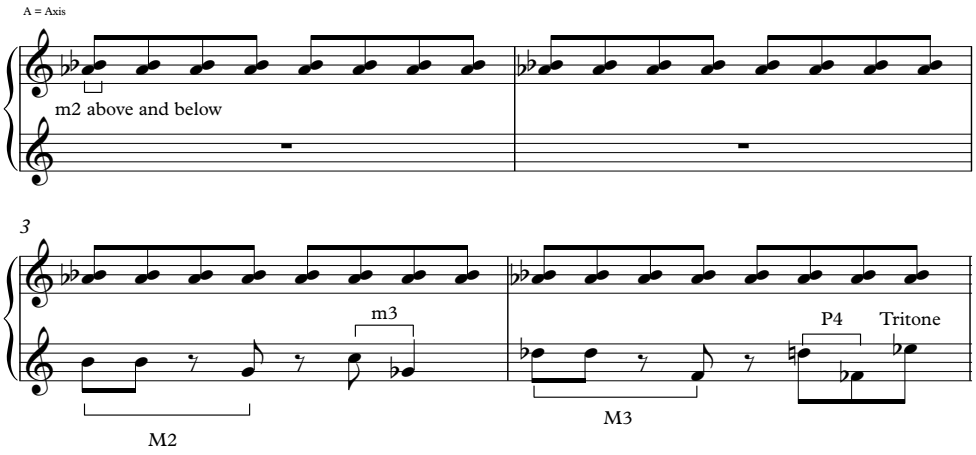
Even though Bartóks choice of symmetrical material for these two pieces offer a great deal of palindromic possibilities, he does not seem to give it a decisive formal function for the overall structure. The material a composer draws upon can be symmetric, but this does not necessarily serve as the principal structure of a piece. In the previous two examples it becomes clear that Bartók incorporates palindromic structures to form a synthesis between his Hungarian traditions and modernistic stylistic progress. Bartók himself wrote in an article about the influence of peasant music on modern music about this process, stating that the accompaniment should serve merely "as an ornamental setting for the precious stone: the peasant melody."[29] Here the symmetrical ingredients of the harmonisation are secondary to the foregrounded peasant melody, thus symmetry is merely a means to achieve the goal of a synthesis between peasant and modern music. This synthesis forms an essential feature in the musical language of Bartók and separates him from his contemporaries, since was the only composer that truly attempted to blend the modernism with a sense of traditional social validation.[30] Something other composers found harmful to their artistic progress.[31]

[26] Ibid.
[27] Ibid.
[28] Antokoletz, *The Music of Béla*, 32.
[29] Béla Bartók and Benjamin Suchoff, *Béla Bartók Essays* (London: Faber and Faber, 1976), 341.
[30] Taruskin, "Socially Validated," 379-80.
[31] Ibid.

1.3.2 Vertical palindromes as a new form of tonality?

Vertical palindromic relations around the axis of A form a substantial part of the structure of Bartók's Bagatelle No, II.[32] The opening dyad, A♭/B♭, in the right hand directly declares this, and the note pairs in the left hand succeed the

Example 4) Béla Bartók, Bagatelle II, mm. 1-4



method the next two measures (example 4). Although the symmetrical relations are obvious, the palindromic quality is not as exact as Webern's canonic build second movement of his Piano Variations, since only the intervals are being mirrored but the duration and the repetition of notes are treated freely. Consequently, what happens above the axis is not identical to what happens below it, yet these intervallic palindrome-based relations will be proven below to be a structural method in the pitch organization of numeral works of Bartók. *Music for Strings, Percussion, and Celesta* (1936) is a pivotal piece in this vertical mirroring technique and forms an interesting comparison with the second movement of Webern's Piano Variations Op. 27 (example 5).

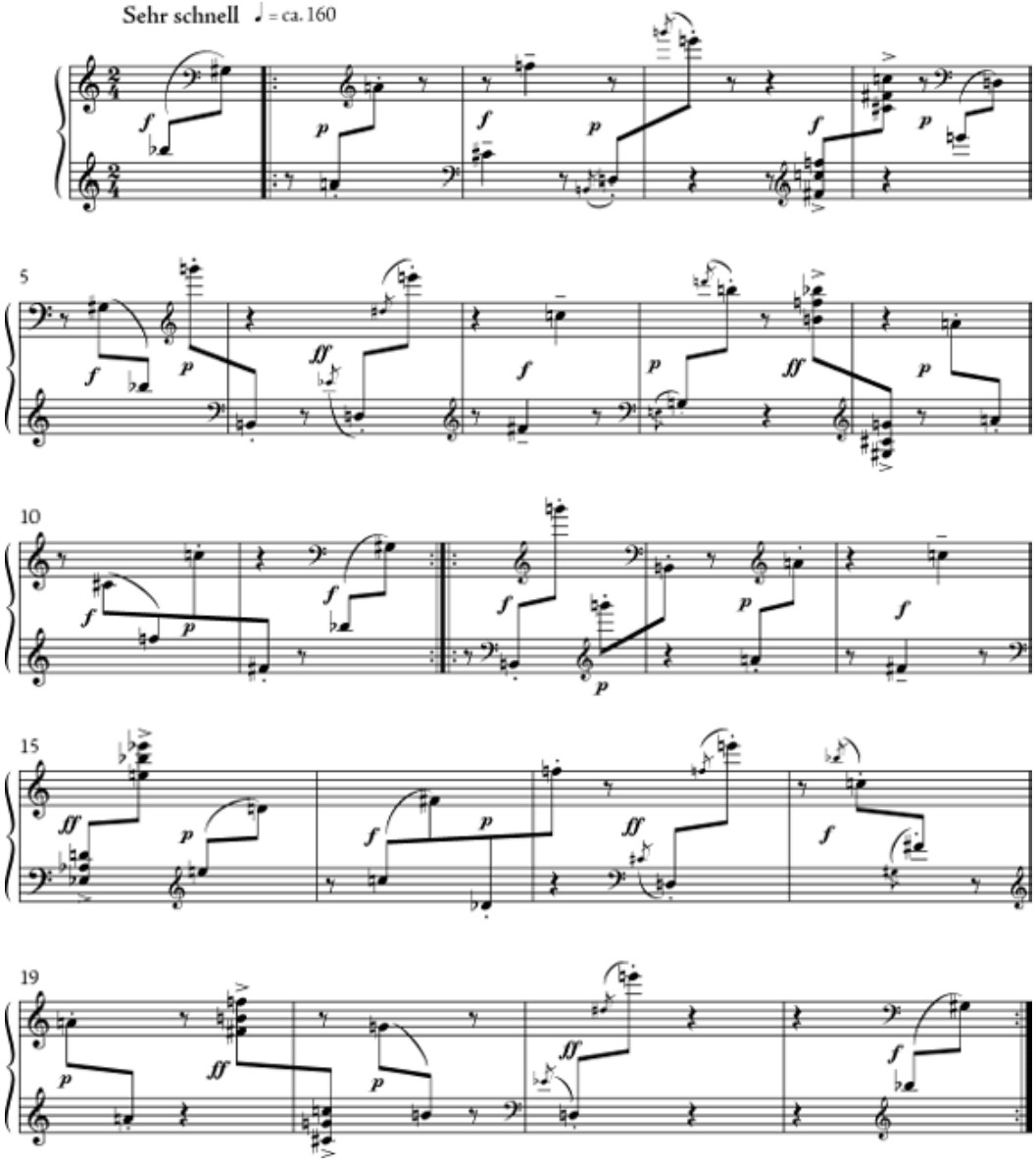
Where the first movement of Op. 27 excels in the application of the horizontal palindromic technique, the second movement does so in the vertical dimension. The canonic piece consists of row forms that are combined with their inversions around a vertical mirror that locates itself on a'. Thus every interval that lies beneath this a' is succeeded with the same interval above a' and vice versa, forming a contrapuntal vertical palindrome set in a dodecaphonic environment. Important to mention is that

[32] Antokoletz, *The Music of Béla*, 141.

besides pitch and rhythm, the grace notes, articulations and dynamics are being mirrored as well.[33] Graphical notation beautifully captures the symmetrical elements of this movement in one glance as can been seen in example 6.

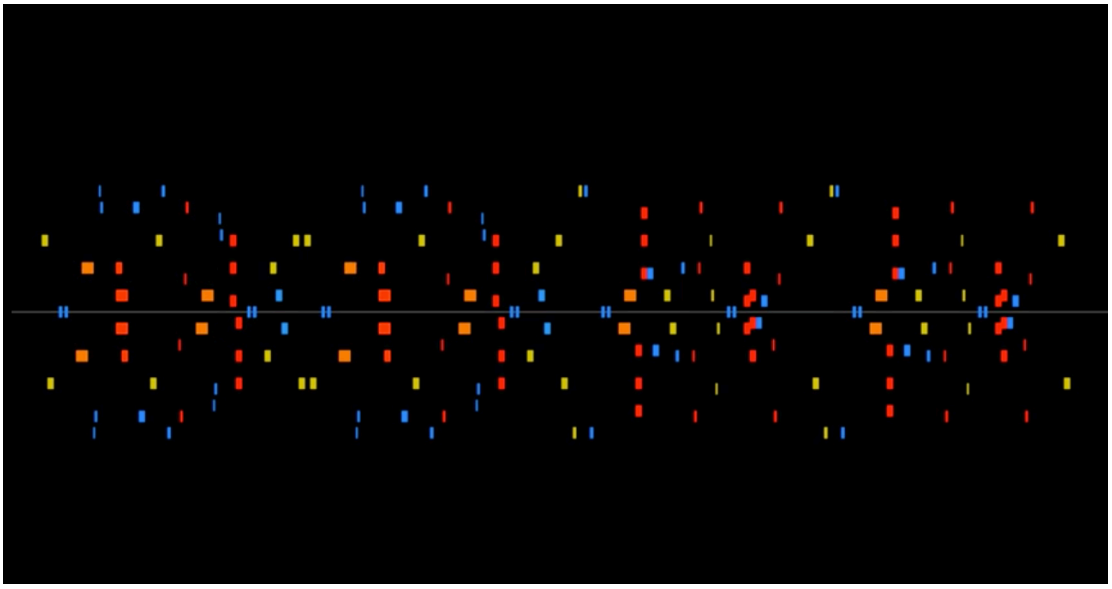
When comparing this movement to Bartók's first movement of *Music for Strings, Percussion, and Celesta*, some striking similarities emerge. Curiously, both pieces are composed in the same year, 1936, but more interestingly both pieces are structured

Example 5) Anton Webern, Piano Variations, Op. 27/II



[33] Bailey, *The Twelve-Note*, 112.

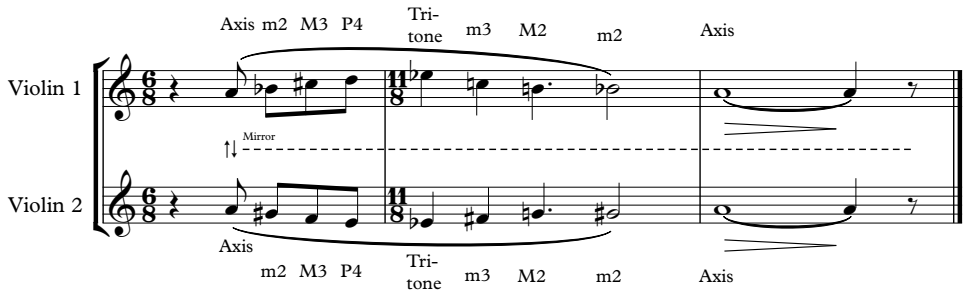
Example 6) Anton Webern, Piano Variations, Op. 27/II, Graphical notation[34]



around the same a' axis. The coda of the fugal first movement of Bartók's *Music for Strings, Percussion, and Celesta* (example 7), which can function as a summary of the entire piece, is the most evident case of a true vertical palindrome, again surrounding the axis on a'. Both violins move simultaneously with the same steps from the axis pitch towards the e♭' – which refers to the piece's climactic at measure 56 with the E♭ as the prominent sonority – and back to a'. This prominence of the E♭ is logical, since in any passage revolving around a certain axis it is at the tritone where a chromatic scale in contrary motion will intersect at the octave, making a tritone the counterpart of any axis pitch.[35] Conversely, Webern does everything to avoid the prominence of the E♭, by making it either a grace note (m. 6, 21) while also being the overlapping note between the last and the first note of a paired row form, or part of a trichord that also muddles its individual identity (m. 15).[36] By eliminating the importance of the tritonic counterpart of E♭, Webern's keeps a' as the definite tone centre throughout the piece. Since all the notes are pulling towards this a', this note can function as a new form of tonic. This new form of tonality by symmetrical structures will be explained a bit further on.

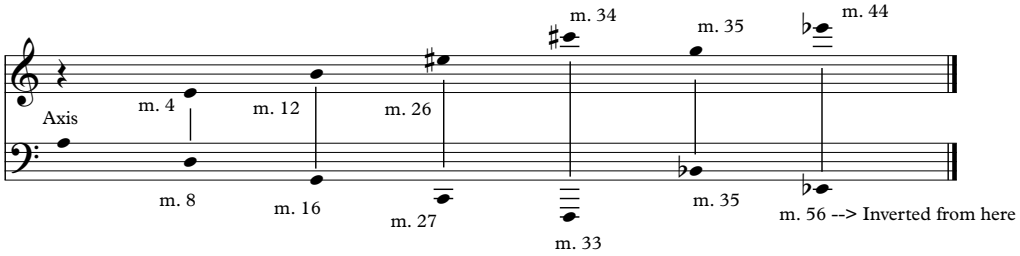
[34] Smalin," Webern, Variations for piano, opus 27 no. 2", (August 2015), Youtube video, 0:49, posted 02-08-15, https://www.youtube.com/watch?v=tb9IK4QpXuk. Notice the axis of a' as the mirroring line in the middle. The colors indicate the dynamics of the notes, which are mirrored as well.
[35] Taruskin, "Socially Validated," 388.
[36] Taruskin, "In Search of Utopia."

Example 7) Béla Bartók, *Music for Strings, Percussion, and Celesta*, I, mm. 86-88



The vertical symmetry of the coda of *Music for Strings, Percussion, and Celesta* movement I also reflects the remarkable array of the entire fugue, where each entry is symmetrically related to the axis of a', and it exemplifies how Bartók uses these vertical relations to structure a complete span of music (example 8). The subject entries, starting on A, strictly follow the circle of fifths in contrary motion, meaning that the second entry starts on E (a fifth higher than A), the third on D (a fifth lower than A), the fourth on B and so on, until they eventually intersect at the tritone at the climactic passage. Hereafter, the subject is presented in inversion and these inverted subject entries follow, again, a pattern of fifths in opposite direction – now revolving around the axis of E♭ – until they reach the home front of A at m.77. This A forms the entry of both the original (vl. 4) as the inverted (vl. 1) fugue subject, now set simultaneously yet not rhythmically aligned. The E♭ continues to form the axis, as clearly being stated by the second and third violins as well as the first viola. Mm. 82-85 consists of four fragments of the inverted and original subjects all starting on an A an octave apart, making each E♭ in between the axis, yet marking a return to A as the primary note. Since the subjects all overlap each other, the vertical palindromic structures do not occur simultaneously but are cultivated fugally, in full accordance with the entire movement. Only the coda at m. 86 portrays a simultaneous mirroring symmetry, as elaborated earlier.

Example 8) Béla Bartók, *Music for Strings, Percussion, and Celesta*, I, fugal entries



When spatial symmetry like that of *Music for Strings, Percussion, and Celesta* becomes the agent of the entire structure, its possible implications are important to examine. Christopher Mark advocates the idea that "spatial symmetry is the goal of the movement, articulated by the mirror statement of the last 3 bars."[37] The inexact mirror symmetry that makes up the most part of the fugue serves as a dynamic movement that works up to the eventual goal, the exact spatial symmetry. Although the symmetrical approach to the fugue is definitely a dynamic process, it seems hardly plausible that this is all just a preparation for the eventual goal, a three bar long coda. Rather than a goal, it seems more to evoke a summarizing quality of the contrary motion in spatial symmetry of the entire piece, departing on A (m.1) towards a climax on E♭ (m. 56) and returning back to A (m. 82). The fact that Bartók makes use of the golden section to mark pivotal moments in both the entire piece (the climax on E♭ in m. 56) and the coda (the return to A in m. 88) strengthens the summarizing effect.

One could ask why Bartók did not arrange the vertical palindrome of the summery in a fugal manner, which would be more in accordance with the overall piece. The answer of this seems to lie in the actual function of the spatial symmetry, that is the transmission of a new form of tonal route. Taruskin describes how Bartók eloquently demonstrates how the circle of fifths can be mapped onto the chromatic scale (the circle of semitones), with the tritone as the most remote entity, conveying this sense of climax or completion.[38] A sense of "out-and-back tonal trajectory, utterly different yet wholly analogous to the out-and-back trajectory of tonal music," is how Taruskin describes this.[39] Thus, the traditional tonal pathway that starts at the tonic, moves through the dominant before the return to the tonic is derivative for the movement of the opening axis of A that develops to its most remote point, E♭, after which it returns

[37] Christopher Mark, "Symmetry and Dynamism in Bartók," *Tempo* 183 (1992): 4.
[38] Taruskin, "Socially Validated," 400.
[39] Ibid.

home. Furthermore, a particular axis point becomes the main focus to which every other note pulls towards, granting the axis note a centripetal tonic quality. The passage in the coda seems to summarize this centripetal tonality in its most basic form, simultaneous note against note, almost reminiscent of an Schenkerian reduction. The spatial symmetry, thus, is not to be seen as the goal itself, but rather a means to a goal: an approach to a new tonal system with a new procedure to convey tonal hierarchy. As encountered earlier with the symmetrical harmonization of folk melodies, symmetry can function as a point of origin or destination.[40] This is the case here as well.

This connects the piece strikingly with Webern's op. 27/ii, with the important exception of the reduced role of the E♭. With the minimal function of the E♭, the tonal centre of A in op.27/ii becomes less ambiguous, even in a dodecaphonic setting where every note is deemed to be equal. To quote Taruskin: "We could not have a better illustration of the way in which the twelve-tone system was seen by its early practitioners not as a way of excluding pitch hierarchies (or "tonal" references), but as a way of asserting them in new, context-specific ways."[41] Or put even more rigidly by Wilbur Ogdon: "Webern in this movement was occupied with a very precise method of tonal centering. Functional tonality, of course, never attempted to select a pitch placement center (…) Webern, in the second movement of the Variations, is more precisely tonal than composers of harmonically tonal music."[42] A bold statement in itself, yet it perfectly demonstrates the very analogous strategy towards a new tonal system, and its underlying sense of unity, that Bartók employed in *Music for Strings, Percussion, and Celesta*.

The question rises whether this form of tonality is truly perceptible. One study show that in atonal music, "listeners' judgement of stability are influenced by the dissonance of chords and the horizontal movement of voices (…) salience (phenomenal accents), voice-leading, and dissonance are potentially important factors in the abstraction of relationships of relative structural importance, and hence to any inference of prolongational structure in atonal music."[43] Yet this experiment did not

[40] Perle, *Serial Composition*, 27.
[41] Taruskin, "In Search of Utopia."
[42] Wilbur Ogdon, "A Webern Analysis." *Journal of Music Theory* 6-1 (1962): 136.
[43] Nicola Dibben, "The Perception of Structural Stability in Atonal Music: The Influence of Salience, Stability, Horizontal Motion, Pitch Commonality, and Dissonance," *Music Perception: An Interdisciplinary Journal* 16-3 (1999): 265.

use the kind of centripetal atonal music described above. To test whether this new form of tonality is truly perceptible even for untrained ears, and whether it is a stronger guide for structural stability then the factors described above, more experimenting has to be done.

1.4 Cellular palindromic structures

1.4.1 Webern's cells

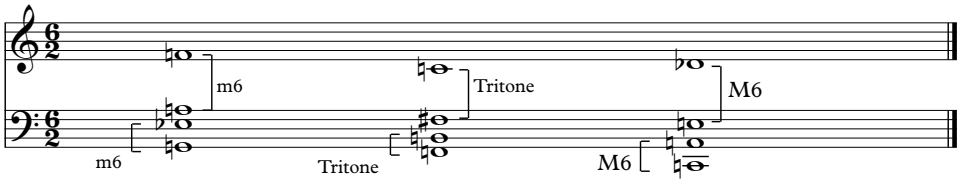
Because of its ability to convey a sense of unifying order, symmetrical structures are especially expedient to maintain a form of cohesion in any form of atonal music. It is, however, mainly in Webern's later dodecaphonic period where we find the most sophisticated examples of palindromes, and for this reason this period forms the main focus of the Webern analysis of this thesis. The debate about his earlier atonal work being merely preparatory to his dodecaphonic period transcends the scope of this particular thesis and will not be discussed.[44] However, there are examples of palindromic structures in Webern's atonal period that precede the more structural role it takes up in his twelve-tone music and are worth mentioning.

Bruce Archibald offers three apparent examples of symmetrical tetrachords in the second movement of Webern's Five Movements for String Quartet, Op. 5 (1909).[45] These three tetrachords consist of a particular interval that is being flanked by another interval that remains the same above and below the initial: successively, a minor sixth that embraces the tritone E♭-A, a tritone the perfect fifth B-F♯ and a major sixth the perfect fifth A-E (example 9).[46] Throughout his analysis, Archibald offers evidence that these symmetrical chords play a role in the inspiration for the additional pitch material of the movement, yet he admits that the symmetrical principles do not "account for every note in the movement any more than whole-tone relationships or

[44] Allen Forte strikingly proposes that we should correct our view that the atonal period is preparatory. See: Allen Forte, *The Atonal Music of Anton Webern* (New Haven and London: Yale University Press 1998).
[45] Bruce Archibald, "Some Thoughts on Symmetry in Early Webern: Op. 5, No. 2," *Perspectives of New Music*, 10-2 (1972): 159.
[46] Ibid.

any other single factor will."[47] It is clear however, that these symmetrical structures exist in this period of Webern, and "can be invoked to enhance, by means of the venerable concepts of expectation and fulfilment, an appreciation of the movement of music through time."[48]

Example 9) Anton Webern, Symmetrical Cells String Quartet, Op. 5



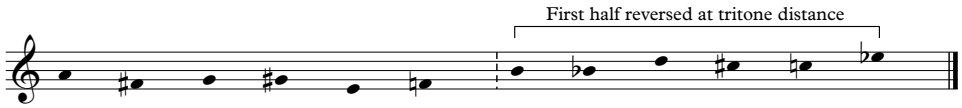
When composing dodecaphonic music, the construction of the 12-tone row becomes a fundamental pre-compositional thought process. For Webern this was, in four of his twenty-one dodecaphonic works, the first opportunity to convey palindromic relationships.[49] Conversely, a 12-tone row does not allow a repetition of the same notes in reverse, therefore an exact palindrome within the row is not possible, and thus the palindromic relationship has to be created in a different way. One way of doing so is by partitioning the row into smaller, symmetrical parts. Or this can be achieved in any row that is being paired with its own retrograde at a similar level of transposition, which is precisely what Webern did in his construction for the row of his Symphony, Op. 21.[50]

His two-movement Symphony, Op. 21 (1928) is based on a row that is in itself an intervallic palindrome since the second half reverses the first half at a tritone distance, and thus excludes the retrograde as an autonomous row form.[51] Webern limits hereby the total of possible independent row forms from forty-eight to twenty-four, allowing himself an even more economical approach. With the synthesis of this self-reversing row and a double canon in inversion in the first movement Webern achieves, with the

[47] Ibid., 162.
[48] Ibid., 163.
[49] David J. Hunter and Paul T. von Hippel, "How Rare is Symmetry in Musical 12-Tone Rows?" *The American Mathematical Monthly*, 110-2 (2003): 131; This research demonstrates that symmetrical rows constitute only 0.13% of all the possible rows. Webern used symmetrical rows in 4/21 works, which is ≈20%. This proves that the choice of symmetry is way above chance, making it a deliberate choice by Webern.
[50] Bailey, *The Twelve-Note*, 17.
[51] Taruskin, "In Search of Utopia."

words of Richard Taruskin, "a constant multidimensional intervallic symmetry," with a combination of the horizontal palindrome structures similar to those of Op. 27/i and the symmetrical axis structures op Op. 27/ii.[52]

Example 10) Anton Webern, Twelve-tone row: Symphony, Op. 21



An even more sophisticated example of Webern's engagement with symmetry in his pre-compositional stage is found in the row for his Concerto for nine instruments, Op. 24 (1931) on which he wrote to the poet Hildegarde Jone: "I have found a 'row' (that's the twelve notes) that contains already in itself very extensive relationships (of the twelve notes amongst themselves). It is something similar to the famous old proverb:

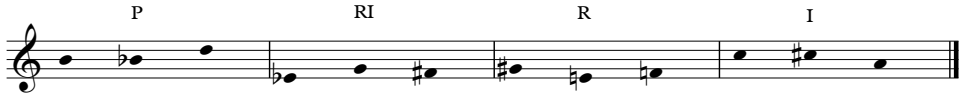
SATOR
AREPO
TENET
OPERA
ROTAS"[53]

This famous Latin palindrome works in multiple dimensions when arranged in a square, since one can not only read it from left to right (starting at the top) or right to left (starting at the bottom), but also from top to bottom (starting left) and from the bottom to the top (starting right). The row Webern constructed consists of one trichord and it's permutations (P-RI-R-I), all sharing the same intervallic shape; a semitone and a major third in opposite direction. This trichord forms not only the

[52] Ibid.
[53] Anton Webern, Hildegard Jone, Josef Humplik, Josef Polnauer, and Cornelius Cardew, *Letters to Hildegard Jone and Josef Humplik* (Bryn Mawr, Pennsylvania: Theodore Presser Company, 1967), 17f.

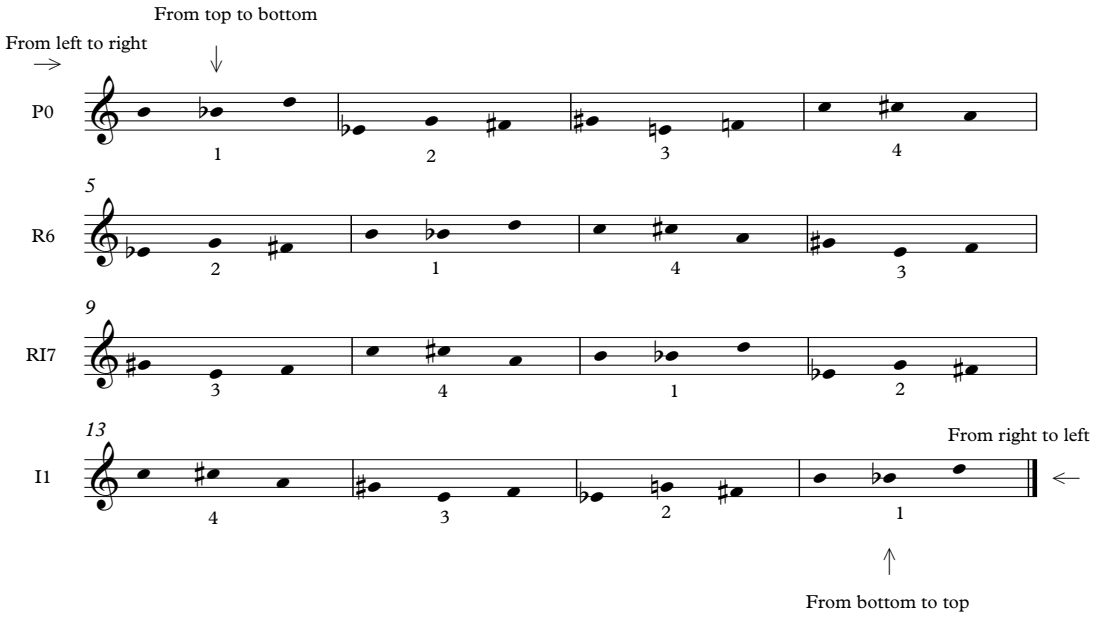
basis of the row, but also the basis of the entire piece, creating a "kaleidoscope of trichords."[54]

Example 11) Anton Webern, Twelve-tone row: Concerto for nine instruments, Op. 24



The reference to the square Latin palindrome becomes evident when the row is aligned with its permutations that contain the same four trichords of, yet in a different order than P0, namely R6, RI7 and I7 (example 12). Even though the obvious inspiration Webern drew from the Sator Square, there is a slight difference to be found between it and his rows. Webern's row forms consist of four trichords, while the words of the Latin palindrome consist of five letters, assigning a special significance to the letter N, which forms the multidimensional turning point. This turning point is missing in the row forms, which is an obvious consequence of the number of notes and trichords in the rows is even number and therefore doesn't allow one midway note or trichord.

Example 12) Anton Webern, Twelve-tone row Op. 24. Palindromic square

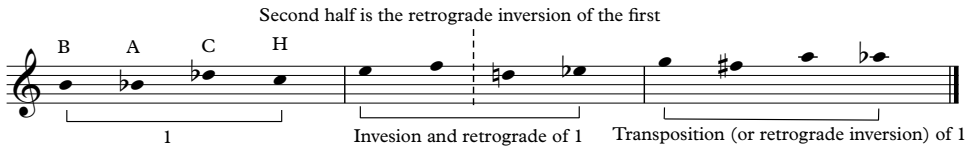


[54] Taruskin, "In Search of Utopia."

After abandoning the symmetrical construction of his rows, Webern returns to it with his most perfect symmetrical row yet, which he constructed for his String Quartet, Op. 28 (1937).[55] Like the previous example, the row is based on the permutations of a small figure, which in this case is a transposition of the famous BACH-motive (example 13). With the implementation of this well-known musical cryptogram he follows the declaration of loyalty to tradition of his teacher Schoenberg, who used it in his Variations for Orchestra Op. 31 (1928).[56]

The relationships in this row are remarkable due to the symmetrical quality of the BACH-motive itself, which causes the second tetrachord to be both the inversion and the retrograde of the first, and the third tetrachord a transposition or the retrograde inversion of the initial. Moreover, because of the arrangement of the tetrachords and the symmetrical aspect of the opening motive (P=RI), the second half of the row is the retrograde inversion of the first, making the row "identical to its own retrograde inversion, in this case at the ninth transposition."[57] Once again, Webern bisects the total of unique row possibilities, like in his Symphony, Op. 21.

Example 13) Anton Webern, Twelve-tone row: String Quartet, Op. 28. BACH-motive

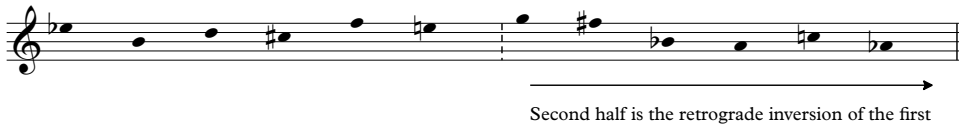


The same type of symmetry, where the hexachordal opening is equal to its retrograde inversion at a certain interval, can be found his two compositions that succeed Op. 28.[58] The row for the Op. 29 Cantata (1938) is, however, not as refined as the previous one since the row is not made up of a shorter, symmetrical, motive.[59] Conversely, the row for his Variations for Orchestra, Op. 30 (1940) is constructed by a tetrachord and its permutations, although this tetrachord entails no symmetrical structures. The Variations for Orchestra would become the last published composition that is based on a symmetrical row, though the piece Webern was working on when

[55] Bailey, *The Twelve-Note,* 25.
[56] Taruskin, "In Search of Utopia."
[57] Bailey, *The Twelve-Note,* 24.
[58] Ibid., 25.
[59] Ibid.

his life tragically ended in 1945 shows a reversion to the construct of the row of Op. 24, changing the order of permutations of the trichord to R, I and RI.[60]

Example 14) Anton Webern, Twelve-tone row: Cantata Op. 29



To conclude, these symmetrical organizations of the tone rows is according to Bailey primarily a result of Webern's fascination with symmetry, rather that his interest in the more general combinatoriality a twelve-tone row invites.[61] She states, correctly, "a symmetrically constructed row is of necessity combinatorial; the reverse need not be true."[62] Yet she does not take into account the combining factors that motivate these symmetrical constructed rows, the idea of unity and relatedness. To quote Webern himself:

> "Unity is surely the indispensable thing if meaning is to exist. Unity, to be very general, is the establishment of the utmost relatedness between all component parts. So in music, as in all other human utterance, the aim is to make as clear as possible the relationships between the parts of the unit; in short, to show how one thing leads to another."[63]

Webern's preoccupation with symmetrical relatedness in the construction of his rows demonstrates his fixation with unity, and the comprehensibility it produces, on a pre-compositional level. To Webern, there was already an elevated degree of unity in the twelve-tone row itself: "How has such an unusual degree of unity come about in twelve-note music? Through the fact that in the course of the row on which the composition is based no note may be repeated before all have occurred (…) And here the urge toward maximum unity found its fulfilment."[64] However, with the

[60] Ibid., 27.
[61] Ibid., 28.
[62] Ibid.
[63] Anton Webern and Willi Reich, *The Path to the New Music*, trans. Leo Black (Bryn Mawr: Theodore Presser Co, 1963), 42.
[64] Webern and Reich, *Path*, 53.

symmetrical construction of several of his rows, Webern strived for an even greater form of unity and relatedness, in the search of the musical equivalence of the, by Webern much appreciated, primeval plant of Goethe. To quote Webern once again: "To develop everything else from *one* principal idea! That's the strongest unity."[65] Especially with his tiny trichord that forms the basis of the row for his Concerto (Op. 24), and thus of the entire work, Webern is as close as he can get to an as strong as possible unifying relatedness caused by just a small musical seed.

1.4.2 Bartók's cells

Even though Bartók was not a dodecaphonic composer and therefore had no pre-compositional device as strict as a twelve-tone row, there seems to be a regular occurring cellular structure that is symmetrically induced. An important insight this aspect of Bartók's music is George Perle's discovery of the use of and interaction between two symmetrical tetrachords in the Fourth Quartet.[66] The first consists of C-C♯-D-E♭, which he calls Set X (borrowing the term set from the dodecaphonic theory), and the second he calls Set Y and consists of B♭-C-D-E.[67] Set X, in linear form, mainly outlines the melodic figure of the entire Quartet while both Set Y and X shape the polyphonic passages.[68] A third symmetrical set, the Set Z, was revealed by Leo Treitler and consists of G♯-C♯-D-G which is equal to a type of chord already discovered by Lendvai.[69] It was Antokoletz who demonstrated that the interrelations of these three sets exceeds the structure of merely the Fourth Quartet as he provides evidence of its existence in several pieces including Bagatelle No. VIII, the First and Second String Quartet and *Music for Strings, Percussion, and Celesta*.[70]

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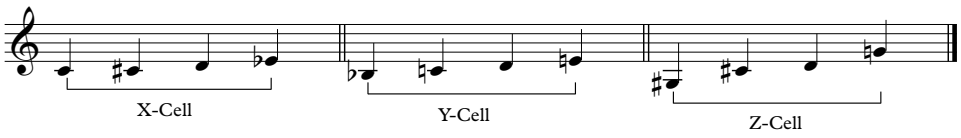
[65] Webern and Reich, *Path*, 35.
[66] George Perle, "Symmetrical Formations in the String Quartes of Béla Bartók," in *The Right Notes: Twenty-Three Selected Essays by George Perle on Twentieth-Century Music*, ed. George Perle (Stuyvesant, NY: Pendragon Press, 1995), 201.
[67] Ibid.
[68] Ibid., 202.
[69] Leo Treitler, "Harmonic Procedures in the Fourth Quartet of Béla Bartók," *Journal of Music Theory* 3-2 (1959) 292-98. Lendvai notices a frequent use in groups of chords with the structures 1:5, 1:3 and 1:2, which he relates to the golden section proportion 5:3:2, see: Lendvai, *Béla Bartók*, 51.
[70] For a detailed analysis of these aspects see Antokoletz, "Construction, Development and Interaction of Intervallic Cells," in *The Music of Béla Bartók*, 78-137.

Example 15) Béla Bartók's cells, as analyzed by Perle and Treitler



Important to note is that, again, these extrapolated cells form palindromic ingredients, which can be deployed in several strategies to achieve different goals with a certain amount of freedom. The writings of Perle, Antokoletz and Treitler focus for a great deal on "analogies between these abstract procedures and tonal ones."[71] Perle defines the different positions of the sets in terms of "dominant key", "foreign key" and "subdominant key", clearly searching the analogy with the traditional major-minor system.[72] Furthermore, he concludes his essay with a bold statement, which is worthy of quoting in full length:

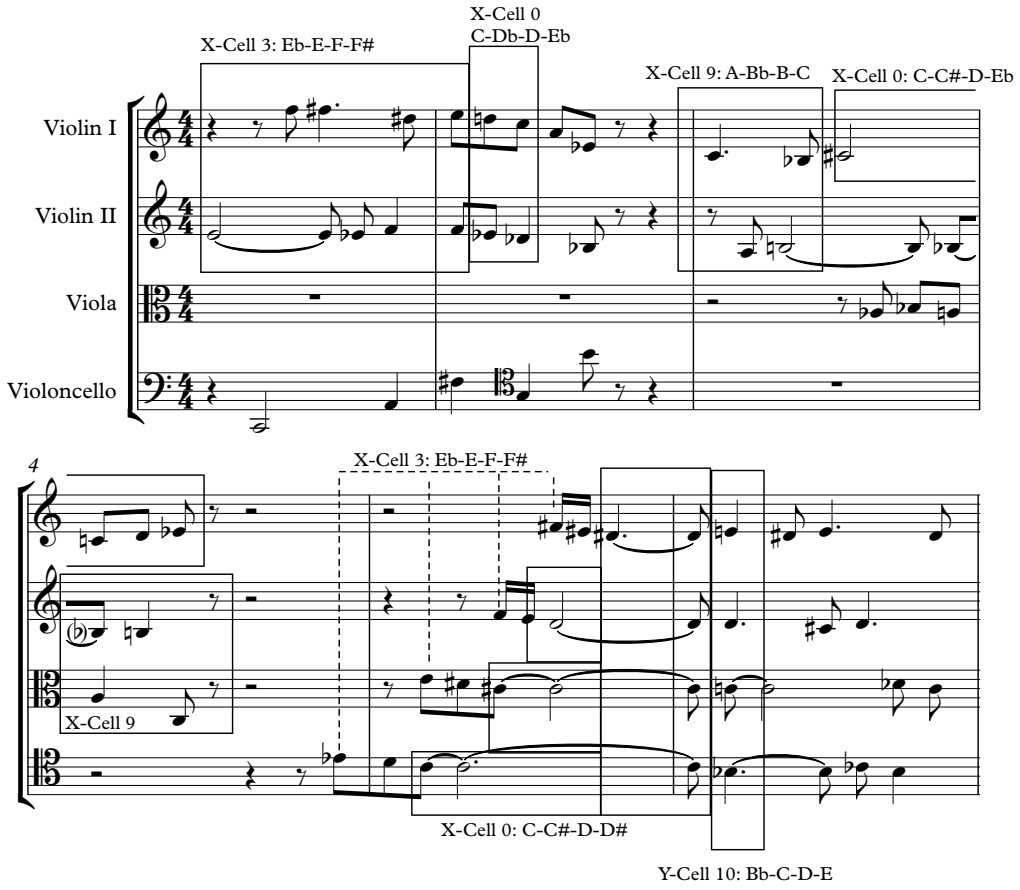
> "Impressive as these procedures are, it must be observed that Bartók's symmetrical formations are only an incidental aspect of his total compositional means. Even in those few works where they perform a significant structural role they do not ultimately define the context, which is determined instead by a curious amalgam of various elements, by an eclecticism seemingly inconsistent with the overwhelming unity of design and intensity of expression of the musical effect. Can symmetrical formations generate a total musical structure, as triadic relations have done traditionally? The implications of Bartók's work in this, as in other respects, remain problematical."[73]

However, as analyses have pointed out, symmetrical relations are all too evident in Bartók's music to express them as incidental aspects. The intervallic palindrome sets discussed above are evidence that, in the music of Bartók, symmetry plays a

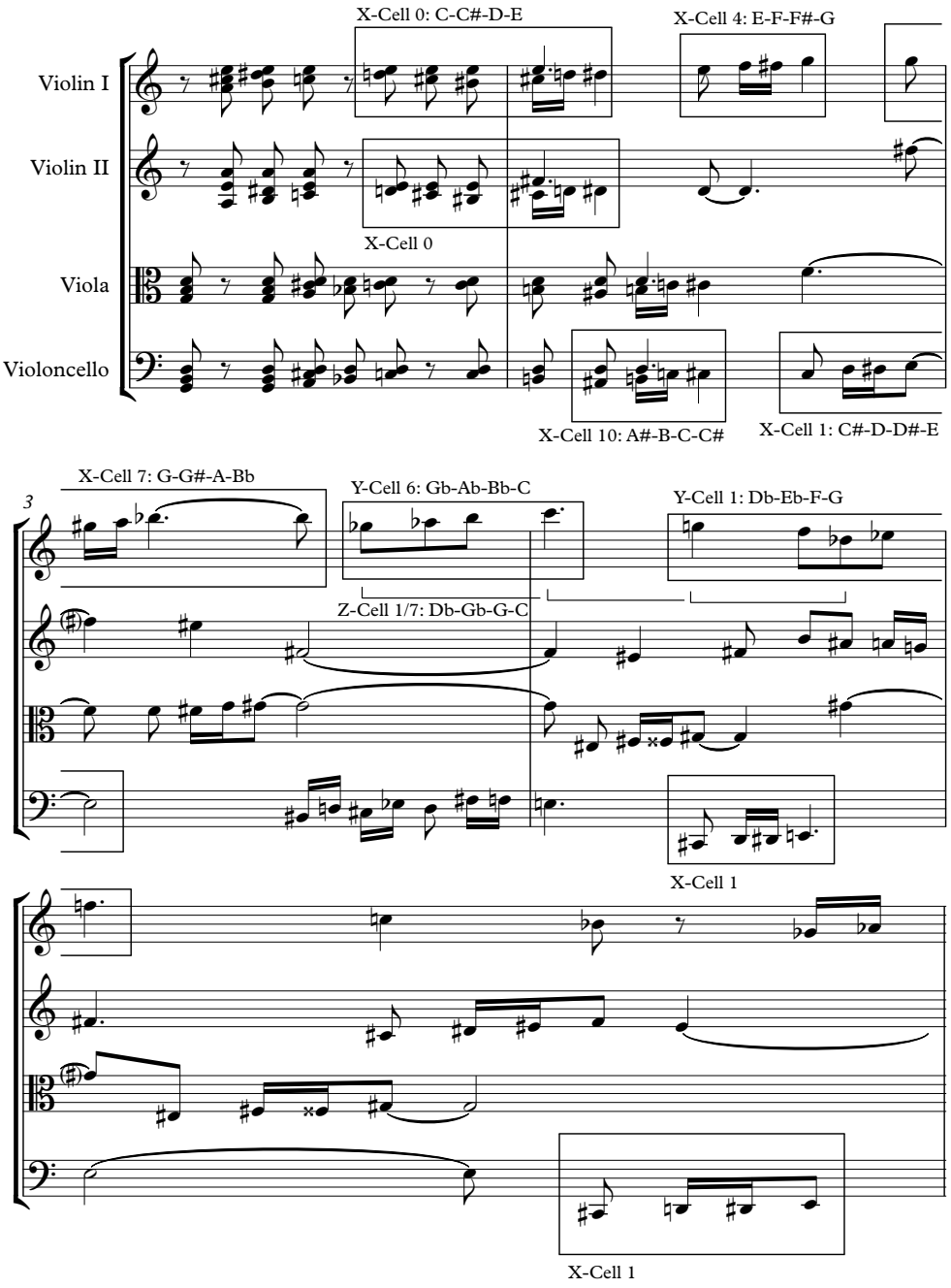
[71] Ivan F Waldbauer, "Analytical Respones to Bartók's Music: Pitch Organization," in *The Cambridge Companion to Bartók*, ed. Amanda Bayley (Cambridge: Cambridge University Press, 2010), 223.
[72] Perle, "Symmetrical Formations," 205; notice the careful references to the traditional system with his use of the quotation marks.
[73] Ibid.

significant role even on a cellular level, similar to the symmetrical relations of certain rows of Webern. And surely eclecticism is a vital aspect in Bartók's musical language, as we have especially seen in his synthesis of folk music and modernism, his use of the golden section and his search for a new tonal system. Yet it seems strongly feasible that symmetrical formations, from the smallest to the largest of settings, makes up a large part of this eclectic style and with its exceptional quality of creating relatedness it seemingly contributes to the overwhelming unity of design that Perle speaks of. The following examples of Bartók's Fourth String Quartet (1928) demonstrate how these cells are used and interact with each other.

Example 16) Béla Bartók, Fourth String Quartet, I, mm. 1-6



Example 17) Béla Bartók, Fourth Strng Quartet, I, mm. 38-42



To conclude, the different implementations of palindromic structures by both composers proof not only their captivation with the phenomenon itself, but also the search towards a decisive structural element that maintains coherence and stability in music that excludes tonal and contrapuntal voice leading.[74] This idea of unity, already briefly encountered in the writings of Webern, is worth discussing in detail since it

[74] Arnold Whitall, "Webern and Atonality: The Path from the Old Aesthetic," *The Musical Times* 124 (1983): 737.

can form a bridge between the ideologies of our two composers and the validation of their music in the Western history of music.

Part 2. Musical Unity & Organicism

2.1 Goethe & Schenker

"You'll already have seen where I am leading you. Goethe's primeval plant; the root is in fact no different from the stalk, the stalk no different from the leaf, and the leaf no different from the flower: variations of the same idea."[75]

In 1932 and 1933, Webern gave sixteen lectures about his path towards new music, which were collected and transcribed by his private pupil Willi Reich. In these lectures, Webern safely paves the way to his new music by fitting it into a tradition where unity, not tonality, plays the decisive role in music: "Great composers have always striven to express unity as clearly as possible. *One* means of doing it was tonality. Another was provided by polyphony. (…) This urge to create unity has also been felt by all the masters of the past."[76] Such unity in music provides a sense of comprehensibility and coherence irrespective of the musical style or period. Whether it is in Gregorian chant, the music of the Netherlanders, Bach's fugues, Brahms' variations or dodecaphonic music - to Webern, unity is the ultimate bond that binds great music together.

Webern relates his strive to unity to Goethe's idea of art "as a product of nature in general, taking the particular form human nature."[77] Webern himself expresses this idea even more rigidly when he states: "man is only the vessel into which is poured what 'nature in general' wants to express."[78] At first sight this seems to put any composer in an extremely passive position, but he continues: "just as a researcher into nature strives to discover the rules of order that are the basis of nature, we must strive to discover the laws according to which nature, in its particular form 'man,' is

[75] Webern and Reich, *Path*, 53.
[76] Webern and Reich, *Path*, 52-3.
[77] Ibid., 10.
[78] Ibid., 11.

productive."[79] To better understand these laws, he quotes Goethe: "These high works of art were at the same time brought forth as humanity's highest works of nature, according to true and natural laws. Everything arbitrary or illusory falls away; here is necessity, here is God."[80] Webern then relates the idea of necessity to music, where there should also be "no trace of arbitrariness! Nothing illusory!"[81] This finally leads to Goethe's primeval plant, described by Webern in the opening quote to this chapter.

Webern's reference to this primeval plant, which symbolizes the relatedness and unity of the parts that make up a whole, puts him in another tradition. One that can be traced back as far as Plato and Aristotle and which describes various aspects of human history, society and experience in organic terms.[82] However, it surfaced especially in the late eighteenth and nineteenth centuries as part of the aesthetic critical discourse.[83] Stephen Pepper gives a clear definition of this organicism that in his case originates from the school of literary criticism:

> "There are two qualitative dimensions that yield organistic standards of beauty–the degree of integration and the amount of the material integrated. … The maximum of integration is a condition where every detail of the object calls for every other… Or negatively, it is a condition where no detail can be removed or altered without marring or even destroying the value of the whole. Such a whole is called an organic unity."[84]

Organicism gradually found it's way in music analysis as well, with the achievements of Heinrich Schenker as the most well known.[85] In his innovative analytic work he promotes the idea of a certain generative force that drives the composition.[86] This force comes forth from the major triad, which is evidently found in the natural

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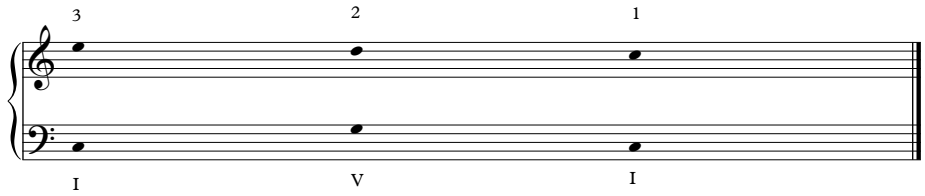
[79] Ibid.
[80] Goethe in Webern and Reich, *Path,* 11.
[81] Webern and Reich, *Path*, 11.
[82] Ruth A. Solie, "The Living Work: Organicism and Musical Analysis," *19th-Century Music* 4-2 (1980): 147.
[83] Ibid.
[84] Stephen C. Pepper, *The Basis of Criticism in the Arts* (Cambridge, Mass: Harvard University Press, 1945), 79.
[85] In his article Heinrich Schenker, Anti-Organicist, William A. Pastille interestingly describes how Schenker, in his younger years was not an organicist. Yet his later idea of the *Ursatz* makes him stand out as one of the most important organicists today. See: William A. Pastille, "Heinrich Schenker, Anti-Organicist," 19th-Century Music 8-1 (1984), 29-36.
[86] Solie, "The Living Work," 151.

overtone series: “Even the octave, fifth, and third of the harmonic series are a product of the organic activity of the tone as subject, just as the urges of the human being are organic.”[87] These urges form the basis of Schenker’s main concept, a fundamental structure that is generative for the composition and universal in tonal music, the *Ursatz*:

> “All transformatios presume a final unalterable nucleus: in man, it is character, and in compositin it is the urlinie.
> Just as there is only one line, there is only one consummation of it. The urlinie is, to employ a concept of Leibniz, the pre-stabilized harmony of the composition.”[88]

This pre-stabilized harmony is comprised of a fundamental line accompanied by the bass arpeggiation and forms the background framework of any tonal piece and this is where organic unity is achieved. There is case of “a totality of integration in which all of the musical elements function actively and completely toward the necessities of the whole,” which is Schenker’s criteria of musical value.[89] Noteworthy to mention is that, contrary to what many critics propose, it is not Schenker’s goal to demonstrate that any tonal work can be reduced to the same fundamental structure. The goal is to show how any tonal work particularizes the fundamental background, maintaining an individual approach towards the unifying structure. This is vital for Schenker as proved by his motto “always the same, but never in the same manner.”[90]

Example 18) Heinrich Schenker, minimal Ursatz



[87] Heinrich Schenker, *Free Composition (Der freien Satz): Volume III of New Musical Theories and Fantasies,* trans. Ebst Oster (Hillsdale, NY: Pendragon Press, 1979), p. 9.
[88] Schenker, “Resumption of Urlinie Considerations,” in Sylvan Kalib, “Thirteen Essays from the Three Yearbooks, Das Meisterwerk in Der Musik, by Heinrich Schenker: An Annotated Translation, Volume 2” (Ph.D. diss., Northwestern University, 1973), 144-45.
[89] Sonia Slatin, “The Theories of Heinrich Schenker in Perspective” (PhD diss., Columbia University, 1967), p. 495.
[90] Schenker, *Free Composition*, 6.

Important to note is that Schenker's organic concepts deal with tonal music and therefore the music of Webern and Bartók does not strictly fit into this principle. Yet the idea of a fundamental structure that provides the organic coherence of the whole is, as demonstrated, very evident in the creative output of Webern and Bartók. However, Schenker states that with musical language in general "the quest for a new form of music is a quest for a homunculus. But nature will endure, indeed, will conquer, in music also; she has revealed herself in the works of the masters and, in this form, she will prevail."[91] Here Schenker advocates that tonal music is the musical product of nature par excellence and does not seem to believe that a search for a new homunculus is to be successful. A homunculus that is not a product of nature, that is. And since he states that tonal music will be prevail, it is likely that he might disdain the quest for a homunculus that Webern and Bartók performed. However, in their search for a homunculus, Webern and Bartók are heavily inspired by nature as well, as will be explained in detail later. This forms an important connection that positions their music in a tradition where organic unity that is motivated by nature is the fundamental musical principle.

2.2 Reti & Robinet

A different approach to musical organicism is that of musical analyst Rudolph Reti as he favours metaphors of growth, development and evolution over the idea of a universal urlinie.[92] In these metaphors, Reti gives special importance to thematic connections, which "through its key relationships, become one great expression of its basic motiv."[93] This developmental growth approach to musical organicism lends itself well for musical analysis, since a musical work itself consists of certain developments occurring in time.[94] Furthermore, organicists compare this developmental process in music with the goal-oriented pattern of organic growth. And here lies a shared entelechy, which biologists called the "vital force," and Reti calls the "inner force" of music.[95] Music in this ideology has an autonomous inner life, like

[91] Ibid., 9.
[92] Solie, "The Living Work," 152.
[93] Rudolph Reti, *The Thematic Process in Music* (London: Faber and Faber, 1961) p. 223.
[94] Solie, "The Living Work," 152-3.
[95] Ibid, 154-5.

the *Ursatz* of Schenker or Reti's thematic pattern that "moves by transformation toward a goal."[96]

This autonomous inner life seems to put the composer in an ambiguous position, similar to the words of Webern discussed above. The musical organism develops itself through its inner force and the composer is merely the one who gives birth. This fits the view of the genius in the romantic period as being an entity unlike any other. One that "was indeed considered organic itself, born and not made."[97] This view seems to disregards any deliberate choices in the musical structure that a composer makes and is therefore to be criticized. However, both Webern and Bartók drew their inspiration to a large extend from nature, as will elaborated a bit further on, making the music their sonorous manifestation of nature. Yet, this still asks for many intellectual, deliberate choices, and to put that a musical work develops itself through its autonomous inner life is taking away to much credit from the composers.

Similar to Reti's idea of thematic process is the organistic concept by the French naturalist Jean Baptiste Robinet. A synthesis between these two ideas is particularly suitable to analyze the organic elements in the music of Webern and Bartók. Robinet developed his idea already twenty years before Goethe described his primeval plant. His notion was not that of an *Urplantz* like Goethe's, but a smaller element, a cell, that is destined to develop into higher forms.[98]

> "All beings differ one from the other, but all those differences constitute natural variations of a prototype that may be regarded as the generating element of all beings. … It is a gem [cell, monad] that has a natural tendency towards self-development. … The cell develops itself thus, and every level of development produces a variation of the prototype–a new combination of the fundamental universal plan. Each level provides passage to a successive level. …"[99]

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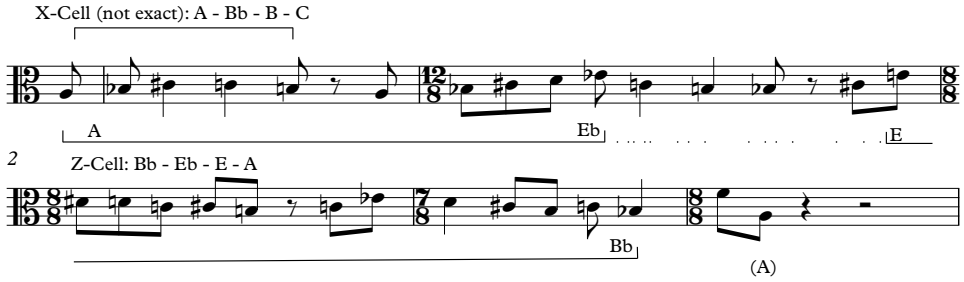
[96] Solie, "The Living Work," 155; Reti, *Thematic Process*, 139.
[97] Solie, "The Living Work," 156.
[98] David L. Montgomery, "The Myth of Organicism: From Bad Science to Great Art," *The Musical Quarterly* 76-1 (1992): 18.
[99] Jean Baptiste Robinet in Montgomery "The Myth of Organicism," 18. Original quote from: "De la nature 4:7, 8:17. De l'unité & des variétés du systême naturel de l'Etre. De l'Etre prototype de tous les Etres. Translated by David L. Montgomery.

The metaphor of generating cells lend themselves effortlessly to draw analogies between organic life and forms of motivic transformation. These metaphors are particularly ubiquitous in nineteenth-century German discourse on art, literature, and music.[100] In this there is a connection with the music of Bartók and Webern. The symmetrical cells of Bartók and the twelve-tone rows in general perfectly fit into Robinet's organic metaphor. These collections of notes form the foundation of much larger forms, "a potent but simple source from which multiplicity arises."[101] In Bartók's case this does not have to be one source since the cells can, to ensure development but keeping cohesiveness as well, interact throughout a piece. The twelve-tone row is eminently suitable for creating a prototype that forms the unifying factor for an entire piece. Webern took this even further, especially in the partitioning of the row in his Op. 24, which was inspired by the Latin square palindrome. Here one trichord forms the cell that develops the remainder of the row, and eventually the entire piece.

These cells are eventually generative for thematic processes as well, and when combining this cellular idea of Robinet with the organic concept of Reti we can get a clearer view of the organic quality of the music of Webern and Bartók. The fugue subject of *Music for Strings, Percussion, and Celesta* is a good example, since it is comprised of notes of the Z-cell, and the subject itself forms the theme from which the rest of the piece is developed.

Example 19) Béla Bartók, *Music for Strings, Percussion, and Celesta*, I, mm. 1-5. Fugue subject and cells



[100] Montgomery, "The Myth," 24.
[101] Ibid., 40.

2.3 Schoenberg & Nature

The question remains why Webern and Bartók drew so heavily upon palindromic formations, since cells don't necessarily have to be symmetrical to convey unity in a piece. One answer, already discussed above, is the possibility of the replacement of traditional tonality. Another can be found in the ideology of Arnold Schoenberg and is particularly plausible in Webern's case. In his essay about twelve-tone composition, Schoenberg writes that "the two-or-more-dimensional space in which musical ideas are presented is a unit."[102] A musical idea, thus, always takes place in the horizontal and vertical dimensions simultaneously and "functions not only in its own plane, but also in all other directions and planes, and is not without influence even at remote points."[103] This formulates the rule of twelve-tone composition, where a basic set of twelve tones can be used in its retrograde and inversion forms, unifying the horizontal and vertical dimensions. Schoenberg is then formulates this unity of musical space as follows: "the unity of musical space demands an absolute and unitary perception."[104] Inspired by Swedenborg's heaven, described in Balzac's *Seraphita*, there is no "absolute down, no right or left, forward or backward," in this unity of musical space.[105] The perception of a musical idea behaves in the same manner as the perception of a material object according to Schoenberg:

> "Just as our mind always recognizes (…) a knife, a bottle or a watch, regardless of its position, and can reproduce it in the imagination in every possible position, even so a musical creator's mind can operate subconsciously with a row of tones, regardless of their direction, regardless of the way in which a mirror might show the mutual relations, which remain a given quality."[106]

A musical idea that exists in space is thus recognizable regardless of the way we encounter it, just like an object remains recognizable regardless its dimensional

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[102] Arnold Schoenberg and Leonard Stein, *Style and Idea: Selected Writings of Arnold Schoenberg*, trans. Leo Black (London: Faber and Faber, 1975), 220.
[103] Schoenberg and Stein, *Style and Idea*, 220.
[104] Ibid., 223.
[105] Ibid.
[106] Ibid.

position. Whether this is truly aurally perceptible in twelve-tone music is debatable, especially since composers enjoy great freedom when it comes to octave placement. Such octave equivalence is much more a mathematical equivalence than a musical one.[107] As music psychologist Paul Pedersen puts it: "random octave equivalence of the numbers of a series of twelve different pitch classes destroys the perceptibility of the series (…) The composer cannot assume that because a technique is logically consistent that it will necessarily result in perceptible sound structures."[108] One can thus argue how recognizable a musical idea in this unity of musical space of Schoenberg indeed is, yet the philosophy remains an important factor to consider in Webern's music.

The palindromic structures of especially Op. 27/i demonstrate elegantly how this unity in space can achieved, at least visually and mathematically. Discussed above, the constant relation between the prime and the retrograde form and the true palindrome of the opening measures in particular are most reminiscent of Schoenberg's idea of unity in musical space. In these palindromic passages there is no absolute left or right and since the right and left hand exchange their roles at m. 13 in retrograde, the vertical dimension is unified as well, yet less exact. The second movement of this work demonstrates a unity in vertical dimension in an exact manner. As mentioned above, every pitch that occurs below the axis of a' is being follow with the exact same interval above and vice versa. The sense of up and down here is being symmetricalized, justifying Schoenberg's unity of musical space. The vertical symmetries of Bartók encountered above can fit into this idea as well. Taruskin also states that Bartók, like Schoenberg, has "emancipated the dissonance," since just like Schoenberg's atonal utopia, there is "no absolute up or down, right or left."[109]

However, Schoenberg's analogy of an object in a certain space does not easily lend itself for music, since music takes place in and develops over time. Yet, Schoenberg's idea demonstrates the issue that vertical relationships in themselves are of vital importance. Music takes place in a "space-time continuum," where, as Morag Josephine Grant puts it, "composition need no longer be based on the horizontal, linear connections of thematicism and voice-leading; vertical events, in and for

[107] Barbara R. Barry, *Musical Time: The Sense of Order* (Stuyvesant, NY: Pendragon Press, 1990), 178.
[108] Paul Pedersen, "The Perception of Octave Equivalence in Twelve-Tone Rows," *Psychology of Music* 3-2 (1975): 3-8.
[109] Taruskin, "Socially Validated," 414.

themselves, are also of prime importance."[110] The palindromic structures discussed are a perfect example of the importance of the vertical events.

However, already hinted at a several times above, a stronger connection between Bartók and Webern and a motivation of their use of palindromic is found through their mutual interest in nature. Bartók was a collector of plants, insects, minerals and paid great interest in the regularities in sunflowers and fir-cones and he once said; "we follow nature in composition."[111] He even regarded the Hungarian folk music as a product of nature: "Peasant music, in the strict sense of the word, must be regarded as a natural phenomenon (…) It is just as much a natural phenomenon as, for instance, the various manifestations of Nature in fauna and flora."[112] This idea of nature as musical guide was also encountered above in the words of Webern. He too was an active nature admirer through two life-long passions: mountaineering and gardening.[113] Furthermore, as mentioned above, he followed Goethe's view of art as a product of nature. A key aspect that seems to bind the two composers in the inspiration they drew from nature is symmetry.

In his article, Alexander V. Voloshinov says "symmetry is the universal principle of nature, the principle permeating the whole universe and revealing its unified picture from the atomic nuclei and molecules to the solar system and the metagalaxy."[114] It becomes clear here that symmetry exists in nature at the smallest micro and largest macro levels. As demonstrated above, the cells that develop in the music of Bartók and Webern are symmetrically constructed; mirroring the symmetrical atomic nuclei Voloshinov speaks of. Symmetry at a macro level is found in the palindromic ordering of the movements in several works of Bartók discussed in chapter 2.2 as well as the symmetrical thematic ordering in Webern's second movement of his Symphony, Op. 21.

Furthermore, Voloshinov describes the relationship of this symmetry as found in nature and symmetry as an aesthetic quality of art and he concludes that:

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[110] Morag Josephine Grant, *Serial Music, Serial Aesthetics: Compositional Theory in Post-War Europe* (Cambridge: Cambridge University Press, 2001), 113.
[111] Bartók in Ernö Lendvai, *Béla Bartók: An Analysis of his Music* (London: Kahn and Averill, 1971), 29.
[112] Bartók and Suchoff, *Béla Bartók Essays*, 321.
[113] Julian Johnson, *Webern and the Transformation of Nature* (Cambridge: Cambridge University Press, 1999), 2.
[114] Alexander V. Voloshinov, "Symmetry as a Superprinciple of Science and Art," *Leonardo* 29-2 1996): 109.

> "Analysis of such objective laws of beauty as geometrical symmetry, proportion, the golden section, rhythm and approximate symmetry from the position of the symmetry principle allows one both to make a conclusion about an integral foundation of these laws and to draw a general philosophical deduction about a global function of the symmetry principle in art and in the universe. In his Nobel Prize lecture, E. Wigner called symmetry the superprinciple of physics. A unification of the objective laws of beauty on the basis of the symmetry principle makes it possible to call symmetry the superprinciple of art as well."[115]

With examples throughout the human history of art, he demonstrates how the objective laws of symmetry form a fundamental tradition of aesthetics in art. The last of the five objective laws of beauty Voloshinov describes, is the conception of approximate symmetry. This is of vital importance in art, since exact symmetry in art can be perceived as static and frigid.[116] As Stravinsky once said: "To be perfectly symmetrical is to be perfectly dead."[117] And as nature itself allows small flaws in its symmetrical constructions, art may, for the sake of maintaining enlivenment, do so as well.[118] For this reason, it is logical that any inconsistencies in the symmetrical structures of Bartók and Webern are allowed for the sake of musical dynamism. Moreover, it is the dynamic relationship between symmetry and asymmetry that seems to be the main principle in the musical language of Bartók and Webern. In this, symmetry seems to maintain coherence in an asymmetric, atonal environment. According to Theodor Adorno asymmetry in its artistic value is only understood in its relation to symmetry.[119] Furthermore, the aesthetic quality of asymmetry is probably best when the symmetry that lies underneath it is still clear.[120] In this view, the palindromic symmetries Bartók and Webern used are a foundation to which they add asymmetries to maintain enlivenment and dynamism, mirroring the symmetrical

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[115] Ibid., 112.
[116] Ibid., 111.
[117] Igor Stravinsky and Craft Robert, *Conversations with Igor Stravinsky*, (Garden City, N.Y.: Doubleday, 1959), 16.
[118] Voloshinov, "Symmetry as a Superprinciple," 111.
[119] Theodor W. Adorno, *Aesthetic Theory*, trans. Robert Hullot-Kentor (London: Continuum, 1997), 158.
[120] Adorno in I.C. McManus, "Symmetry and Asymmetry in Aesthetics and the Arts," *European Review* 13-2 (2005), 157.

inconsistencies in nature. This foundation is particularly evident in the symmetrical row partitioning of Webern, and the symmetric cells Bartók used. The vertical symmetric fugal entries of *Music for Strings, Percussion and Strings* are a great example of this as well.

However, the idea that music follows nature can be somewhat arbitrary, since music is above all a human cultural product. It is true that composers are inspired by nature, but an important distinction has to be made whether music mimics nature or reflects certain aspects of it. Several composers have mimicked nature with the imitation of birdsongs for example. Yet one would not argue that the creative output of Webern and Bartók mimic nature. Rather, they incorporate natural laws in their works to synthesize their own modern musical language. Julian Johnson states in his book about Webern and nature that these natural laws are based on a social construction of nature, rather than nature itself:

> "(…) Webern's music relates to a social construction of nature that is central to the European society of which he was part. It does not merely reproduce or reflect a discourse on nature carried out in other cultural mediums – it creates its own specific mediation of tis discourse and thereby its own critical stance. Music, as a particularly potent cultural force, shapes the perception of the world."[121]

To say that Webern and Bartók truly follow nature in their compositions is thus inaccurate. Rather, they follow the social construction of nature through their own personal conception of natural laws. This is why the shared inspiration of nature led to the seemingly distinct styles, with the law of symmetry as the essential binding factor.

[121] Johnson, *Webern and the Transformation*, 234.

Conclusion

"So we want to fathom the hidden natural laws in order to see more clearly what is going on today. Then we shall have covered the path to the new music."[122] – Webern

In the discussed lectures of Webern, he frequently refers to a musical tradition where unity, relatedness and organic metaphors are the fundamental principles in composition. These hidden natural laws seem to pave the path to the new music he speaks of. And with this he seems to frame and validate his own musical language into the Western musical history.

As demonstrated, his search of organic unity largely consists of the frequent use of symmetry, especially through palindromic structures. This forms a striking connection with the music of Bartók, who employed palindromic structures in his musical language as well. Both composers incorporate palindromes in the vertical and horizontal dimension, resulting in Schoenberg's unification of musical space. The sense of up and down, left and right is truly being unified. In this, vertical relations are equal to the horizontal development in the musical space-time continuum.

The use of palindromic structures is also an important factor in their search of unity, especially palindromes at the smallest level. In Bartók these are the intervallic symmetrical X, Y and Z cells and in Webern these are primarily the symmetrical constructions of his twelve-tone rows. These cellular palindromes fit into the main concepts of musical organicism, unity and growth. The idea that a particular fundament forms the model for an entire musical piece is the essential concept of organicists like Schenker and Reti. This fits Bartók and Webern into a tradition where the concept of organic unity is a principle compositional goal. In a century where tonality became less and less used, these palindromic structures are especially suitable to can maintain coherence and organic unity.

The special interest of Bartók and Webern in symmetry can be found through their mutual interest in nature as well. This seems to bind the two

[122] Webern and Reich, *Path*, 12.

composers the most. Since symmetry is a very common phenomenon in nature, it is only logical that they drew inspiration from this. To say that their music reflects nature may seem arbitrary, yet the shared passion about nature and their widely used symmetrical structures seem to go hand in hand in the synthesis of their musical languages.

Once again, it seems that the path to new music mainly consists of synthesises between new musical systems and traditional concepts. After all, nobody works inside a vacuum.

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List of examples: