Traces Through Time

Developments in Edgard Varèse's essential material

in *Hyperprism*, *Intégrales* and *Déserts*

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Edgard Varèse has like every other influential artist a very particular and unique vocabulary, which he developed and continuously refined during his artistic career. In the following analysis "essential material" refers to this vocabulary.

The term "essential" is somewhat problematic as it suggests a hierarchy: If some materials are essential there also have to be less important and negligible elements. And there are indeed several elements in earlier works by Edgard Varèse of which one could think of as discontinued threads. This analysis however will look for and concentrate on materials which frequently reoccur in Varèse's output. The main criteria used to identify certain materials as essential will be the quantitative frequency in which these elements appear. This frequency shows the privileged role these elements play in Varèse's thoughts as he dealt with them repeatedly, and developed and changed their nature.

This analysis will try to trace these changes by comparing *Hyperprism*, *Intégrales* and *Déserts* and focusing on two essential materials: the "straight line" as a horizontal and the "pyramids" as a vertical element. These two elements take a specific role in Varèse's work and are often presented in a particular combination, where the pyramid is spanning out the horizontal line into a vertical space. Below, the concept of the straight line and the pyramid will be described in detail.

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Straight lines

Segments which fall under the category of straight lines are larger sections in the global form of a piece and in the particular case of *Hyperprism*, *Intégrales* and *Déserts*, these blocks are between twelve and twenty-nine measures long. Their placement is often at the beginning of the piece and their boundaries are clear-cut: They posit a statement and are being cut off at the end by a different material.

A horizontal harmonic axis serves as a tonal center of these passages and this axis maintains this function during the whole section. It is represented by a line of one or two voices which repeat in an insisting way and in irregular durations the same instantiating gestures. Different harmonic planes are put in close proximity as a response to the positing nature of the horizontal line. These planes define their position in reference to the horizontal axis either as a

complement or an opposition. Inflections or collisions then create energies which set the music in motion.

Another characteristic of these sections is a certain timelessness: It seems like the time stands still as there is no development of thematic or melodic material. It is rather a state that repeatedly presents the same contour and behavior. The ending is always a cut – it could have been going on but instead new material is cutting off and replacing the previous section.

Hyperprism

The straight line in *Hyperprism* is presented in the opening section (m. 0–14). This section is divided into seven relatively similar sized parts. The beginning consists of the initiating percussion attack and the first call of the tenor-trombone, which remains unanswered (m. 0–2). In the next four sections the trombone alternates with voices that answer this call with imitation or opposition. Every entrance of the trombone marks the beginning of one of these four sections (m. 3-9). The first horn then imitates the trombone for the last time and at a lower dynamic level (m. 10/11) followed by two new instrumental groups – trumpet and woodwinds – which close off this whole section.

This opening part consists of four layers:

Soloistic main voice

After an explosive percussion attack the tenor-trombone opens the piece with a solo, which has a very expressive, vocal-like gesture that instantiates the piece with a "call". The first call is the most basic and reduced version of this gesture – just a sustained single attack – and remains unanswered. The trombone reiterates the call persistently and almost stubbornly in irregular intervals, following three different models: a sustained single attack (m. 2, 6), repetitions ending with a sustained note (m. 4/5, 7/8) or a sustained attack, followed by irregular repetitions (m. 3). The vocal-like expressivity of this line stems from its rich ornamentation and the trombone, with the opportunity for gapless glissandi – similar to the voice – is an ideal instrument to realize that. The c-sharp is being reached through glissandi alternating from above or below; there are seven ornamented and eleven non-ornamented attacks. Over the course of this section the amount of ornamentation increases: It is starting out as a non-ornamented single attack (m. 2), followed by a short glissando (m. 3) and a longer glissando (m. 4), finally reaching densely

repeated ornamentations (m. 7/8). The last ornamentation in the french horn (m. 11) – this time in steps – appears as an echo, reduced to *mf*.

All attacks in the solo trombone are accentuated, clearly positing themselves in the dynamic range between *f* – *fff*. It is then always decreasing, first to *p*, then to *mf*, and at the end to *ppp*. This dynamic structure reinforces the interplay between the soloistic voice and the secondary voices, as the latter ones always have increasing, "answering" dynamics. The first call is an exception though: Because it remains unanswered, the dynamic does not have a reference point – it stays in *ff*.

Imitation

The next layer is being presented by the french horns. The group or a part of it always plays during the rests of the trombone, as a response to its call. They start when the trombone is still playing, so that the beginning is always overlapping. Although they play the same pitch, the horns seem distant because of their softer sound. Compared to the trombone they also appear less vocal-like expressive, because they have a more regular rhythm and less ornaments. Instead they seem like a more abstract and removed layer that is being put against the trombone's expressivity. The only exception to that is the last solo of the first horn (m. 10/11) which is a clear imitation, but appears remote because of its low dynamics.

The dynamics are almost exclusively increasing, which provides the basis for an interplay between the trombone and the horns. Every horn entrance is at least at a similar or lower dynamic level than the trombone, which allows them a smooth emergence from the solo voice. They then swell and present themselves as a strong group that answers the call of the trombone.

The imitation of the trombone by the horn section starts off with a single attack of the first horn (m. 3). It is followed by the entrance of three horns (m. 5), then – decreasing – two horns (m. 7), and, at the end (m. 8–11), one horn, whose solo signals the closure of the section and the transition to the "resolution".

The rhythmic structure of the horn section is simpler and more regular than in the main voice. But one can still find references to the trombone part (e.g. the triplets in the horns, m. 7 – trombone, m. 3). The first two responses (m. 3–6) are simply of swelling character without

accentuating rhythm. The responses towards the end (m. 7, 10, 11) orientate towards the expressivity of the main voice through a more complex rhythmic structure.

Opposition

The bass-trombone is the third layer and also has a soloistic voice like the tenor-trombone. The bass-trombone also "answers" the calls of the tenor-trombone, but more as an opposition than an imitation, because of several features: It opens up the low register two octaves below the tenor-trombone and the horns, willingly misses an imitation and contrasts the c-sharp of the main voice with a d-natural. Time-wise it is also shifted against the main voice by playing during the rests of the tenor-trombone. The rhythm is very reduced: It only presents sustained notes, which focus on three basic concepts of dynamic contours: increasing, decreasing and the combination of them.

Independent force

The percussion is the fourth and last layer in this opening section of *Hyperprism.* It does not have a direct structural relationship to the other layers of this part, but still fulfills important functions: Strong attacks with cymbals, tam-tam, bass drum and lion's roar open up the piece. With their dynamics in *fff*, they prove as a paradigmatic opening gesture and clear the stage for the solo of the tenor-trombone. Over the course of the piece the percussion turns with its march-like character into a pacesetter, that opposes to the free and indulgent voice of the trombone. This difference is also of affirmative character: The percussion creates the framework within which the expressivity of the trombone can exist. It therefore also reinforces the positioning and instantiation of the soloistic voice. The percussion also contributes to the abrupt change of timbre that occurs at the end of this section (m. 12): The vertical march-like gestures disappear and are being replaced by sustained and quiet sounds of cymbals, tam-tam, siren, etc.

The last portion of this opening section (m. 12–14) in many ways has the function of a "resolution", as it reverts or readjusts positions that have been instantiated in the opening at almost every level.

For the first time the trombone changes its harmonic center and moves from the c-sharp to the c-natural, which it sustains on a long decrescending note. In addition to that, new instruments are being introduced – flute, clarinet and trumpet – and they present with the c-sharp/c-natural combination a diametrical harmonic opposition to the c-sharp/d-natural combination of the beginning, exploring the upper register for the first time in the piece. The abrupt change of the percussion sounds also reinforces the cut that new harmony, new register and new timbre suggest.

There is a remarkable hierarchy between these four layers (soloistic main voice, imitation, opposition, independent force) that are being presented in the opening: there is a foreground and background, a main voice and imitation, positioning and affirmation. The function of the layers is bound to the instruments. The trombone *is* its function as a soloist and it does not give it away. It is similar with the horns, the bass-trombone and the percussion: Functions do not change the instruments. This is of particular interest in comparison to *Intégrales* and *Déserts*, which will be analyzed below.

Intégrales

The opening section of *Intégrales* is divided into eight sections. In the first section the clarinet is positing itself as a soloistic main voice with a "call" that also remains unanswered. In the following six sections, this main voice, represented by the clarinet, the oboe or the trumpet, alternates with responses from the ensemble, which presents a vertical complement to the single line. The last section starts out like the previous ones with the main voice and the vertical responses, but instead of a long decay it is being followed by a rapid stratification of all melodic instruments, which opens the register to the upper and lower extremes and closes the first section with a big tutti crescendo.

There are three layers:

Soloistic main voice

The piece starts out with a solo in the high register. The high e-flat-clarinet is playing in f and is of calling and instantiating character. An ornamented entrance is often followed by accentuated

and insisting repetitions on the same pitch and the phrase ends in sustaining and slowly decaying the last accentuated attack.

Several instruments represent this line: The e-flat-clarinet plays the first four entrances (m. 1, 4, 7, 8) followed by: c-trumpet (m. 10), e-flat-clarinet (m. 11), oboe (m. 12), e-flat-clarinet (m. 14), d-trumpet (m. 18) and again the e-flat-clarinet (m. 22). Obviously the clarinet is the main representative of this line. But one could also see the instrumentation as a "chromatic ornamentation", if one is willing to interpret trumpet and oboe to be a timbral half-step away from the clarinet.

The ornamentation of the initial attack of each phrase is simple and precise: Two clearly defined intervals reach the final pitch always from below. Repeated and non-ornamented attacks follow this initial jump, with the exception of the first call. But it is not only the attack that is being ornamented: There are other ornaments around the central pitch coming after the attack and opening the harmonic field downwards via chromatic zig-zag lines (see clarinet, m. 11 and trumpet, m. 18). These ornaments are also rhythmically clear and emphasize the quarter-note pulse. This rhythmic precision creates a vertical form for the horizontal line and relates it to the percussion.

Harmonic complement

Brass and woodwinds appear as a complementary layer. Clusters around the b-flat of the main voice are transposed in octaves and map it into the vertical space. Woodwinds open the register above the main voice, whereas the brass, temporally shifted ahead, explores the low register. Through this temporal shift, the split in registry and the different dynamics, woodwinds and brass appear as two complementary parts of the same group.

Percussion

In the beginning the percussion is holding back, starting out with quiet attacks on gongs and tam-tam (m. 4). The following snare-crescendi serve as a subtle pulse that provides vertical anchorage for this section. This tendency culminates with the erupting march that is being presented at the prominent place of an ensemble rest (m. 12). The relation between the percussion and the main voice is growing stronger, as the latter is starting to syncopate the quarter-pulse of the march. Furthermore, the absence of the percussion in measures 24–28 and

the short, but intense percussion solo in measures 29–31 mark a turning point in the formal development of the piece.

In the rhythmic structure of the main voice, all accentuated and sustained notes, except for the initial one, are placed on offbeats. Through that the main voice distances itself from the rest of the ensemble, which catches up on every entrance of the woodwinds which falls again on the downbeat. An exception to this is the attack of the d-trumpet (m. 19), which is the only attack of a sustained note that comes on a downbeat – and, consequently, it does not receive an answer from the ensemble.

The dynamic of the main voice is very affirmative, positioning itself as a soloistic line between *f* and *fff*. Here the ensemble is also proving as a power that tries to compensate the soloistic position of the main voice. The entrances of the ensemble always have a similar dynamic and the dynamic of the soloistic voice only decreases together with the ensemble.
The brass functions as a dynamic antipode. Although they are part of the same group, they have their own temporally displaced crescendi.

Déserts
The opening of *Déserts* is characterized by a calm and almost static attitude. There are three layers that all rely on the same harmonic concept (stacked fifths) which they project into different vertical areas. Because of their clear harmonic concept and their registral distribution, these layers appear almost like geometrical planes, which collide in a harmonic space. This superimposition creates energies that set the music in motion.
One can divide *Déserts* into five sections, which are characterized by different harmonic domains. The first part presents the first layer: It positions itself and opens a harmonic space, which remains without echo (m. 1–4). In the second section the trumpet presents the repetition of the initial attack in a new timbre. More important, a second layer is being put against the first one. These planes collide and the released energy sets the static columns of the first plane in motion and creates gestural contours (m. 7).
The next section marks a turning point, in which the harmonic axis of the first layer – the middle c of the stacked fifths f–c–g – is being repositioned in order to introduce a third plane:

b-flat–f–c (also stacked fifths). The horn is sustaining and emphasizing this axis, whereas trombone and tuba coat the new context.

The fourth section (m. 16–20) is illuminating the space under the new harmonic conditions and the c-sharp, signaling the final "pyramid" and the closure (m. 21f.) of this whole section, is being introduced and put next to the c-natural. Right before that, in measure 20, the beginning gesture briefly shows up again – but now remote in the chimes and trumpets in ***ppp*** with *sordino*. After the vertical explosion in measures 21/22 the ***ff*** of the tutti is decreasing and opens the space for the entrance of noisier percussion instruments (see timpani, m. 23).

There are three layers:

1. f – (c –) g

This plane is starting out the piece with clear, column-like accents, especially distinguished by the characteristic sound of the chimes, which are doubled by flute, clarinet, piano and xylophone. The combination of the chimes with the wind instruments remains as a strong identifier for this plane throughout the whole beginning section.

These accents employ a simple rhythmic model: short – long. The first accent (m. 1) is on the downbeat, whereas the second accent is syncopated – they are three eighth-notes apart. The repetition (m. 5, 6) shows a similar proportional structure: If one thinks of the metrum as *alla breve*, the first attack in the trumpet is also on a downbeat and the woodwinds in the following measure again on the offbeat. The durations are augmented: Instead of three eighth-notes, they are now three quarter-notes apart.

2. d – (a–) c

This layer is opening the low register and puts a new, but structurally identical harmonic plane against the first one. Horns and trombones immediately create a darker, more pungent sound world.

Similar rhythmic models are being employed, referring to the numerical proportions of the first plane. Here however, they appear to be more subversive – woven into the columns of the first plane, which are already set in motion. The first two entrances of the structure (see horns, m. 6, and bass-clarinet and horns, m. 7) are three quarter-notes apart, and the second and third entrance (see bass-clarinet and b-clarinet, m.7) are three eighth-notes apart.

The gestural character of this plane sets in motion the musical space and these movements increase and culminate with the triplets in measures 12/13, which introduce the transition to the third plane.

3. b – (f –) c/c#

The third and last layer in the opening section of *Déserts* presents itself – similar to the first plane – as a static, column-like structure. The harmonic space is opening further down and similar instruments as in the second layer enable it to contrast the clarity and brightness of the first layer.

This plane does not present any clear rhythmic positions: It reduces itself to decaying attacks.

Comparison

Comparing *Hyperprism*, *Intégrales* and *Déserts* under the prism of the "straight-line"-concept, one can see several elements, which remained in Edgard Varèse's artistic repertoire over such a long timespan. The following passage tries to reveal these elements and their history.

A remarkable similarity of the three pieces is their incantatory opening, which exposes a horizontal line. The trombone in *Hyperprism* as well as the clarinet in *Intégrales* start out the piece as a soloist, and although it is not a single instrument that presents the line in *Déserts*, the specific combination of these instruments creates one meta-instrument. They all open the piece with a strong, positing and initiating attitude. This first initial "call" always remains unanswered. It is not until the second call – an insisting repetition and intensification – that opposing or complementing structures occur.

The horizontal lines in the opening sections of the three works put in comparison reveal interesting developments: The line in *Hyperprism* is vocal-like and expressive. This is achieved by the gapless glissandi of the trombone, the ornamentations, the free and irregular rhythms as well as by the insisting and accentuated repetitions. The opening line in *Intégrales* appears much more restrictive: There is only one form of ornamentation, i.e. two clearly defined intervals which always come from below. Furthermore, the rhythm of these repetitions is much more precise – syncopating the quarter-note pulse – which provides a stronger vertical

anchorage to the line. The biggest development can be found from *Intégrales* to *Déserts*: In this late work, the line is nothing but a harmonic structure. Gone are melodies and ornaments. These column-like attacks, which still have the function of a horizontal axis that grounds the section, do not resemble in any way a vocal line. They appear as a condensation, as a – to its basic functions reduced – form of a horizontal line: pure structure.

A similar process can be observed in the organization of durations: The line in *Hyperprism* is dominated by irregular repetitions, which mostly end with a sustained note. *Intégrales* offers similar concepts: The repetitions are more precise, follow rhythmic patterns and the sustained note at the end develops two main functions: It is the antipode to the ornamented jump, and the end of the phrase. *Déserts* reduces these patterns in an extreme way: What is being left from the repetitions and the sustained notes is a skeleton – the most condensed form of the inherent principle: "short – long". All ornaments and repetitions are omitted and the only thing that stays are two points: opening and ending.

Another interesting observation can be made by looking at the development of the function of the different layers in the "straight line". There are two processes of dissolution:
In *Hyperprism* the function of the solo voice is bound to the instrument, the tenor-trombone: It is the soloist *and* the structure. Similarly, the horns *are* the imitation and the bass-trombone *is* the harmonic opposition – no other instrument is replacing them in their function. One can observe a loosened approach in *Intégrales*: It's not anymore just one instrument that serves as a main voice, but the line is switching from the clarinet to the trumpet, to the oboe and back to the clarinet. In *Déserts* the structure of the horizontal line is detached from the restrictions of one single instrument. It now consists of several instruments which, because of their structure, do not step out as expressive single voices, but rather appear as one meta-instrument. Even more: The structure is not even necessarily bound to this meta-instrument; lines are being presented in new timbres and wander freely between the instruments.
The second dissolution process concerns the layers themselves: In *Hyperprism* the layers have a clear hierarchy because of their function. The solo voice is in the foreground, whereas the imitation and harmonic opposition tend to be more in the background. In *Intégrales* the percussion seems to have the function of a quiet pacesetter, which only steps out in its march-

like gestures. There is also – if not a hierarchy – at least a clear opposition between the solo voice and the ensemble, that contrasts the soloistic voice and tries to compensate for it. In *Déserts*, there are no hierarchies and no for- or background. Different planes have equal importance and every single one has a specific function. Collision in the geometrical space is their only interaction, which sets free musical energy and movement.

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Pyramids

Another characteristic example of Edgard Varèse's essential material are explosive vertical stratifications which occur at significant formal turning points in all of his works. In this analysis they are being referred to as "pyramids", because of the staggered and vertical ascending entrance of each note which reminds to the architecture of pyramids.
In all following examples these pyramids employ the whole apparatus of melodic instruments that is available in the particular piece. This block of sound builds up in several steps, which have irregular entrances and create a dynamic densification which either abruptly ends after a big crescendo or slowly decreases. They present a broad harmonic spectrum which in some cases includes the chromatic totality.
A selection of these pyramids from *Hyperprism*, *Intégrales* and *Déserts* will be analyzed in the following passage. A graphical matrix maps out the structure of the entrances and reveals underlying patters. The y-axis represents pitch with the bold dash being middle c and the other dashes showing the distance of respectively one octave above or below. The temporal structure is being represented by the x-axis: each line is one eighth-note, only showing the entrances, not the durations.
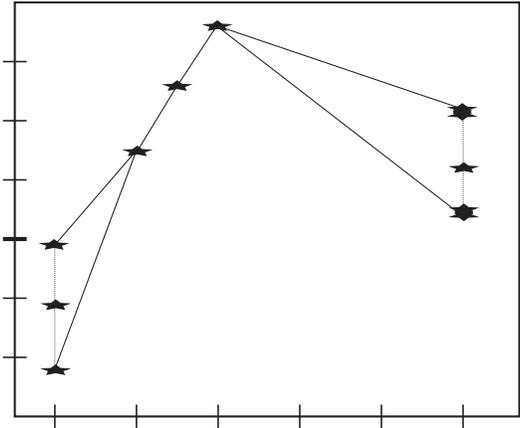
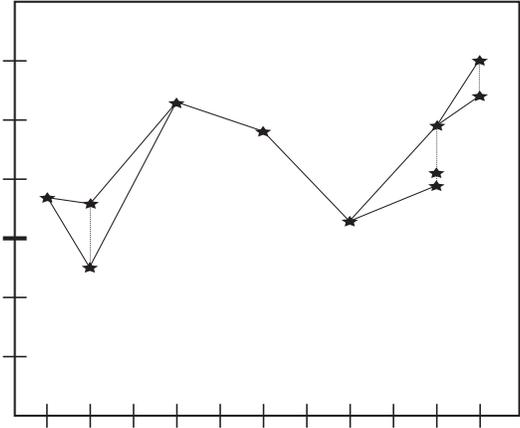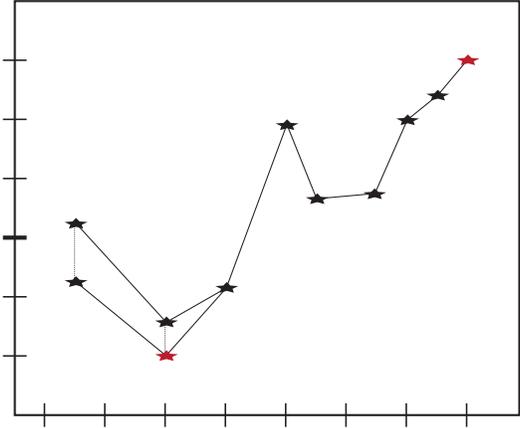Hyperprism   1. m. 40–43
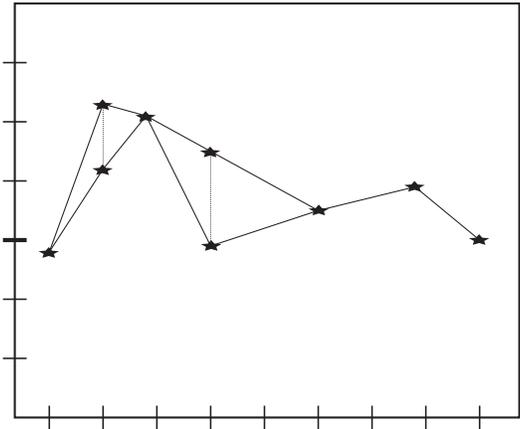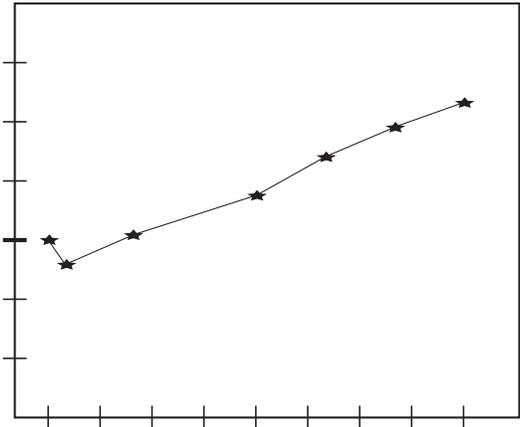

2. m. 85–90
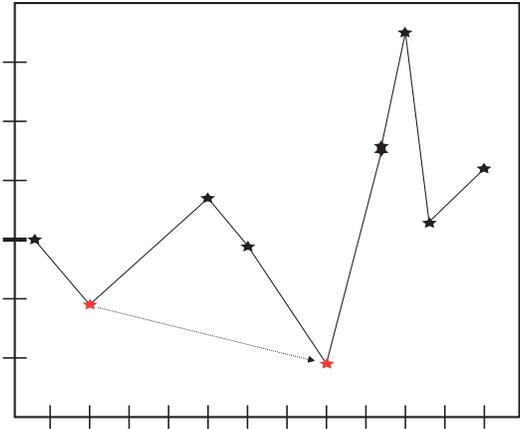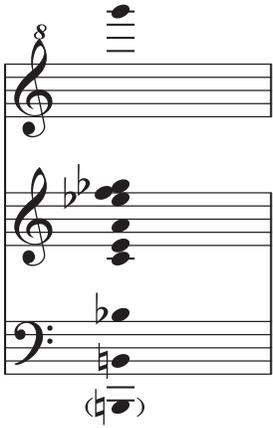
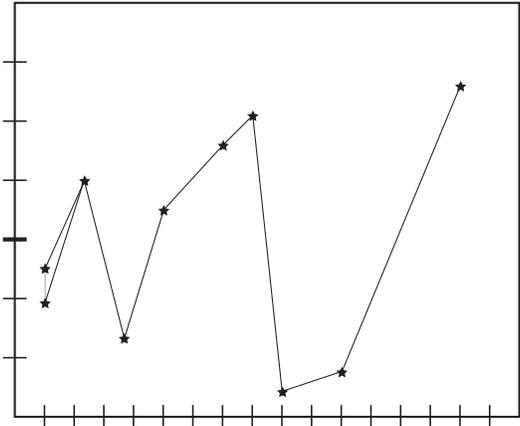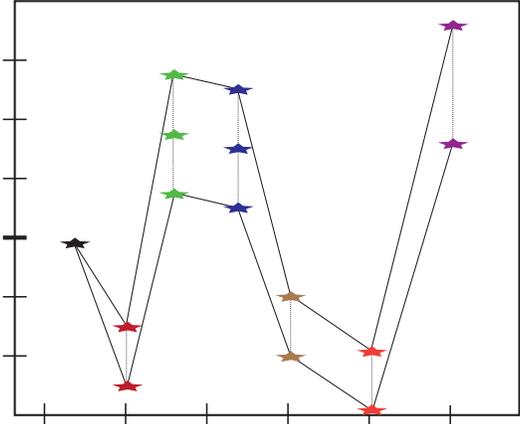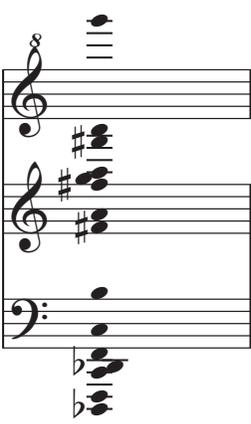Intégrales   1. 6 before **3**

2. 7 before **13**

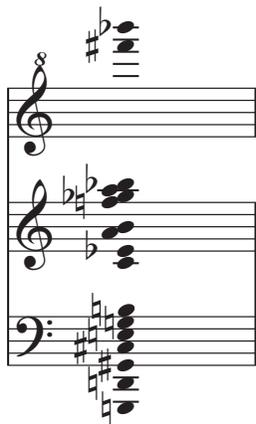
3. 2 before **19**

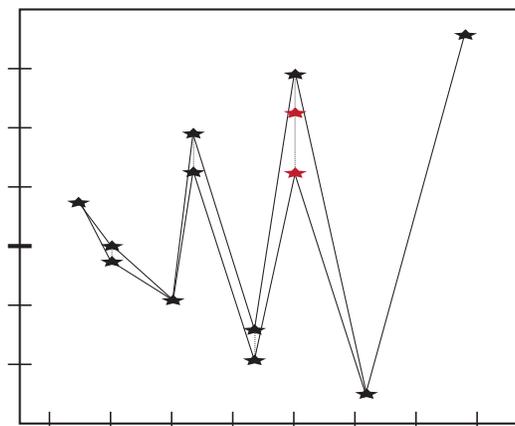Déserts   1. m. 21–22
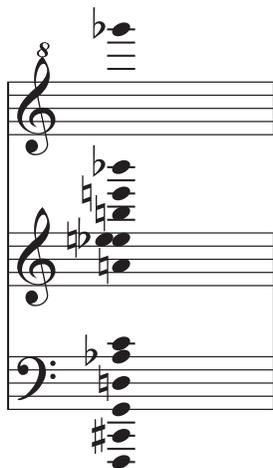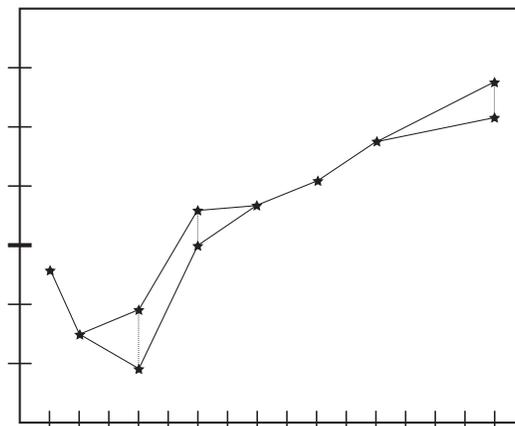

2. m. 115–116
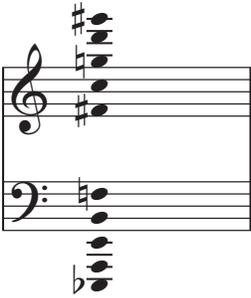
3. m. 149

4. m. 204
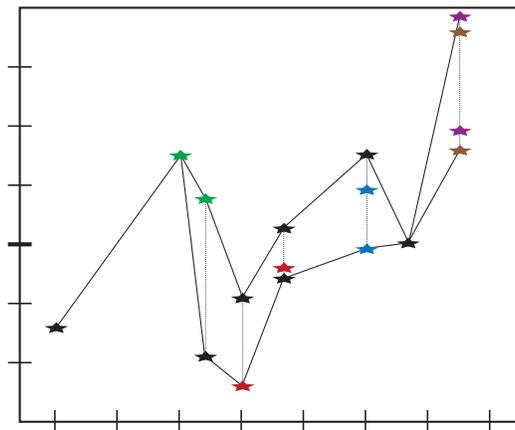
5. m. 270

6. m. 304–307

Comparing the harmonic structure and the architecture of these pyramids, one can observe several developments.

There is a certain pattern underlying the architecture of these pyramids, which emerges over this long timespan between *Hyperprism*, *Intégrales* and *Déserts*. It is characterized by the first entrance being in the middle register and one or more zig-zag lines explore step-by-step the extremes towards the low or high register. The second pyramid in *Hyperprism* shows this tendency, as well as the third pyramid in *Intégrales*, but in both versions it is not the end that presents the extremes. In *Déserts*, every pyramid reaches its extremes in the last entrance. There are different patterns, e.g. with only one buckling (pyramids 1 and 6, which, by the way, are the first and the last pyramid in the whole piece) and more complex, less straight patterns (pyramid 2, 3 and 4). The fifth pyramid presents the pattern probably in its most purified version: It starts out in the middle register and explores in several zig-zag lines the upper and lower extremes step-by-step, always going further and ending at top end of the range.

The harmonic structure of the pyramids in *Hyperprism* are strongly influenced by the available instruments. There is the tendency to avoid doublings, which has the simple consequence that nine melodic instruments form a nine-voiced chord. There is one octave doubling in *Hyperprism*. However, it does not appear at the same time as the bass-trombone plays them sequentially. *Intégrales* shows a similar coupling of the harmony with the apparatus of available instruments: Two of the three pyramids have chords of eleven different pitches which represent eleven available melodic instruments. Only the third pyramid shows a real octave doubling, vertically framing the low and high end of the chord. In *Déserts*, the harmonic structure seems to be more independent from the instrumental apparatus. Harmony can be dealt with more freely as there is a significantly larger pool of melodic instruments to choose from: Some pyramids employ the chromatic totality (pyramids 4 and 5) and some reduce the harmonic content to just seven different pitches (pyramids 1 and 3). There are many octave doublings (in the matrix represented by identical, non-black colors) as well as doublings in the same register.

Another interesting development concerns the vertical distribution of the chords. The distribution is relatively uneven in *Hyperprism* and *Intégrales*, creating clusters in the middle and gaps towards the upper and lower ends of the chord (see *Hyperprism*, pyramid 2, and

Intégrales, pyramid 2 and 3). In *Déserts* however the vertical distribution is much more regular: Each pitch has its own space where it obtains a specific function, in analogy to the previously discussed equality between the harmonic planes. It does not try to avoid tonality through the ambiguity of clusters, but a strong harmonic concept allows a clear and non-hierarchic use of the vertical space.

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In comparing *Hyperprism*, *Intégrales* and *Déserts* one can find developments in the materials that Edgard Varèse frequently used. Whereas at the beginning, many of these essential elements are characterized by their strong affinity to instrumental or quasi-vocal origins, there occurs a particular purification and distillation of the underlying concepts. These developments can be seen as a liberation of the structure – as a mind model – from the conditions and constraints of the instrumental apparatus. The horizontal line in the opening of *Hyperprism* is conceived through the trombone, whereas in *Déserts* the line presents itself as an independent structure, moving freely between the instruments. What appears in *Intégrales* as insisting, diction-like repetitions with a sustained final note is being condensed in *Déserts* to the rudimentary rhythmic concept of "short" and "long". One could easily add to this list.
In analyzing these pieces, one can see how Edgard Varèse questions, reduces and abstracts his unique vocabulary in order to present it in a clearer, richer and more versatile form.