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## TELEOLOGICAL STRATEGIES IN *OCTANDRE* BY EDGARD VARÈSE

**Abstract:** The objective of this work is the discovery and analysis of teleological strategies, i.e. the ways in which music which is not tonal-oriented finds points of orientation, how it is structured around them and directed towards them as formal supports. A modernist composition *Octandre* by Edgar Varèse which is composed for seven wind instruments and double-bass will serve as an analytical sample. An important element of the composition is the use of sound masses as basic building units, whose expressive meaning is within the general character of the sound, and not in the concrete melodic content. Seemingly, the relevance of individual pitches is minimized, which could indicate the possible statics and absence of goal-oriented movement. However, the analysis has discovered an orientation towards certain goals, as well as the crucial importance of parameters of pitches during the process of their realisation.

By tracking these processes, as well as by analyzing the sets from which the sound masses of the work are built, it will be concluded that the analyzed work rests upon advisedly elaborated compositional strategies that make its course targeted.

**Key words:** posttonal music, teleology, chromatic aggregates, sound masses, sets

The projection of goals and goal-oriented movement can seem to be a hopeless task for a composer of post-tonal orientation. The task of the composer is to find ways of activating the listener's memory and expectations despite the absence of a priori systems of organisation of pitches which might serve as guidance and which are offered by functional tonality.

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The analyst is faced with a problem of proving that even music which does not have a clearly articulated tonal progression directing its flow along the predicted path still moves meaningfully forward and its existence is not a mere series of sound occurrences in time. How can we recognize factors (conditioned by a context) which direct such music towards the goal and what are the criteria that define it? The objective of this work is the discovery and analysis of such teleological strategies, i.e. the ways in which music which is not tonal-oriented finds points of orientation, how it is structured around them and directed towards them as formal (and possibly narrative) supports.<sup>1</sup>

Goal-oriented music must, first of all, be conceptualized as movement, flow, process where events occurring throughout the work imply what follows. The direction of what follows should to some extent be predictable so that both local and global goals can be implied from such movement. Secondly, it is necessary to recognize the models of reinforcing tension and relief, whereby the release of tension and exhaustion of energy are characteristic of the final processes.

The modernist composition *Octandre* by Edgard Varèse, composed for seven wind instruments and double-bass, will serve as an analytical sample. An important element of the composition is the use of sound masses as basic building units. Although this term has not been clearly defined in literature, we will preliminarily define it as sound complexes composed of many elements (sounds) whereby it seems that the complexes cannot be dismembered but are regarded as a unique sound. The expressive meaning is within the general character of the sound, its colour, texture and dynamics, and not in the concrete melodic content: seemingly, the relevance of individual pitches is minimized. Such a profile of compositions points to the possible statics and absence of goal-oriented movement. However, the analysis has discovered the orientation towards certain goals, as well as the crucial importance of parameters of pitches during the process of their realisation.<sup>2</sup>

Varèse has constructed the sound mass through the verticalisation of the previous material – a class of pitches or intervals build a melody and then they are projected into a vertical sphere – and he has reorchestrated and set them up to make them sound together as an accord or the “sound mass”. It is cus-

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<sup>1</sup> Of course, I do not include here compositions where the absence of goal-oriented movement, “vertical temporality”, is an integral part of the composer’s idea.

<sup>2</sup> In relation to Varèse’s music, Chou Wen-Chung has tried to form a somewhat different definition of the sound mass and terms associated with it: “Sound-masses seem to emerge out of the expansion of an idea – “the basis of an internal structure” – into the sonic space.” The term of expansion here implies the process of verticalisation or register distribution of tones which are an integral part of that idea. They are an ideal of the liberation of sound and its free movement through space and, at the same time, they represent the goal of this movement and the essential generator of energy in the work. Chou Wen-Chung, “Open Rather Than Bounded”, *Perspectives of New Music*. Vol. 5, No. 1, 1966.

tomary that several tones form a basis for constructing the musical cell. Varèse himself spoke about the “idea” or “the basis of an internal structure, expanded and split into different shapes or groups of sound constantly changing in shape, direction, and speed...” – which is the basis drawn to and repelled by different forces, whereas he spoke about the form of the work as the consequence of all interactions.<sup>3</sup> One of the “ideas” of *Octandre*, which is at the beginning of the first movement, is limited to a series of four tones (G-flat-F-E-D-sharp). It does not act only as a musical idea of a solo oboe, but also as a generic factor of many motif and interval structures which become the framework of sound masses throughout the work. Linear processes in the work are directed towards projecting this idea through different dimensions – in this way it acquires the relevance of a structural element of the entire work and it paves the way to the processes which occur throughout all three extremely complex and strictly organized movements where almost every pitch has structural importance. One of the goals in such a processive linearity is the creation of interaction between different sound masses during their seemingly independent movement, whereby they clash, protrude and transform themselves into each other, which often results in the occurrence of new sound masses.

The most typical strategy of Edgard Varèse implies the creation of “ideas” focusing on one or several pitches which are often emphasized by repetitions, leaps or decorative notes which frame them. In a way similar to the motifs in the music of tonal tradition, these “ideas” represent a basis where a complex network of mutually dependant sound masses of the work has been created. In order to avoid potential confusion, the term “motif” (as well as “submotif” where necessary) will denote “ideas” which stand out as the most relevant ones. Besides, the term “motif” in this context should not be equated with the “traditional” view of the term, but it should be comprehended in a more abstract way, as an unarranged set of pitches which forms different horizontal and vertical configurations during the composition. When fulfilling the horizontal plane, and then distributing it into vertical dimension, “these piercing, aggressively travelling sounds move within the space created by a plangently dissonant harmony, spread out through the available instrumental registers. Its fundamental elements are a projection into the vertical sphere...”<sup>4</sup> Both melody and harmony<sup>5</sup> are essentially static here. The question of dynamics refers to orchestration – the quality and colour of every individual pitch is regarded as its essence.

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<sup>3</sup> Edgard Varèse: “Rhythm, form and content”, in: Barney Childs and Elliot Schwartz (Eds.), *Contemporary Composers on Contemporary Music*, New York, Holt Rinehart, 1967, 201–204, 203.

<sup>4</sup> Malcolm MacDonald, *Varèse, Astronomer in Sound*. London, Kahn & Averill, 2003, 142.

<sup>5</sup> It refers to the vertical (simultaneous) sound, and not to the “functional” harmony. Tonal heights do not have the tendency towards “harmonisation”, they represent independent sound identities.

While projecting these sounds into the vertical sphere, Varèse employs extremely distant instrument registers, using an entire available tonal scope. In this way, his music creates the effect of the “openness” he has always aspired to. Having been projected from initial ideas, the sounds fulfil the chromatic space and set up the moment of the fulfilment of the chromatic total as the goal. One of the most typical, almost manneristic means Varèse uses in these situations are successive layers of horizontal cell projections, which are subsequently verticalized in long rhythmic values that fulfil the entire register and increase the density of the texture and factual dynamics in order to make the final climactic accord with a crescendo effect.

When organising pitches, Varèse often uses chromatic aggregates which were defined by Miloš Zatkalik: “The term aggregate (...) denotes a segment which contains an unarranged twelve-tone set which, when completed, gives the effect of rounding up which is somewhat similar to tonic cadence in tonal music.”<sup>6</sup> The process of the completion of aggregates often implies postponement of the occurrence of the last tone, which intensifies tension. The reestablishment of imbalance and the sense of tension-release comes with the expected occurrence of the omitted tone. Bearing in mind the typology of musical goals proposed by Zatkalik,<sup>7</sup> the completion of aggregates can be considered an expected point of arrival towards which the previous flow was directed, which is analogous to the tonic in tonal music, but the major “credits” of this process lie in the proven ability of establishing balance after the imbalance caused by the previous flow of music. If the key definition of music as goal-oriented is: a) its ability to develop processes in which current events imply the following ones and which should, to a certain extent, have to be predictable so as to imply goals, b) the necessary recognition of the models of alternate tension and tension-release, the process of the completion of aggregates is considered to be one of the most important signals of goal-orientation in the music of post-tonal orientation.

In the case of *Octandre*, the relations of tension and tension-release are extended to more than one structural whole in two different ways. The first one implies postponement of the resolution (completion of the aggregate) until the occurrence of a new structural whole which will start by the pitch which was left out from the aggregate of the previous whole. The other way is the reverse of the first one and more specific – the aggregate of the new structural whole misses a pitch which had a prominent role within the previous whole, i.e. the new struc-

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<sup>6</sup> Miloš Zatkalik, “Twelve-Tone Aggregates in the Music of Edgard Varèse”, in: Miloš Zatkalik et al. (Eds.), *Proceedings of the Fifth International Conference on Music Theory and Analysis*, Belgrade, University of Arts, 2008, 138–161, 143.

<sup>7</sup> Miloš Zatkalik, “Reconsidering Teleological Aspects of Nontonal Music”, in: Denis Collins (Ed.), *Music Theory and its Methods: Structures, Challenges, Directions*, Frankfurt am Main, Peter Lang Publishers, 2013, 265–300, 269.

tural whole is “getting prepared” during the previous whole with the pitch that will prove to be the only one missing within it.

*Octandre* was written in 1923 for eight instruments – seven wind instruments and the double-bass and it consists of three movements of almost equal length.<sup>8</sup> The first two movements are divided into three parts, whereas the final movement is divided into four parts and some of them are split into sections (Example 1). The parts are mostly divided by a clear change of tempo and character which are followed by changes of the parameter of pitches in the first place, then the register, dynamics and articulation, which proves to be the most significant factor of the division of sections. The complexity of the work is reflected in the internal structures – sound masses – and almost each pitch within it has its structural significance. The work “is maintained” by a densely woven network of structural relations which are based on a relatively small number of basic structures. The most important source of ideas is the oboe solo at the beginning of the first movement, which provides important motifs and interval relations that are crucial for the construction of the majority of sound masses of the composition.

**The first movement**

The first part (1-18)

The second part (19-24)

The third part (24-32)

the 1.st section (1-9)    the 2.nd section (10-18)

**The second movement**

The first part (1-35)

The second part (36-66)

The third part (67-81)

the 1.st section (1-16)    the 2.nd section (17-35)

the 1.st section (36-49)    the 2.nd section (50-66)

**The third movement**

The first part (1-8)    The second part (9-23)    The third part (24-45)    The fourth part (46-60)

the 1.st section (24-39)    the 2.nd section (40-45)

**Example 1:** Edgard Varèse, *Octandre*, Structural plan

<sup>8</sup> The word *octandre* refers to a flower with eight stamens, but the title itself is not relevant for this composition (apart from the fact that it may refer to the number of instruments it was written for).

The motif of the solo oboe (in the further text: motif A) – a chromatic sequence of four tones (G-flat–F–E–D-sharp) [0123] represents the generator of one of the most important development processes in the work. Within this motif, there are two submotifs defined by a spatial proximity: G-flat–E–D-sharp [013] (submotif a) and temporal proximity: G-flat–F–E [012] (submotif b). In most of the composition they occur independently and the term “submotif” should not be taken for granted (as well as the term “motif”).<sup>9</sup> Together with intervals formed by the successive exposition of four tones in the introductory motif – minor ninth, major seventh and minor second as representatives of an interval class (in further text “IC”) 1, these submotifs will achieve a significant degree of independence throughout the work as one of the most frequent constituents of the sound masses. (Example 2)



**Example 2:** Edgard Varèse, *Octandre*, Initial motif in oboe – motif A [0123] with submotifs

Apart from this one, the oboe part provides one more most significant motif – B [016] which is formed by pitches E, D-sharp and A. The importance of this motif can be regarded in two different ways – first of all at the level of the first structure section, where it participates in the process of the completion of the first chromatic total, and then at the level of the entire composition where its importance in constituting a large number of sound masses is discovered. The first verticalisation of sets exposed in the oboe has been realized by the first simultaneous performance of the oboe and clarinet and later double-bass. Within this performance, we can first notice the verticalisation of intervals of major seventh, which will recur several times during the work as an independent sound mass and then in the performance of the three instruments, and the verticalisation of submotif b [012]. The process of the fulfilment of the first chromatic total is completed on the borderline between two sections by the occurrence of the missing tone G. The moment of its fulfilment in this case is of formal sig-

<sup>9</sup> Motif A [0123] can be regarded as the interaction of two submotifs b [012]. However, the distribution of pitches in the motif has given to the submotif a [013] the status of an independent entity within a superior set, which has been confirmed on several occasions in further work with sound masses.

nificance because it signifies the borderline between two sections – the moment of the completion matches the ending of the formal whole.<sup>10</sup> The borderline between two sections is overcome by the projection of submotif b which was formed by the completing tone of aggregate G and tones G-sharp and A as the most prominent pitches in the flute and trumpet parts. The rhythmically prominent motif B [025] in the flute, the clarinet and the trumpet, which is developed into a unique sound, will prove to be relevant in further work with the sound masses. The last three bars of the first part represent the first transformation of the sound masses at a distance. Namely, the sound masses exposed during the first fifteen bars of the composition now occur in a transformed form as reminiscences of their initial occurrences. The sound masses of the French horn and the bassoon (primarily in the form of major seventh – [01], bar 11) have now been transformed under the influence of the submotif a [013], whereas with the flute and the oboe which remind us of the figure of the bassoon and the trumpet from bar 13, they form motif A [0123], which, for the first time since the beginning, experiences its verticalisation. The new complex accord which denotes the ending of the first part, is formed by two submotifs b [012]. They are undoubtedly separated in terms of metrics and timbre which enables the determination of two contrasted sound masses that protrude into one another. This causes the transformation of the sound mass of woodwind instruments which is manifested in changes of the parameter of pitches, without influencing the structure of the accord. The second part (bars 19–24) consists of two contrasted sound masses allotted to woodwind and brass wind instruments and through which the importance of motif B [016] and intervals of the augmented fourth [IC 6] are directly or indirectly emphasized. The accord structure of the sound mass of brasswind instruments is formed by a combination of two motifs B in an intertwining relation, which results in the formation of a set [0167] – C, C-sharp, F-sharp, G. This is the first occurrence of the set [0167] in the function of forming an independent sound mass. The other, the sound mass of woodwind instruments ensues from the previous one and contrasts it in every aspect – first of all by the

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<sup>10</sup> Depending on the way the aggregate is positioned in the musical flow, its functions can be divided into the following categories, proposed by the same author (Miloš Zatkalik, “The Aggregate or Have the Notes Lost Orientation?”, *Muzikološki zbornik / Musicological Annual*, Vol. 44, No. 2, 2008, 69–86, 75): final or concluding; syntactic – where the moment of completing the aggregate matches the end of the syntactic unit; formal – where the moment of completing the aggregate simultaneously matches the end of the syntactic unit but also of a bigger formal whole; non-formal or non-concluding (transitory, connecting) – where the aggregate serves as a connection between neighbouring sections; dramatic or expressive – where aggregates participate in the articulation of the dynamic profile of music (most often creating and/or supporting the climax of the given composition); idiosyncratic – reflecting the personal attitude of the composer about the given procedure or phenomenon.

parameter of colour and then of pitches, rhythm and register. The French horn and the double-bass which participate in the formation of both sound masses, show a high level of flexibility which is primarily reflected in the adaptability of the parameters of the articulation and rhythm in the current sound mass. The mass consists of two submotifs b [012] which are at the distance of the augmented fourth (A-B-flat-B on the flute, oboe and clarinet and D-sharp-E-F on the bassoon, French horn and double-bass); thus they form the set [012678] and indirectly underline the importance of IC 6. The two sound masses interact in this way because the pitches which construct them form two chromatic sequences: from A to C-sharp and from D-sharp to G. The fulfilment of the chromatic total is obstructed by two pitches – D and G-sharp and they also indirectly emphasize the importance of IC 6. The transformation of the other sound mass (bar 22) has been realized in a way that, during their second occurrence, two elements of the sound mass of woodwind instruments from bar 20 (two chromatic sequences at a distance of an augmented fourth) were treated as independent entities in the function of forming two separate sound masses, which has provided the status of transmutation<sup>11</sup> for this transformation. Although they are very similar and within the same performing apparatus, they are juxtaposed so that they sound different, which has been achieved by the change of the relative position of each instrument within the accord. Simultaneously, on the French horn and the double-bass, which this time also participate in the second sound mass, the only two pitches which did not appear during the first occurrence of the sound mass are exposed – D and G-sharp, which finalizes the process of the completion of the chromatic total. In this way, the sense of tension, created by the inability to complete the total and additionally intensified by the disintegration of the sound mass of brasswind instruments as an important factor in the process of the completion, has been replaced by the sense of tension-release. The importance of the participation of these two instruments in both sound masses is suddenly evident. The flexibility demonstrated by participating in both sound masses has proven to be the deciding factor of their survival after the disintegration of the first sound mass. (Example 3)

The first transformation brought by the third part (bars 24–32) refers to the pedal interval – this time it is an augmented fourth of C–F-sharp between the clarinet and the trumpet. The importance of the relation between these pitches, apart from confirming the relevance of their interval class, will only be re-

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<sup>11</sup> According to Wen-Chung, transmutation is associated with a kind of variation or transformation which changes the attributes of sound masses. Transmutation also influences the surrounding context provoking the occurrence of new sound masses and/or their relocation. Chou Wen-Chung, *op. cit.*

vealed at the end of the movement. In bar 29, all the mentioned motifs dive into one accord which consists of two parts – the oboe and the remaining seven instruments. The pedal tone of the oboe remains independent from the rest of the accord and this independence is promptly noticed in its solo performance without the accompaniment. At that moment exactly, the relevance of the pitch C is revealed which is insinuated by the pedal augmented fourth because the initial idea of the oboe (from the tone G-flat), when repeated, becomes transposed for an interval of an augmented fourth. The entire repeated part, from bar 23 to the end of the movement, successfully leads the musical flow, through the recapitulation of the basic motifs of the work, back to the introductory motif and completing the movement in terms of its structure and idea.

— The first sound mass [0167]      — The second sound mass [012678]

**Example 3:** Edgard Varèse, *Octandre*, Sound masses of the second part, bars 19-21 (Lourd et sauvage)

The most important novelty brought by the second movement refers to the way new sound masses are formed whose structures are mostly derived from the structures of previously exposed masses. One of the four sound masses of the

second section (b. 17–35) consists of two accords which, although they do not have the same pitches, show a certain similarity – [014] and [015]. At a first glance, all accord structures are shown as new, independent entities, but with further examination of the structure of the work, their generic liaisons with the existing structures are clearly recognized. Together with the remaining three sound masses, it shows a high level of interaction which enables their grouping into two integrated sound masses. Although they represent four different identities in terms of the parameters of pitch, register, colour and dynamics, the ways their interactions are realized unify the first and the third sound masses, as well as the second and the fourth sound masses. The interaction of the sound masses which enables their grouping is primarily seen as complementing the first and the third sound masses through which solid associations with submotif b [012] are established. The fourth sound mass which represents the accord structure [014] identical to the primary form of the second accord of the second sound mass, follows the second sound mass throughout the entire section and together they make a more complex whole. (Example 4)

The interaction between two integrated sound masses is reflected in the existence of joint pitches (G-flat and F from the first mass appear as F-sharp and E-sharp within the fourth mass), as well as in the role-play which is most evident at the moment when the trombone withdraws from the pitch E, taken over by the French horn (from the second sound mass). In this relation between the masses, we can notice the penetration – the clashing of the sound masses and protrusion of one into the other during which one sound mass adopts the characteristics of the other one. The withdrawal of the third sound mass implies the disintegration of the first sound mass which will occur somewhat later (in bar 30). Thus, the French horn is the stability factor (pitch E) until both sound masses withdraw simultaneously. The return of the pitch E in the trombone implies the beginning of a new part of the movement marked by the first metric change since the beginning of the movement.<sup>12</sup> The fulfilment of the chromatic total of the second movement is disrupted by pitch C, and knowing its structural importance at the end of the first movement, it is no surprise that Varèse applies it, in the manner of mannerism, to prevent the fulfilment of the goal with it by completing the aggregates.

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<sup>12</sup> We should mention the general rest in bar 32. Since its occurrence does not match the structure borderline, but it suddenly interrupts the flow of the section, the reason for its occurrence at the given moment should be found somewhere else. If we take into consideration the full number of bars (173) and the bar where the general rest occurs, we come to the proportion which approximately corresponds to the proportion of the golden section. The real golden section of the composition is in bar 36 which signifies the beginning of the second part of the movement.

a)

■ Sound mass 1   
 ■ Sound mass 2   
 ■ Sound mass 3   
 ■ Sound mass 4

b)

piccolo - clarinet    bassoon - horn - bass    trombone    oboe - clarinet - trumpet

1) [015]    2) [014]    3) [012]    4) [014]

c) Interaction between the first and the third sound masses

Complementing the first and the third sound masses (piccolo flute, clarinet and trombone)

**Example 4:** Edgard Varèse, *Octandre*, Sound masses of the second section, bars 17-35

A somewhat different form of also complicated relations between the sound masses is recognized in the next part of the movement (b. 36–66) divided into two sections. The first sound mass (on the bassoon and double-bass) in the form of pedal ninth of F–F-sharp follows the sound mass of the trombone (pitch E) which has been present since the previous part, thus forming submotif b [012]. This sound mass is contrasted by the mass of oboe, clarinet, French horn and trumpet, whose accord structure [0135] creates associations with submotif a [013] and the first accord of the second sound mass of the second section [015].<sup>13</sup> The varied motif within the sound mass of the trombone is a transformed motif of the piccolo flute from the beginning of the movement and it represents the synthesis of submotif b and motif B – [0126].

The second section of the second part (b. 50–66) is fulfilled by two sound masses whose pitches are complementary, with a common subset (F, F-sharp and G – [012]), which fulfil the chromatic total by their first performance, which is the first case in the work. The accord structure of the first sound mass – [0123459] is the synthesis of motif A [0123] and set [0126], whereas the second sound mass represents the synthesis of all sets exposed since the beginning of the work and it represents the most complex structure [012345789], closest to the independent fulfilment of the total. We will see later that the formation of this set is very important for proving the orientation of the musical flow of the work. The third part of the movement (b. 67–81) consists of two sound masses, on the oboe and clarinet – [0127] and on the bassoon, French horn, trumpet, trombone and double-bass – [012358]. The sound masses develop independently until the end of the movement, fulfilling the chromatic space of ten pitches. The pitches left out in the performance of the sound masses occur first in the section of the piccolo flute which exposes the submotif b [012]. The pitch used by the piccolo flute to finalize the second movement – F-sharp, is an enharmonic equivalent to the tone G-flat and it clearly refers to the solo from the beginning of the movement, and the connection between the two elements is additionally emphasized by the same ornaments.

The third movement is the recapitulation of the material of the first two movements and it is reminiscent of the most important sound masses of the work. The four parts of the movement are clearly separated by the changes in tempo which also follow the occurrences of new sound masses. The final movement shows another of Varèse's approach to the sound mass as a basic building unit, by evoking the traditional formal model. The first eight bars of the introductory part are freely imitated by the bassoon and double-bass which expose

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<sup>13</sup> At the same time, the set [0135] is an inverted set [0245] which means we can recognize the influence of motif B [025] in this accord structure.

ten pitches of the chromatic scale, leaving out F-sharp and G-sharp. The “official” recapitulation (in bar 7) will lead to the fulfilment of the chromatic total owing to the occurrence of the omitted pitches on the bassoon and trombone. The process announced by the introductory part is fully realized in the second part where the theme of the oboe becomes the basis of fugato. The main characteristic of this part is the gradual transformation of the theme through imitation, within which we can notice Varèse’s approach to the theme of the fugue as a sound mass. The principle of imitation influences the timbre characteristic of the sound mass which, when subjected to it, undergoes a transmutation. During the imitative exposure of the sound mass, countersubjects sounding simultaneously with it have been created on the materials exposed in the first movement. After the third performance of the theme on the clarinet, the chromatic total is fulfilled and the sound mass is dissipated in the effort of the double-bass to expose certain elements of the theme for the last time (mostly certain rhythmic models). The moment of the fulfilment of the chromatic total matches the disintegration of the sound mass which does not manage to regain the status it had, thus initiating the occurrence the new sound mass on the flute, French horn and trumpet – [014]. The bassoon, which had the role of a countersubject at the end of the fugue part, is now being transformed into the new sound mass, together with the double-bass, and later the trombone – [016], which will oppose the first sound mass. The third part (b. 24–25) is divided into two sections comprised of three sound masses, all of them representing reminiscences of those exposed in the first two movements.

Therefore, it can be concluded that the structure of the entire work is based on a relatively small number of basic motifs presented in the first movement, and distributed throughout the work in a way that they become the building tissue of a densely woven network of mutual relations, with the aim of forming sound masses as basic building units. The deepest level of the structure consists of three motifs:

1. A [0123] with its two submotifs: a [013] and b [012], determined by spatial and temporal proximity
2. B [016]
3. C [025]

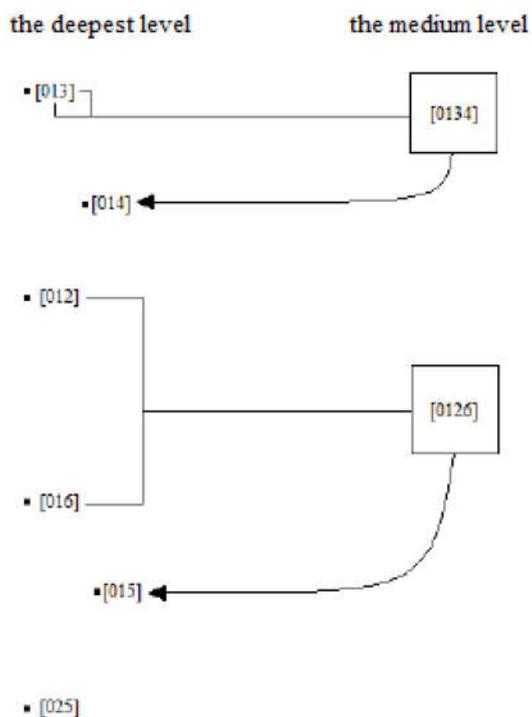
The basic motifs (motif A with its submotifs) interact differently throughout the work, thus creating new combinations of sets as the structural framework of the sound masses. There are two ways of integration within which new sound masses develop:

1. By combining two identical sets, i.e. motifs or submotifs, in the following way:

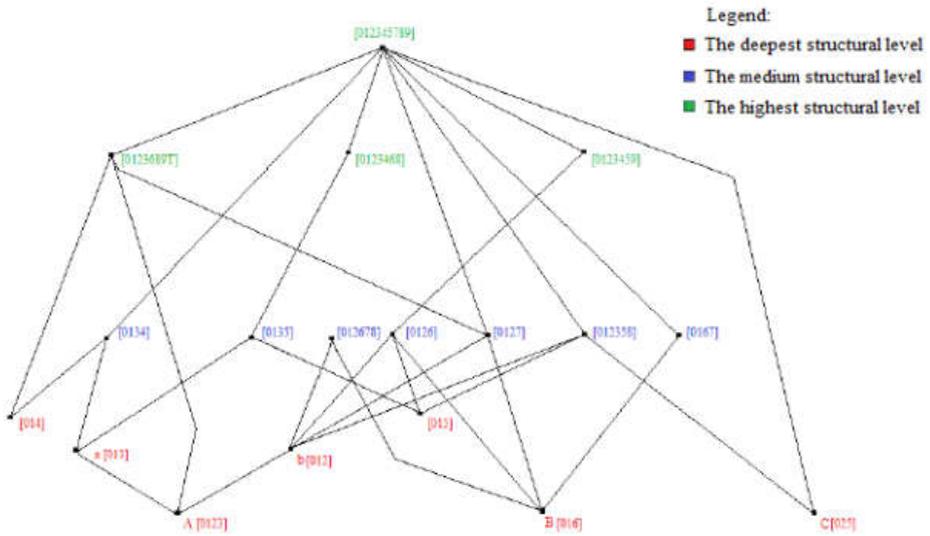
- a) they interact – when two sets (two groups of pitches) are set up in a way that they have a common subset, e.g. interaction of two submotifs a – [013], which results in the creation of the set [0134];
  - b) at a distance – when two groups of pitches stand at a certain distance, e.g. two submotifs b – [012], which form the set [012678].
2. By combining two or more different sets, i.e. motifs and submotifs, in all potential combinations:
- a) two or more motifs, e.g. motif A [0123], motif B [016] and motif C [025], which results in the creation of a set [012345789];
  - b) one motif and one submotif, e.g. motif B [016] and submotif b [012], which results in the creation of the set [0126] or [01278] or motif B [025] and submotif b [012], which forms the set [012358];
  - c) combining one of three basic motifs with one or more newly-established sets, which also leads to the formation of new sets, e.g. combining motif A [0123] with the previously mentioned set [0126], which leads to the creation of the set [0123459].

The listed sets illustrate one part of the new sets which were created during complex interactions recognized throughout the work. Their relations can be followed at three structural levels. The deepest level of the structure occurs in two forms – direct and indirect. The direct form consists of the basic motifs of the work: A, B and C. The analysis has revealed two more sets – [014] and [015], which directly become a part of the deepest level. Their directness can be noticed only after the analysis of the medium structural level which is made up of interactions of the sets of the deepest level. These sets are not motifs, which is the case with the three mentioned motifs of the deepest level, but throughout the work, especially in the process of the creation of new sound masses, they demonstrate an independence characteristic of basic motifs, which is primarily reflected in the ways they interact, which categorizes them at the deepest level of the structure. These are the sets from the second section of the second movement and the indirectness of their occurrence is reflected in the fact that they are derived from the sets of the medium level (sets created through the interaction of the sets of the deepest level) and a retrograde tendency which makes them a part of the deepest structure. Namely, the set [014] is the subset of the set [0134] which was created by the synthesis of two submotifs a [013], whereas the set [015] is the subset of the set [0126] which was created by the synthesis of submotif b [012] and motif B [016]. Although chronologically they occur after the sets they were derived from, which classifies them as their subsets, the independence they demonstrate throughout the work and which is reflected in their rela-

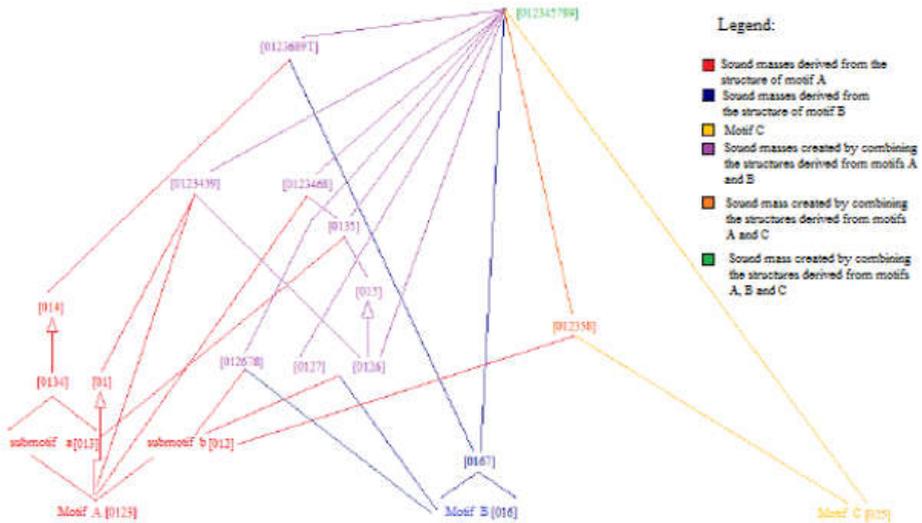
tions with the sets of the deepest and medium structural levels allows them to be classified as the sets of the deepest structural level (Graph 1). At the same time, with submotifs a [013] and b [012] and motif B [016], these two sets participate in the realisation of another completing process – the exhaustion of the set of all trichords containing IC 1. While the medium level of the structure represents the first level of interactions of the sets, the highest level of the structure occurs by synthesis of the sets of the medium structural level. In this way, the structure of the entire work, created by the “elaboration” of a small number of basic structures (sets) proves the orientation of the musical flow. It is not perceived by the mere process of listening – it becomes obvious only after the analysis of the deep structures of the composition. (Graph 2)



**Graph 1:** Edgard Varèse, *Octandre*, Sets [014] and [015] in the structure of the deepest level



**Graph 2:** Survey of prolonged structures (sound masses)



**Graph 3:** Illustration of sound masses

The interactions of the sound masses are reflected in their intertwining, entanglement and the influences they have on each other in their common action with the aim of achieving the chromatic total. The most frequent form of interaction of the sound masses occurring in *Octandre* and defined by Chou Wen-Chung as penetration, refers to the collision, i.e. register and/or temporal clash of the sound masses where we can notice the tendency of one mass to protrude into the other mass and during which certain characteristics of one sound mass become characteristics of the other sound mass. This is visible both in the successive series of sound masses and in their relations at a distance (primarily in the final movement). The other occurrence, which refers to the type of transformation that changes the characteristics of the sound masses, is called transmutation. The fact that neither author in their definition mentions an interaction of sound masses but transformation as such, one that implies modification of the attributes of the sound mass, leaves plenty of room for different interpretations of this phenomenon. On the one hand, transmutation does not necessarily need to be the result of the influence of the other sound mass – it can be associated with any form of transformation. On the other hand, and bearing in mind the definition of collision and penetration, we can conclude that transmutation is an inevitable consequence of all collisions of sound masses and the penetration which is followed by the modification of the character of at least one sound mass. It can be further concluded that any kind of change which does not alter the character of the sound mass remains at the level of variation or transformation. All aforementioned phenomena related to the sound masses have proven to be an indispensable condition for the fulfilment of the chromatic total throughout the work. This goal is always realized by the interaction of two or more sound masses. The mildest form of interaction brought by the chromatic total has been mentioned in relation to the sound masses of the second section of the second part where two masses – [0123459] and [012345789] by their first occurrence already complete the chromatic scale. In all the other aforementioned examples, the condition which proved to be necessary for the fulfilment of this goal was the complex interactions of the sound masses. Prolonging the deep structures, which have previously been mentioned, has proven the paradigmatic orientation of the flow as a generative aspect where out of the elementary units more complex structures are derived – sound masses as the goal of the process. It has already been said that the most complex sound mass [012345789] is crucial for understanding the teleological strategies of the work. It is set as the goal of the paradigmatic axis since it has been derived from the structures of the three basic motifs. The fulfilment of the chromatic total, as the other type of goals Varèse's music aspires to, represents a syntagmatic form of its orientation and, through the described interactions of the sound masses, it undoubtedly points to the fact

that the music of *Octandre* is goal-oriented. In this way, the orientation of the musical flow in *Octandre* can be noticed only by the simultaneous monitoring of the syntagmatic and paradigmatic planes, their mutual dependence and the relations established between them (Graph 3). The orientation of the musical flow and the prolongation of the deep structures can be associated with the linear elaboration and the direction of movement “from left to right”, from the beginning towards the ending of the composition. The existence of the deep structures and their elaboration with the aim of creating more complex structures – sound masses, testifies of the existence of prolongation processes which move “into the depth”. By establishing different interactions, the sound masses as the result of the prolonged deep structures get most of the credit for the sense of orientation of the musical flow. They contribute to the linear orientation of the musical flow which is most clearly recognized through the processes oriented towards the fulfilment of the chromatic total. In this way, the linear elaboration which works in the syntagmatic plane, is achieved indirectly, through processes achieved in the paradigmatic plane. We have a feeling that Varèse uses the metaphor to address us in order to communicate one more time that his music is the music of “intelligent sounds moving in space”, that it fulfils the space and makes it “open rather than bounded”.<sup>14</sup> The composer subtly directs the processes moving in different directions and thus realizes his idea and projects his music through an “open space” and all “available dimensions”. It has been confirmed in the analysed composition that there is a stable system which forms the basis of all the described processes taking place on the “surface”. This system lies on the balanced relation of “forces” between the factors which violate stability and those which achieve stability and it testifies about the existence of the previous dramaturgical conceptualisation and teleological strategies of the work.

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## Summary

The projection of goals and goal-oriented movement can seem to be a hopeless task for a composer of post-tonal orientation. The task of the composer is to find ways of activating the listener's memory and expectations despite the absence of a priori systems of organisation of pitches which might serve as guidance and which are offered by functional tonality.

The analyst is, on the other hand, faced with the problem of finding and proving that even music which does not have a clearly articulated tonal progression directing its flow along the predicted path still moves meaningfully forward and its existence is not a mere series of sound occurrences in time. How can we recognize factors (conditioned by a context) which direct such music towards the goal and what are the criteria that define it? The objective of this work is the discovery and analysis of such teleological strategies, i.e. the ways in which music which is not tonal-oriented finds points of orientation, how it is structured around them and directed towards them as towards formal support.

The modernist composition *Octandre* by Edgar Varèse which is composed for seven wind instruments and double-bass served as an analytical sample. An important element of the composition is the use of sound masses as basic building units. Although this term has not been clearly defined in literature, we preliminarily defined it as sound complexes composed of many elements (sounds) whereby it seems that the complexes cannot be dismembered but are regarded as a unique sound. The expressive meaning is within the general character of the sound, its colour, texture and dynamics, and not in the concrete melodic content: seemingly, the relevance of individual pitches is minimized. Such a profile of composition points to the possible statics and absence of goal-oriented movement. However, the analysis has discovered an orientation towards certain goals, as well as the crucial importance of the parameters of pitches during the process of their realisation.

When organising pitches, Varèse often uses chromatic aggregates which were defined by Miloš Zatkalik: “The term aggregate (...) denotes a segment which contains an unarranged twelve-tone set which, when completed, gives the effect of rounding up which is somewhat similar to tonic cadence in tonal music.”<sup>15</sup> The process of the completion of aggregates often implies the postponement of the occurrence of the last tone, which intensifies tension. The reestablishment of imbalance and the sense of tension-release comes with the expected occurrence of the omitted tone.

By analyzing ways in which the processes of aggregate completion are carried out, by studying sets that build sound masses and by identifying threads of the dense woven network of relationships into which the sound masses enter during composition, the existence of teleological strategies that influence the direction of the music flow of the selected work has been revealed.

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<sup>15</sup> Miloš Zatkalik, “Twelve-Tone Aggregates in the Music of Edgard Varèse”, *op. cit.*, 143.