

## Acoustic Instruments as Primitive Sources of Sound Synthesis in the Orchestral Writing of Edgard Varèse – *Arcana* and *Amériques*

**Abstract.** Research on the works of Edgard Varèse to date seems to characterise the composer as an early modernist and scientific pioneer who, through his ingenious compositional approach, managed to foresee the future evolution of various aspects of the musical thinking in the middle and late 20th century. The composer's innovative ideas on manipulating the sound of orchestral instruments as a natural phenomenon unfolded in the dimension of time seem to be particularly evident in Varèse's existing works, the majority of which are written for chamber ensembles.

The absence of high-tech quality electronic music media, as these were in a rather primary stage of development at the time, seems to have urged Varèse to utilise various innovative compositional methods, unforeseen to his contemporaries, which he applied to the existing orchestral instruments, achieving his unique compositional language. Thus, elements of what seems like an early form of additive synthesis or frequency filtering, or examples of noise incorporation and manipulation, are evident throughout his musical structures, as a means to shape his compositional identity.

In this paper, extracts from representative masterpieces are presented, in order to examine various aspects of Varèse's writing. Starting from a solo context, relevant examples from *Density 21.5* will be presented, while further aspects from *Amériques* (1918–21) and *Arcana* (1925–27) will be discussed, in an attempt to expand the context of chamber and orchestral music. The main objective is to explore specific practices applied on traditional orchestral instruments, which led to the emergence of innovative ways of compositional thinking in his era, thus setting the path of acoustic electronic and electro-acoustic writing, while influencing the orchestral writing of future generations of composers.

**Keywords:** Edgard Varèse, Contemporary Orchestral Music, *Arcana*, *Amériques*, Acoustic Synthesis.

### 1. Introduction: Aspects of innovation in Varèse's Music

November 6th 2019, marked fifty-four years since Edgard Varèse passed away and it seems that the composer's overall approach to sound still stands fresh, inspiring compositional styles, methodologies and languages of our present in various ways, some of which will subsequently be discussed through this paper. In other words, Varèse's compositional perspective could still be perceived as "contemporary". To begin with, it is worth making a reference to the widely-known Futurist Manifesto by Luigi Russolo, in 1913. In the beginning, Russolo mentions that noise started being incorporated in art as industry developed, which, unavoidably, had an impact on the every-day life. This fact has brought new, previously unheard sounds to the public's ears while, at the same time, making the need for further exploration of sound more pertinent (Lanza 2004: 60). The beginning of the manifest should be linked with the first conclusion, where Russolo (2004: 11) discusses possible enrichments of contemporary, to the 1910's–20's, musical sound:

"We must enlarge and enrich more and more the domain of musical sounds. Our sensibility requires it. In fact it can be noticed that all contemporary composers of genius tend to stress the most complex dissonances. Moving away of pure sound, they nearly reach noise-sound. This need and this tendency can be totally realized only through the joining and substituting of noises to and for musical sounds."

Despite the fact that Russolo's futuristic perspective appears to draw a revolutionary red line between the old and the new, the artistic result of the noise machines seems to have been characterised as partly amateurish. More specifically, Helga de la Motte-Haber (2000), in her paper "Sound Sampling: An aesthetic challenge", presents a reflective thought of Varèse, where the composer complains about the futurists' use of every-day noise in their works, as he considers the specific sound material as "compatible with the traditional concept of art" (2000: 200).

Many researchers might agree that this specific perception of sound influenced and affected the language of many composers, like Stravinsky and Varèse himself, who belonged outside the futuristic movement (De la Motte-Haber 2000: 200). From a personal perspective, as a composer, there have been many times in my career when I have reflected upon elements of my personal writing which might have their origins in the aesthetic direction of that era; further to this, reflecting more widely, considering the impact of this era on the overall broadening of compositional horizons, one might argue that it has influenced emerging generations of composers, as the previous, tonal, tempered system did for centuries.

For the first half of the twentieth century, various composers, including Varèse, Cage and others, focused on extending the conventional sound material, incorporating noise into their compositional vocabulary. In contrast to the futurists, these composers seem to have infinitively attempted to achieve the perfect balance

between traditional sound and noise. In addition, the role of the early electronic media was explored and should be acknowledged as substantial. The gradual and continuous development of the studio provided composers with the opportunity to think beyond the established ways, by experimenting with the extension of the timbral potential of acoustic instruments, or by utilising new ways of orchestration. This process often resulted in the generation of previously unheard sonorities, inspired by fundamental electronic music techniques, such as additive synthesis, noise filtering and others.

Edgard Varèse, attempting to identify his own tools to fulfill his compositional needs in relation to his musical ideas, aesthetics and preferred means of expression, seems to be one of the first composers who focused on the nature of music, through the exploration of parameters related to sound as a natural phenomenon. Hence, in the majority of the composer's saved works, there seems to be a great "synergy" between art and science (Risset 2004: 27). Recalling his interaction with Varèse at the Bell Laboratories, Jean-Claude Risset claims:

"Varèse coined the expression 'organised sound'; he pioneered the expression of compositional activity to the elaboration of sound – composing the sounds themselves, rather than merely composing with sounds" (Risset 2004: 27).

In order to serve his – contemporary to his era – compositional thought, Varèse manipulated his instrumental and orchestral writing in a way that his sounds and structures were "alive" and "vibrating" catering to the new needs for expression, as created during the first decades of the twentieth century (Risset 2004: 31).

Thus, Varèse's saved works seem to include an infinite and foreseeing artistic research on ways that traditional instruments could be utilised to serve as the primarily developed electronic media of the unknown, to the era, future. In particular, almost every instrument of the orchestra, or of his ensembles, is used as a sound unit, which generates the primary sonic material, to be elaborated and shaped into innovative musical structures. This view towards the potential of acoustic instruments seems to be reflected within Varèse's perspective of instrumentation, as identified in a variety of contexts, including solo, chamber and orchestral ensembles.

## 2. Aspects of musical spacing in *Density 21.5*

Starting from a solo instrument level, several relevant observations could be made in relation to the composer's only solo work, *Density 21.5* for Flute (1936). In this particular work, Varèse seems to demonstrate a clear view of musical spacing, also found in the majority of his chamber and orchestral compositions. One year later, in 1937, Varèse gave a seminar on contemporary music at the Bennington Summer School of Dance. However, instead of analysing aspects and issues of contemporary composition, he spent most of the time discussing spacing in Beethoven's Symphonies and on the use of instrumental timbre by Berlioz, as a vital part of his musical forms (Luening 2004). In *Density 21.5*, composed for Georges Barrier's platinum flute, Varèse appears to utilise the instrument as a "lever" in order to broaden or narrow the musical space. The figure below illustrates the manipulation of musical spacing, as found in the opening of the work:

Figure 1. *Density 21.5* – Manipulation of musical space (bars 1–4)

At the first phrase, bars 1–4, a semitone ( $F_4-E_4$ ) becomes a tone ( $E_4-F\sharp_4$ ), then a perfect fourth ( $C\sharp_4-F\sharp_4$ ), and a diminished fifth ( $C\sharp_4-G_4$ ). After a short melodic elaboration, the musical space appears to be extended to a diminished seventh ( $C\sharp_4-B\flat_4$ ), and then narrowed to a minor third ( $G_4-B\flat_4$ ) and back to a tone ( $B\flat_4-C_5$ ), to conclude to a semitone again ( $D\flat_5-C_5$ ), where the next phrase begins. This process could raise the following questions, regarding aspects of perception: would the content of *Density 21.5* be perceived as monophonic, or partly polyphonic, development of the primary music material, along similar lines of one of Telemann’s Flute fantasias, for example, or, could these melodic points, defined by the audible pitches, be interpreted as indications of fluctuating ranges within the musical space? In other words, does the listener merely perceive a sense of melodic development, or a more active impression of broadening and narrowing of musical space, created by the alternating pitch indications? Both of the above interpretative approaches could potentially be viewed as equally valuable and possible, also signifying Varèse’s fresh perspective towards fundamental elements of the past, such as, in this case, aspects of melody.

### 3. Examining the role of Percussion instruments

In our contemporary era, it has been viewed as a historical fact that the twentieth century was the period when percussion instruments were liberated and perceived as an equally significant and diverse section of the orchestra, to that of strings and wind instruments. In the introduction of the twelfth chapter “The percussion ensemble”, Samuel Adler in his classic “The Study of Orchestration” (Adler 2002: 432), mentions that, despite the fact that percussive instruments have been in use since the dawn of humanity, their expressive potential became exploitable at the past century. More specifically, he states that:

“The percussion ensemble did not reach its full potential until the twentieth century, when it not only grew immensely in the number of instruments used but also became an orchestral ensemble in and of itself, particularly in works such as Edgard Varèse’s *Ionisation* or George Antheil’s *Ballet Mècanique*.”

Adler also refers to works by George Crumb, with regard to influences of eastern cultures on western music. Nevertheless, the case of Varèse appears to be significantly different from his contemporary avant-garde Americans, in terms of the role of percussion instruments in his works: he often seems to utilise these as sources for producing pure sound material, or as tools to alternate and filter the original timbre of the orchestral instruments. Listing Varèse’s saved works in chronological order, it can be noticed that, as shown in Figure 2, eight out of fifteen compositions employ large percussion sections, from four to thirteen performers:

Year	Work Title	Percussion Setup
1918-21 (rev. 1927)	<b>Amériques</b>	9 Players +2 Timpani sets
1921	<b>Offrandes</b>	6 Players
1922-23	<b>Hyperprism</b>	7 Players
1923-25	<b>Intégrales</b>	4 Players
1925-27	<b>Arcana</b>	6 Players +1 Timpani set
1929-31	<b>Ionisation</b>	13 Players (Percussion only)
1932-34	<b>Equatorial</b>	6 Players
1950-54	<b>Déserts</b>	5 Players + Tape

Figure 2. Use of the percussion in Varèse’s saved works

Many of the percussive ideas found in Varèse’s compositional language seem to function as independent sonorities, which are often not limited to functioning as means for doubling the pitched instruments anymore, but often carry the full musical burden (Morgan 1991). Hence, the primary sound material, which is based on

pitch to a lesser extent, appears to be more independent, offering at the same time new opportunities for the composer to shape innovative, for his era, sonorities and structures. *Ionisation*, composed during 1929–1931, appears to be the composer’s peak in relation to organising pitch sonorities. It is worth mentioning that in addition to the non-pitched percussion instruments, at the thirteenth section of the work (marked by the composer, bars 75–91), Varèse’s scoring includes the Tubular Chimes, the Celesta and the Piano for players 10, 11 and 13 respectively. Despite the fact that Tubular Chimes, Celesta and the upper part of the piano (staves 1 and 2) include clearly notated chords, the harmony implied during the specific passage seems to have been shaped in an alternative way. More specifically, Varèse appears to use a noise reservoir, which consists of a large chord at the bottom staff of the piano part in *fortissimo* dynamic, combined with the Tam-tams and Gong (players 1 and 2 respectively), in *forte* dynamic. The above instrumentation results in a dense sonority, which includes a vast number of harmonics. Specific partials of this particular harmonic surface seem to be amplified by the Tubular Chimes and the Celesta, also in *forte* dynamic, instruments which seem to be used as a filter to the above, clusteroid fundamental idea. In addition, granular sonic events are added by the rest of the percussion ensemble, while the two sirens included at the fifth and sixth Percussion players, lead the overall level of tension of the final section of *Ionisation* to its peak. Figure 3 demonstrates bars 75–81, clarifying the distinct layers of sound units, forming the epilogue of *Ionisation*:

The figure shows a musical score for 13 percussion players. The instruments listed are: 1. Tam-tam clair, 2. Gong, 3. Bongos, Caisse Rouillante, 4. Tambour militaire, 5. Sirene claire, 6. Sirene grave, Fouet, Gũiro, 7. Blocs Chinois, Claves, Triangle, 8. Caisse claire, 9. Tarole, 10. Cloches, 11. Glockenspiel à clavier, 12. Grand Tam-tam, 13. Piano. The score includes various dynamics and performance instructions. To the right of the score is a diagram illustrating the layers of sound units. The layers, from top to bottom, are: Noise amplifiers (black box), Granular sonorities (white box), Granular sonorities (white box), Partials Filtered (white box), Noise amplifier (black box), Partials Filtered (white box), and Noise reservoir (black box). Arrows indicate the flow of sound units between these layers. Below the diagram is a small musical notation showing a bass clef with notes on the staff, labeled '8<sup>va</sup>-----1'.

Figure 3. Sound units in different layers of *Ionisation* (bars 75–81)

Discussing percussive elements in Varèse's writing, it also seems necessary to refer back to a specific passage of *Density 21.5*, linking an additional example of relevant thinking. In particular, in bars 24–28 of *Density 21.5*, Varèse appears to extend the conventional sound of the Flute, through alternating its attack, by combining it with the percussive timbre of key-clicks. Considering that the attack is one of the most significant parameters in terms of discriminating instrumental timbre (Dodge & Jerse 1997: 51), through this practice Varèse produces an innovative to the era, processed flute sound, which is characterised by reduced sustain achieved by *staccati*, and an alternated attack achieved by combining the ordinary sound with key-clicks. The specific percussive part of *Density 21.5* is shown in the following figure:



Figure 4. Key-clicks passage in *Density 21.5* (bars 24–28)

#### 4. Aspects of Varèse's Orchestral scoring in *Arcana* and *Amériques*

Samuel Adler describes the orchestra as “one of the noblest creations of Western civilization” (Adler 2002: 3). A group of different timbres which, unified, constitute a large, complicated instrument, which gives special personalities to composers, from the seventeenth century to nowadays. During the first decades of the twentieth century, composers' desire to explore new sounds had a great impact on orchestral writing as well. Regarding the case of Varèse, the orchestra seems to substitute the studio – not yet developed to our contemporary extent. Independent instruments and instrumental groups of the orchestra seem to have been used as sound generators leading to new sound qualities and effects, the elements of which can interact with each other and, often, produce sonorities which are very close to the ones extracted from studio processes, such as through additive synthesis, noise generators and various methods of spectral filtering. Examining Edgard Varèse's biography and list of works, the composer's interest in scoring for orchestra is prominent. Sixteen out of thirty-eight of Varèse's works are written for orchestra, plus another four works for Choir and Orchestra, with, unfortunately, only two saved as complete, *Amériques* and *Arcana*. At this point, it should be clarified that choral works, along with relevant techniques and compositional practices are not discussed within this paper, since the present focus lies primarily on the composer's instrumental sound world.

*Amériques*, composed in 1927 and revised two years later, is Varèse's earliest saved orchestral work. Before that, Varèse seems to have composed thirteen more orchestral works which have been unknown to us; had these been saved, they might have shed more light on the course of development of the composer's artistic thinking. Fernand Ouellette dedicates a whole chapter in his book “Edgard Varèse”, where the author presents *Amériques* as Varèse's “first great work, one that he was to recognize as being truly an expression of his universe” (Ouellette 1973: 55). It is worth mentioning that in *Amériques*, Varèse utilises the largest Percussion section: nine players plus two sets of Timpani. Through such an extensive use of percussion instruments in the orchestration, the composer seems to initially generate two distinct types or sonorities, the Orchestral and the Percussive. As Ouellette also mentions (1973: 57):

“Percussion is not (used) to provide rhythmic punctuation or to accelerate certain cadences, but to penetrate into the masses of instrumental sound, to lend them special and varied vibrations.”

In the very beginning of the work, the Alto Flute melody appears to have been put in front of a granular canvas, generated by the two harps, which perform a repeated pattern. As this material is being developed, reaching its peak at the eighth bar of the work, the timbre and density of the initial granular background is enriched with the whole percussion section of the orchestra, which makes this particular texture denser, through the various rhythmical irregularities occurring by the Harps and the Percussion. Figure 5 illustrates two representative extracts from an optimised version of the full score of *Amériques* (bars 1–3 and bars 9–10):

Bars 1-3

rall. a tempo

Alto Flute (in G)

3 Bassoons

Harp 1

Harp 2

incisif *p*

Granular enrichment of the thematic idea by the Harps

Bars 8-10

1 Animato molto subito ( $\text{♩} = 112$ ) Subito a tempo I ( $\text{♩} = 60$ )

G A. Fl.

Harp 1

Harp 2

S.B.  
S.D.

Cym.  
B.D. 1-2

Tri.  
Cast.

Tamb.  
W.

1 Mattfuchs  
2 Bal. Metall.

sempre *pp*

Granular enrichment of the thematic idea by the Harps & Percussion

Figure 5. *Amériques* opening part (bars 1–3 and 9–10)

In addition to the example above, it is also worth reflecting on Varèse's harmonic approach. Although chordal progressions do often exist in the composer's language, harmony does not seem to function in the traditional way within the music itself. American composer Henry Cowell, commenting on Varèse's harmonic language, underlines the fact that the composer's harmonic approach seems to be quite far from his era. Varèse appears to be particularly interested in experimenting persistently and in detail with different ways of achieving a desirable sound quality, aiming to find a specific note that will sound a certain way on a certain instrument, with its certain position into the orchestral fabric.

The following figure illustrates an extract from *Amériques* (bars 76–83), where the superimposition of pitches can be noticed, creating a typical, "Varèsian" harmonic surface by the Brass and the Woodwind instruments. It is worth mentioning that the lower partials are in low dynamics (*pianissimo*), while the higher ones are placed in a higher dynamics environment (*fortississimo*). This formation could be perceived as a

synthesised spectrum, which appears to be non harmonic according to the intervallic ratios, with reverse loudness levels between the higher and the lower partials. Thus, sound seems to be re-synthesised, by alternating fundamental parameters of a common sound spectrum, such as the loudness of its partials.

The image shows a page of a musical score for 'Amériques', specifically bars 76-83. The score is arranged in a standard orchestral format with multiple staves for different instruments. The instruments listed on the left are Percussion (Perc.), Flute (Fl.), Oboe (Heck.), Clarinet in B-flat (Eb Cl.), Clarinet in B-flat (Bb Cl.), Bassoon (Bass.), Contrabassoon (C. Bass.), French Horns (F Hrns.), Trumpet (C Tpt.), Trombone (Trbn.), Tuba, and C. Tuba. The score includes various musical notations such as notes, rests, and dynamic markings (ff, f, p). There are also performance instructions like '1. ouvert' and 'bouché'. On the right side of the score, there are two callout boxes. The top one is black with white text and says 'Higher Partial in High Dynamics (ff)'. The bottom one is white with black text and says 'Lower Partial in Low Dynamics (pp)'. The score shows a complex texture with many overlapping notes and dynamics, illustrating the 'superimposition of pitches' mentioned in the caption.

Figure 6. *Amériques*, superimposition of pitches (bars 76–83)

Extending Fernando Ouellette’s statement on the role of Percussion in Varèse’s compositional language, as discussed above, it is worth also focusing on the twelfth section of *Amériques* – as marked by the composer. This particular section could be perceived as a representative passage, where percussive ideas function as additional parameters/effects to an initial block of sounds. Figure 7 illustrates the first bars of Section 12, where the two Harps and Percussion are combined together, performing steady rhythmical patterns, which consist of 5, 3, 4, 6, 6 and 4 pulses over a static harmonic surface, generated by the strings. Here, Percussion instruments, both pitched and unpitched, in combination with the harps, seem to work as a kind of *vibrato* generator for the strings. It should be highlighted that every group of pulses corresponds to an equal rhythmic value of sustained strings sonorities. The strings section is instructed by the composer to perform their lines plainly, without any coloristic additions, *sans nuances* (as marked on the orchestral score).

*Arcana*, the second of Varèse’s orchestral works which was maintained as complete, was composed between 1925 and 1927. In the present paper, the opening of *Arcana* triggers a discussion about how the orchestra is utilised as a multi-sound generator, producing new sound qualities, while combining aspects of orchestration practices of the past. The initial, characteristic motive of *Arcana* consists of eleven pulses which are later elaborated through various expansions and contractions, in 14 different tempi (Quellette 1973: 91). At the very beginning, the fundamental motive appears at the Bassoons, the Tuba, the Timpani (tuned diatonically) and the Violoncello. This instrumental placement seems to recall the use of the Timpani during the Classical era, where these were often doubled by the trumpets, in order to make the fundamentals of tonic and dominant more prominent to the listener. In this particular work, instead of employing the more common orchestration

The image displays a musical score for the opening of section 12 of the work 'Amériques'. The score is divided into two main sections: 'Harps & Percussion' and 'Strings'. The 'Harps & Percussion' section includes parts for F Horns (3), Harp 1, Harp 2, Celesta, S.D., Cym., B.D., and G. The 'Strings' section includes parts for Violins 1 & 2, Viola, Violoncello, and Contrabass. The score is annotated with various performance instructions such as 'en dehors', 'mp', 'f', 'pp', 'sourd.', and 'sans nuances'. A diagram at the bottom of the score shows a sequence of pulses: '5 pulses (starting at upbeat)', '3 pulses', '4 pulses', and 'etc'. Two callout boxes provide additional context: 'Harps & Percussion' with the note 'Additional vibrations to the Strings', and 'Strings' with the note 'Quasi-homophonic harmonic surface'.

Figure 7. *Amériques*: Combination of Harps and Percussion as a *vibrato* generator (Opening bars of section 12)

role of the Trumpets, Varèse appears to establish the Timpani pitch with more clarity through a unison between the Bassoons and the Tuba. Varèse seems to add extra vibrations to this specific sonority, by assigning the same pitch and rhythmic material to the Violoncelli, in *tremolo* bowing. Analysing this specific passage, various statements can be made about Varèse's approach to synthesising his acoustic, orchestral sounds.

Apart from the "A-B<sub>1</sub>-C" gesture, the composer appears to double this motive in a perfect fifth, employing the Heckelphone, which sounds very close to the Bassoons. This doubled material seems to comprise solely from the second harmonic of each fundamental pitch, transposed an octave lower. Through this method, Varèse seems to attempt to enrich the above motive with a sort of compressed harmonic spectrum of each – A, B<sub>1</sub> and C – pitch. In addition, the very low instruments of the orchestra such as Contrabasses, Contrabass Clarinet and Contrabassoons, play an isorhythmic, contrapuntal melodic line. The use of such material recalls practices of the past, such as the doubling of Gregorian Chant melodic lines by similar motion. Following similar practices, in *Arcana*, Varèse creates a second melodic layer which appears to be an opposite/negative form of this early music idea, by replacing the perfect consonances of the past with dissonances, such as the minor seventh, the tritone and the minor second, creating a second melodic layer which strengthens the overall sonic environment with additional blocks of harmonics.

In the third and fourth bar of *Arcana*, the orchestration uses no percussion, apart from the Xylophone. Most of the instruments perform a motive which consists of a kinetic part, followed by a sustained note. Figure 8 shows examples of this motive, extracted from the part of the fifth Trumpet, separated in A and B sections.

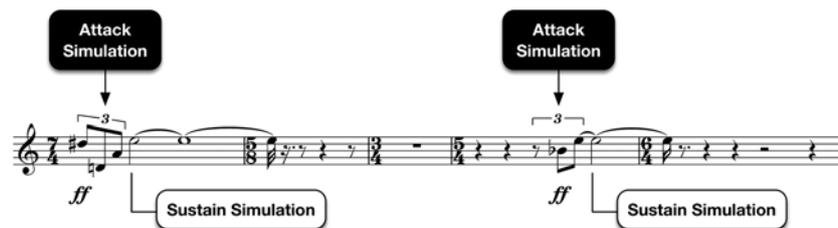


Figure 8. Sound envelope simulation from the fifth Trumpet (bars 3–7)

The structure of those motives seems to simulate the form of a usual sound envelope, which consists of the attack (energetic part), the sustain (static part) and the release. Superimposing various similar sounds, Varèse appears to build a harmonic texture which is formed by perfect fifths (Trumpets), fourths, major thirds (Horns), tones and semitones (Woodwind). This particular formation of intervals sounds like an elaborated harmonic spectrum, developed in time. Figure 9 illustrates bars 1–3 from the opening of the work:

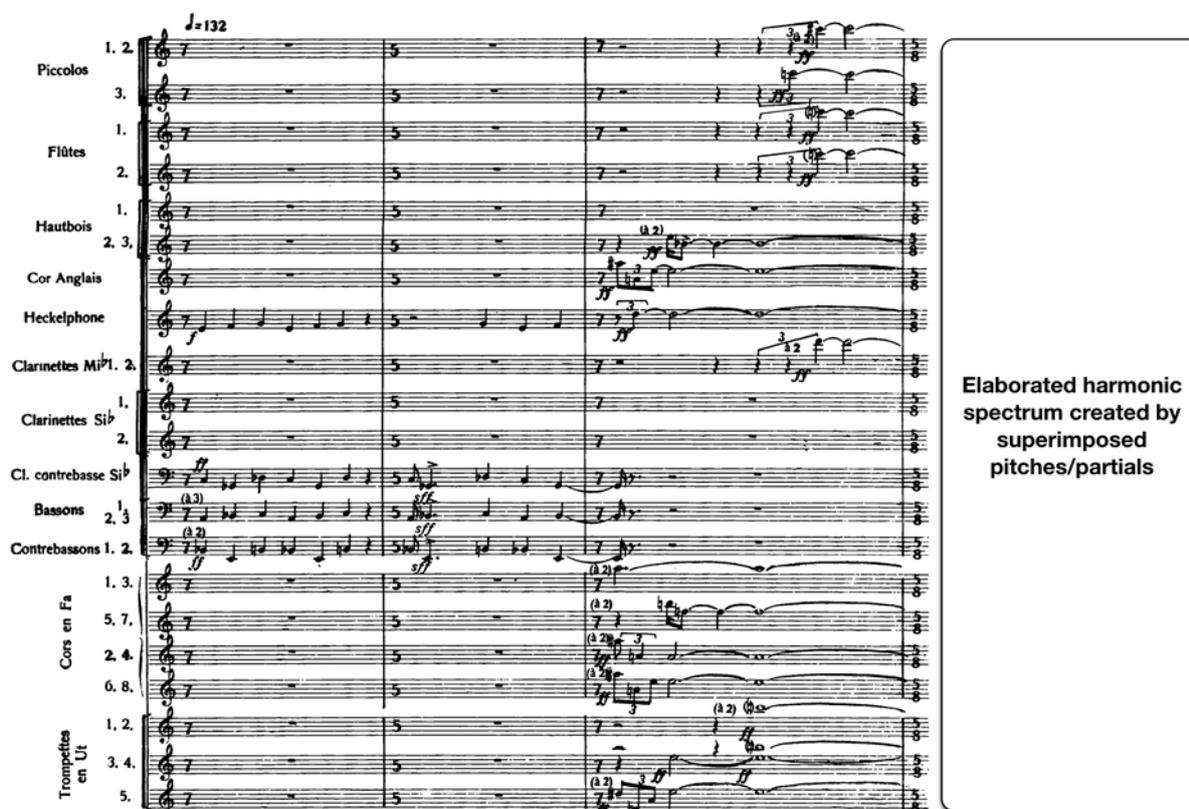


Figure 9. *Arcana*, Spectrum of superimposed, sustained sounds (bars 1–3)

After this exposition, the whole work is based on the compositional development of the two distinct ideas presented above. Similarly to many of Varèse’s compositions, in the elaboration parts, the large percussion section is employed, which is used either to add more vibrations to the existing harmonic and melodic sonorities, or to enrich the built spectra with short, granular sounds, similar to those which can be seen in a typical Fourier analysis, the role of which is of high importance in terms of making the timbre of an instrumental sound recognisable. Figure 10 illustrates an extract from the twentieth part of *Arcana*, where Varèse, along similar lines to the opening of *Amériques*, organises his orchestration in a way which creates a *vibrato* generator to the sustained sonorities. In particular, the Bass Drum is doubling the triplets of the Violas, while the Side Drum performs groups of semi-quavers, creating irregular, repeating pulses to the initial three-note motive, which re-appears by the Clarinets and the English Horn.

Figure 10. *Arcana*, Percussion and Strings as *vibrato* generators (Section 20, bars 5–8)

## 5. Conclusion

To summarise, I would like to borrow Edgard Varèse's own words: "Our music alphabet must be enriched; we also need new instruments... Musicians should take up this question in deep earnest with the help of machinery specialists" (Varèse 1972: 122).

These lines are undoubtedly of great importance, as they highlight composers' desire to form their personal language and compositional identities. Their meaning still stands fresh in terms of influencing, to a higher or lower extent, the next generations of composers, from the 1950s to the 21st century. Varèse's idiomatic instrumental and orchestral writing shows the way to the future, and its impact appears to be inherited in the works of various spectralists, including Gerard Grisey, Tristan Murail, and Claude Vivier, among others. In addition, the majority of the masterpieces of the twentieth century electronic music seem to share and expand Varèse's vision, who, through his unique instrumental and orchestral compositional approach underlined the need of contemporary music of his era for new means of expression, requiring new media as compositional tools. And, to date, this need for finding or inventing means and ways to fulfill one's compositional desires and aspirations, still seems hopefully endless, as it goes in hand with human fantasy, and with the endless desire to explore the unknown.

## References

- Adler, Samuel (2002/1982). *The study of orchestration*. New York, London: W. W. Norton & Company Inc.
- Bauer, Amy (2001). Composing the sound itself: Secondary parameters and structure in the music of Ligeti. In: *Indiana Theory Review* 1, Vol. 22: 37–64.
- Davismoon, Stephen (2004). The transmutation of the 'Old' with the 'New' in the Modernist vision of Edgard Varèse. In: *Contemporary Music Review* 1, Vol. 23: 45–58.
- De la Motte-Haber, Helga (2000). Sound sampling: An aesthetic challenge. In: Braun Hans-Joachim, *Music and Technology in the twentieth century*: 199–206. Baltimore and London: The Johns Hopkins University Press.
- Dodge, Charles, Jerse, Thomas A. (1997/1985). *Computer Music: Synthesis, Composition, and Performance*. United States of America: Schirmer.
- Lanza, Alcides (2004). Varèse: Looking for the New. In: *Contemporary Music Review*, 2, Vol. 23: 59–69.
- Luening, Otto (2004). Varèse and the Schola Cantorum, Busoni and New York. In: *Contemporary Music Review* 1, Vol: 23: 13–16.
- McHard, James (2008). *The future of modern music: A philosophical exploration of modernist music in the 20th century and beyond*. Livonia, Mich: Iconic Press.
- Morgan, Robert P. (1991). *Twentieth-century music*, United States of America: W. W. Norton & Company Inc.
- Ouellette, Fernand (1973/1966). *Edgard Varèse: A musical biography*. London: Calder & Boyars, translated by D. Coltman.
- Risset, Jean-Claude (2004). The Liberation of Sound, Art-Science and the Digital Domain: Contacts With Edgard Varèse. In: *Contemporary Music Review* 2, Vol. 23: 27–54.
- Russolo, Luigi (2004/1913): The Art of Noise (futurist manifesto, 1913). Ubu classics, translated by R. Filliou. Retrieved by: [http://www.artype.de/Sammlung/pdf/russolo\\_noise.pdf](http://www.artype.de/Sammlung/pdf/russolo_noise.pdf)

- Varèse, Edgard (1958/1934). *Ionisation*. New York: G. Ricordi & Co.  
 Varèse, Edgard (1964/1931). *Arcana*. New York: Colfranc Music Publishing Co.  
 Varèse, Edgard (1966/1946). *Density 21.5*. New York: Colfranc Music Publishing Co.  
 Varèse, Edgard (1973/1925). *Ameriques*. New York: Colfranc Music Publishing Co.  
 Varèse, Louise (1972). *Varèse* (Vol. 1). New York: W. W. Norton.

### **Akustiniai instrumentai kaip pirminiai garso sintezės šaltiniai Edgardo Varèse'o kūryboje orkestrui: *Arcana* ir *Amériques***

#### **Santrauka**

Edgardo Varèse'o kūrybos tyrinėtojai vertina kompozitorių kaip ankstyvąjį modernistą ir mokslo pionierių (Davismoon 2004; McHard 2008), kuris sugebėjo numatyti įvairių muzikinio mąstymo aspektų evoliuciją XX a. viduryje ir pabaigoje.

Per 1895–1965 metus kompozitoriaus darbų sąrašas pasiekė 38 punktus: 16 kūrinių yra baigti, 7 liko nebaigti, o 15 neišliko. Kompozitoriaus inovatyvios idėjos, susijusios su orkestro instrumentų garsų manipuliavimu kaip natūraliu, laiko dimensijoje besiskleidžiančiu fenomenu, ypač akivaizdžios Varèse'o kameriniams ansambliams skirtuose kūriniuose.

Kompozitoriaus gyvenamuoju laikotarpiu muzikos medijos aukštosios technologijos tebuvo tik pradinėje vystymosi stadijoje. Tai Varèse'ą pastūmėjo pasitelkti įvairius kompozicinius metodus (neįsivaizduojamus jo amžininkams) ir taikyti juos tuo metu egzistavusiems orkestro instrumentams. Taip buvo kuriama unikali jo kompozicinė kalba. Taigi elementai, atrodantys kaip ankstyvosios adityvinės sintezės ar dažnių filtravimo formos, arba triukšmo įtraukimo ir manipuliavimo pavyzdžiai, yra akivaizdūs jo muzikinėse struktūrose – tai priemonės, formuojančios kompozitoriaus muzikinę identitetą.

Siekiant aprėpti ne tik kamerinės, bet ir orkestrinės Varèse'o muzikos diskursą, straipsnyje mėginama anksčiau įvardytas idėjas identifikuoti kūriniuose *Amériques* (1918–1921) ir *Arcana* (1925–1927). Įvairūs Edgardo Varèse'o orkestrinės kūrybos aspektai nagrinėjami per reprezentatyvius minėtų kūrinių pavyzdžius. Straipsnio tikslas – ištirti specifines tradiciniams orkestro instrumentams taikomas praktikas, kurios stimuliuoja inovatyvių kompozicinio mąstymo būdų, tiesiančių kelius tarp akustinės, elektroninės ir elektroakustinės kompozicijų, atsiradimą.

Pagrindiniai tyrimo klausimai susiję su būdais, kuriais Varèse'o „garso išlaisvinimo“ vizija (Risset 2010) yra realizuojama per instrumentinę kompoziciją. Tai tampa ypač problemiškais klausimais turint omenyje istorinį laikotarpį, kai elektroninių prietaisų ir technologinių medijų naudojimas buvo gana primityvus. Be to, būdai, kuriuos Varèse'as pasitelkė įgyvendindamas savo idėjas, darė įtaką orkestrinei kompozicijai nuo XX a. pradžios.

Straipsnyje mėginama išvelgti ir potencialias postšionbergiškos orkestrinės kompozicijos mąstymo kryptis. Išryškintos idėjos, tapusios inspiracijų šaltiniu ateities kompozitorių kartoms ir inicijavusios požiūrį į garsą kaip į gryną sonorą. Be to, jos tapo pagrindu kompoziciniams procesams, kuriuose sąveikauja elektroninės muzikos principai ir orkestrinio komponavimo metodai. Tokia simbiozė nepraranda aktualumo iki šių dienų.