

VARESE: THE CHAMBER WORKS OF THE 1920's

Detailed Analyses of
Hyperprism, Octandre and Intégrales

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PREFACE

The object of my analysis of Hyperprism, Octandre and Intégrales is to explain the mechanics of the construction of Varèse's works and, thereby, reveal his concept of music, in general, and the consequent treatment of the various parameters of music, in particular. These analyses have been written in a way that assumes almost constant reference to a score. In the text I refer the reader to bar numbers in the music for ease of the accurate pin-pointing of specific events. In the score of Intégrales bar numbers can be easily calculated because the rehearsal figures occur at ten-bar intervals; starting with figure [1], which is bar 11, therefore, figure [2] is bar 21 etc.

When discussing the length of sections within a work I sometimes refer to the number of beats and at other times the length of a section is described in seconds. The reason for this is that when the portion of music being discussed is governed by a single tempo indication the length can accurately be described in number of beats, but when changes of tempo are involved a time value is necessary in order to be able to effectively compare the length of one section with another.

Note-groups describe all the chromatic tones used in between, and including, the named outer notes in ascending order, i.e. the note-group B-F consists of the tones B, C, C#, D, D#, E, F.

In order to simplify matters, brass and woodwind instruments are collectively described as "wind" instruments and wide intervals, such as 1 octave and a major 7th I describe as a compound major 7th.

To facilitate easy reference the 'Musical Examples' are contained in a separate volume.

PART I

INTRODUCTION

CHAPTER ONE

INTRODUCTION: VARÈSE'S STYLE

The style of Varèse's chamber works of the 1920's can, in simple terms, be described as an uncompromising reflection of the mechanical age, realised in music which is confident, even jubilant, in its modernity. Varèse was obviously a composer who relished the challenge of the twentieth century, probably because he was trained as an engineer and mathematician and, as a man of science, he would have seen the future as a new world to be explored and exploited. By the 1920's Varèse was established in New York and for him the peoples and places that surrounded him was another kind of new world. As Stockhausen said when talking about Varèse:

'Anyone living today ... is confronted daily with the hurtling together of all races, all religions, all ways of life ... of all nations. In works by the musician Varèse this bubbling of the cauldron is aesthetically portrayed ... New York, that prime blueprint for a world society, is without question an indispensable experience for the contemporary artist. Ideas one might have about possible integration, about a coherent unification, or about possible syntheses of the influences issuing from all parts of the globe, all these must be tested against living experience if they are to lay claim to any truth.'¹

Unlike many composers in the early 1900's, Varèse did not experience the inner doubts and uncertainties of a future in the modern age, nor the longing to preserve the spirit of nineteenth century music by dressing it up in the finery of a twentieth century system. This criticism, however, may be levelled against other composers, Schoenberg among them, of whom it could be said that his head was in the twentieth century but his heart was still in the Romantic Age. As Hans Eisler said 'Schoenberg is the true conservative, he even created a revolution so that he could be a reactionary.'²

The essence of Varèse's style rests on his approach to the two fundamental elements of music - sound and rhythm - and the manipulation of the variety within each of these elements is the basis for all his compositions from

the 1920's to the end of his life. However, he does not use sound for sound's sake, as the impressionists did, but as a structural component. Rhythm was vital to Varèse because it gives shape and form, just as the form of an object can only be perceived when light is present. Varèse's treatment of all the other parameters of music rests on this initial approach.

ORGANISATION OF PITCH

NOTE-GROUPS

The most common of all Varèse's techniques that involve the organisation of pitch is the use of note-groups. When Varèse uses a note-group he limits himself to using all the chromatic tones between two particular notes. A note-group may consist of any number of tones ranging from two to twelve. A note-group usually forms the basis for the construction of a musical cell - a musical idea that is *complete in itself* - whether it be a melodic line, a chord or a whole passage. It fulfills a similar function to "key" in diatonic music and when two or more independent note-groups are in operation simultaneously it is Varèse's equivalent to polytonality.

The oboe, in the first three bars of its solo, at the beginning of Octandre, for instance, is limited to the notes between D and Gb. This note-group, not only, supplies the notes for the oboe solo, but also becomes an important structural component of the whole work.

In bar 29 of the same movement, Varèse constructs a chord which uses all the notes from C-F, thereby, indicating the unity of that group of instruments at the moment at which all the tones are sounded.

SOUND MASSES

One of the most important and prominent features in the style of Varèse's music is the "sound mass", which may be defined as a sound which forms a complete musical entity. A sound mass may consist of one instrument playing a single note or several instruments playing many notes, but

both must be distinguishable as a self-supporting musical cell. A passage of music may contain one sound mass or several sound masses which interact in various ways. When more than one sound mass is used in a particular passage each sound mass uses, either, a different note-group or a single note-group but with each sound mass using different notes within that note-group. Therefore, each sound mass's character could be said to be, in part at least, determined by the note-group it uses. Varèse explained his ideas about sound masses at a lecture he gave in 1936 when he was describing how he could use new instruments and, although, these words were spoken over a decade after *Intégrales* was written, his thoughts still describe the way he wrote for traditional instruments in the 1920's.

'When new instruments will allow me to write music as I conceive it, the movement of sound masses, of shifting planes, will be clearly perceived in my work, taking the place of the linear counterpoint. When these sound masses collide, the phenomenon of penetration or repulsion will seem to occur. Certain transmutations taking place on certain planes will seem to be projected onto other planes, moving at different speeds and at different angles. There will no longer be the old conception of melody or interplay of melodies. The entire work will be a melodic totality. The entire work will flow as a river flows.'

Varèse uses the words, penetration, repulsion and transmutation, words which I will use in my analysis to describe certain events that take place.

Penetration occurs when two, or more, sound masses meet and, as a result of their collision, one sound mass is absorbed into the other. When one sound mass collides with another reaction takes place and some aspect of the sound masses involved will change, thereby causing transmutation.

Repulsion occurs when two or more sound masses collide and they do not mix. Such an event is usually followed by a development of the conflict between those sound masses.

Example 1 shows graphically what happens when four sound masses collide and penetration occurs, resulting in the transmutation of one of the sound masses.

The passage from bars 11-35 in the second movement of Octandre provides an example of how Varèse expresses the phenomenon of repulsion. In this passage there are four sound masses; the first is formed by the trombone solo, which acts as a unifying element, providing a stable centre around which the three conflicting sound masses interact. The three conflicting sound masses are:

- 1) Piccolo/clarinet.
- 2) Clarinet/oboe/trumpet.
- 3) Bassoon/trumpet/double-bass.

The repulsion which exists between these sound masses is expressed by the way they constantly answer each other with short emphatic statements. A clearer idea may be gained of the interaction taking place by seeing this passage in graphic form. (See example 2 where the different colours represent the various sound masses involved.)

Varèse tries, as far as he can with traditional instruments, to treat sound masses almost as visual objects, creations that can be manipulated in space as well as time. Even in these early works, two decades before the arrival of what we now know to be "electronic music", Varèse uses sound masses to depict, not only, the effects already discussed, but also 1) a sound mass changing shape as it moves through time (Hyperprism bars 40-41 and Intégrales bars 1-29 and 32-52), 2) different sound masses colliding and breaking up (Hyperprism bars 45-59), 3) a sound mass being created from a small cell of sound (Hyperprism bars 1-13), 4) sound masses that cease to exist, only to return, often in a slightly different form, later on in time (Octandre second movement Bars 67-third movement Bar 40 and the oboe solos in Intégrales bars 161, 191 and 200). All of these effects were, later, achieved with the aid of electronic instruments and multi-channel recording, but it is remarkable that Varèse was able to obtain the same results, albeit in a limited way, with traditional instruments.

PITCH

HARMONY

Traditionally, the purpose of harmony has been to unify several notes into a coherent whole, as Schoenberg stated, in "Fundamentals of Musical Composition", in the music, from the period of Bach to Wagner, 'coherent harmony reinforces relationship'.⁴ When Varèse's music is discussed, harmony must be thought of as the vertical organisation of pitch, where the isolation of a certain sound from another is more important than their integration. The object of Varèse's harmony is that the colour and intensity of each note, or small group of notes, within any chord can be clearly distinguished and related to other sound around it.

Within most of Varèse's sustained chords, for instance, there are a few notes which project more strongly than the others. These prominent areas of sound within a chord Varèse calls "zones of intensity".

'The role of colour or timbre would be completely changed from being incidental, anecdotal, sensual or picturesque; it would become an agent of delineation, like the different colours on a map separating different areas, and an integral part of form. These zones would be felt as isolated, and hitherto unobtainable non-blending (or at least the sensation of non-blending) would be possible.'⁵

The final chord of Hyperprism is an example of a sustained chord that has two zones of intensity. It is typical of the kind of loud, sustained chord Varèse often used to close a section, a movement or, indeed, a whole work. It has very wide intervals at the extremes of the chord in order that the zones of intensity may stand out more prominently. The zones of intensity help to put the chord into perspective, giving it, what one would call, in a visual analogy, a three-dimensional effect. The zones may be likened to the brighter colours in a painting which are used to make certain areas stand out and attract the viewers attention.

Bearing this analogy in mind, it then seems to be no coincidence that the instruments selected by Varèse to play the notes in the most important zone of intensity, happen to be the brightest sounding of all the instru-

ments used in the orchestra. The primary centre of tension in this chord is the Eb, F, F# in the treble stave, which is played by the Eb clarinet and the two trumpets respectively. The second area of tension is the Bb and C played by the horns. This zone of intensity is of secondary importance for the following reasons:

- 1) the interval of a tone, rather than a semitone, is used.
- 2) the horns' timbre is not as bright as the timbre of the Eb clarinets and trumpets.
- 3) clashes in this lower register are less intense.

This zone of intensity, to pursue the analogy, forms the point of interest in the "middle ground".

Each of the zones of intensity belongs to a note-group; the clarinet and trumpets (the primary zone) to the note-group Eb-A and the horn and trombone, to the Bb-C note-group. Significantly, it is the instruments playing in the Eb-A note-group, containing the primary zone of intensity, who sustain their notes until the end of the piece, while the instruments playing in the Bb-C note-group, containing the secondary zone of intensity, finish one bar earlier.

Varèse uses large, sustained chords, usually played by the whole of the wind orchestra, as one of the ways of marking important points in the structure of a work. They are invariably used at the end of major sections and are constructed from either one, or two note-groups. The final chord in the second movement of Octandre is such a chord, which bases its construction on two note-groups; each note-group being structurally significant because of its association with another musical idea elsewhere in the work (see Chapter Three).

Varèse can also create a division in a chord by giving each group of notes within the chord different dynamics, rhythms or articulation. For example, the chord at bar 78 of Intégrales shows a division between brass and woodwind instruments, the natural separation of these two groups by timbre is enhanced by the use of independent dynamics and articulation. On the

third beat of the bar the brass instruments play a sudden piano, followed by a flutter-tongued crescendo, whilst the woodwind play a steady crescendo throughout the chord. This type of chord always covers a very wide range, mostly between four and six octaves, and often finishes with a crescendo, in an abrupt fashion, a half or a quarter of the way through the beat.

PITCH

Varèse never uses the twelve tones of the scale in the usual serial sense; one reason was his intense dislike of "systems", "isms" and "schools", the other is that he fundamentally disagreed with a system in which the octave is arbitrarily split into twelve equal divisions. The problem lay in Pythagoras's basic premise that a scalar system can be built up from a cycle of perfect 5ths. The problem, as Varèse saw it, was that when the cycle is completed the last note is out of tune with the first (the Pythagorean comma), i.e. C-G-D-A-E-B-F#-C#-G#-D#-A#-E#-B# (C).

Varèse would have argued that C is not the same note as B# and that if the cycle is continued, even more new notes are produced. To Varèse's mind the whole system was spurious, simply because the laws that govern its construction have to be manipulated in order to make the system operable.

Because, in the 1920's, Varèse had to use traditional instruments, he obviously had to accept the temperament in which they played. However, he does, on occasion, distinguish between two instruments playing the same note by writing one of the notes as F#, for example, and the other as Gb. More innovative steps were the use of 1/4-tones (trombone D $\frac{1}{2}$ b in Hyperprism bars 69-75), the glissandi in the brass parts and the use of a siren in Hyperprism and Intégrales provided the possibility of microtonal changes of pitch.

One technique commonly used by Varèse in the organisation of pitch, was to construct a chord or a whole passage from an 11-tone note-group and either precede or follow this with a passage where the missing tone from the note-group is very prominent. For example, the chord in bar 126 of Intégrales consists of 11 tones (D being the missing tone) and the passage from bar 131

to bar 143, despite the fact that it comprises two contrasting sections, is then dominated by the note D. In bars 131-134 the D is used as the central note in the clarinet/trumpet melody and then as an important note in the chord in bars 135-143 (a note which is made prominent by the orchestration - the D being played by the oboe and both piccolos). The use of this technique enables Varèse to maintain a sense of continuity in the development of the music by creating a link between, in this case, three sections (bars 126-130, bars 131-134 and bars 135-143) which are otherwise totally dissimilar.

Varèse also used 12-tone groupings, usually to express the unity and completeness of an idea. In *Hyperprism*, for instance, the passage from bar 40-44, which is a complete musical entity, uses all 12 tones. Varèse does not use the 12 tones instantly or haphazardly, but gradually introduces each of the tones until in bar 43 the group is complete. Example 3 shows when each note is first played in the build-up to the complete note-group.

MELODY

After *Offrandes* (1921) Varèse no longer uses melody in the traditional sense, his melodic lines became vehicles for expressing a certain timbre in a soloistic fashion. It is the fact that a certain type of sound is heard more prominently than any other that is important. He does not use pitch in order to create melody, but, rather, the purpose of changes of pitch within the solo is to give shape and form to the timbre. This is achieved because the quality of each note varies as the solo instrument changes from one part of its register to another.

Varèsian melodies fall into one of two categories:

- 1) The first type is a melodic line which is very similar in style to many of Stravinsky's melodies, they are made up from a series of rhythmic variations circling around a small, fixed group of notes. Stravinsky's music had a great influence on Varèse, an influence which is most apparent in Varèse's large orchestral works, *Amérique*

and Arcana, in which there are passages that sound as though they have been closely based on such works as "The Rite of Spring", "Petrouchka" and "The Firebird Suite". I do not think that Varèse adopted this style because of the intrinsic melodic qualities, but because he saw in them the potential to use melody in a way that would be consistent with his own specific ideas about composition. It was the fact that such melodies could be used to represent a sound-cell, a small unit of sound, that was easily recognisable as a self-contained unit and would remain recognisable even when each repetition of the cell was subjected to ever-developing rhythmic variation. Varèse is able to use this type of melody as the basis for further development by creating within the melody an inner conflict, usually between two sustained notes, each of which is trying to establish itself as a pitch centre.

The oboe solo at the beginning of Octandre is, perhaps, the most obvious example of a melody of this type, in which the competing pitch centres are E and D#. This melody is also used as the basis for motivic development, a fact which arises, mainly, because it appears at the beginning of the work. But elements are just as likely to be extracted from any melody (or, indeed, any chord) to provide the basis for the construction of new material. It is a compositional technique similar to Berlioz's "idée fixe", a technique which can be used to create unity in a work.

It is the tone-semitone intervals created by the upper notes of the melody that are chosen by Varèse to form a motive that becomes an extremely important part of the structure of the whole of Octandre. (See Example 4)

- 2) The second type of melody is what might be thought of as a more traditional form of melody and is formed by the gradual unfolding of a series of notes in a more or less symmetrical form. The trombone solo in Hyperprism, from bars 67-69, reveals a descending chromatic scale; the scale is transformed into melody by the octave displacement

of some of the notes. (See Example 5)

The oboe solo at bar 191 of *Intégrales* and the fugue subject in the third movement of *Octandre* (bar 9) use the same technique, but based on a rising chromatic scale. (See Example 6)

More complicated versions of symmetrical groupings of chromatic tones are found in Varèse's works of the 1920's. One such melody is found in the oboe solo at bar 164 of *Intégrales*, where pairs of notes form units which alternate between ascending and descending chromatic steps. (See Example 7)

The one thing that is common between the two types of melody is the importance of the note-group as the basis of the construction of the melody.

ORGANISATION OF RHYTHM

Varèse understood rhythm to operate on several levels, ranging from the juxtaposition of large contrasting sections, which determine the overall structure of the music, down to the division of the crotchet beat. Just as man has arbitrarily partitioned time into ever-decreasing divisions from year to month to day to hour etc. so, music is based on arbitrary divisions ranging from movements through sections and phrases to bars and beats etc.

The purpose of rhythm, as Varèse saw it, is to provide the platform from which music can be launched, it is the life-source of music; you can have music without pitch, but you cannot create music from pitch if there is no rhythm.

'Rhythm is the element in music that gives life to the work and holds it together. It is the element of stability, the generator of form. In my own works, for instance, rhythm derives from the simultaneous interplay of unrelated elements that intervene at calculated, but not regular, time lapses. This corresponds more nearly to the definition of rhythm in physics and philosophy as a "succession of alternate and opposite or correlative states."⁶

Varèse's interest in the mathematical relationships between sections within a work derive from his ideas about rhythm. For, just as the quaver is related to the semiquaver, so Varèse wanted the larger divisions of a piece of music to have similarly direct proportional relationships. A graphic representation of the hierarchy of different levels of rhythmic activity is shown in Example 8.

This idea of mathematical symmetry producing stable structures was a way of thinking that Varèse had grown up with, that developed from seeds of thoughts implanted in his childhood.

'As a child, I was tremendously impressed by the qualities and character of the granite in Burgundy, where I often visited my grandfather. There were two kinds of granite there, one grey, the other streaked with pink and yellow. Then there was the old Romanesque architecture in that part of France: I used to play in one of the oldest French churches - in Tournus - one that was started in the sixth century and built in the purest Romanesque style. And I used to watch the old stone cutters, marveling at the precision with which they worked. They didn't use cement, and every stone had to fit and balance with every other. So I was always in touch with things of stone and with the kind of pure structural architecture - without frills or unnecessary decoration. All of this became an integral part of my thinking at a very early stage.'

'In 1905, when I composed "Rhapsody Romaine", I was thinking of Romanesque architecture, not Rome! I wanted to find a way to project in music the concept of calculated or controlled gravitation, how one element pushing on the other stabilises the total structure, thus using the material elements at the same time in opposition to and in support of one another. I think I would characterise my early music as granitic!'⁷

It was this "granitic" style of writing that led Varèse to develop rhythm as a "generator of form" i.e. once the smallest unit of rhythm is defined, relationships inherent in that unit can be expanded to create new and larger units. This process Varèse described as "crystallisation", because he was struck by the similarity between the way he thought about the growth of structure in music and the natural laws of chemistry that operate in the process of crystallisation. Although the following quote dates from 1959 the idea contained within it accurately explain the process of a technique that was used by Varèse in the 1920's.

'Conceiving my musical form as a resultant - the result of a process - I was struck by what seemed to me an analogy between the formation

of my composition and the phenomenon of crystallisation. Let me quote the crystallographic description given me by Nathaniel Arbiter, Professor of Mineralogy at Columbia University:

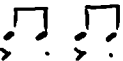
"The crystal is characterised by both a definite external form and a definite internal structure. The internal structure is based on the unit of a crystal which is the smallest grouping of the atoms that has the order and composition of the substance. The extension of the unit space forms the whole crystal. But in spite of the relatively limited variety of internal structures, the external forms of crystals are limitless."

Then Mr. Arbiter added in his own words:

"Crystal form itself is a resultant (the very word I have always used in reference to musical form) rather than a primary attribute. Crystal form is the consequence of the interaction of attractive and repulsive forces and the ordered packing of the atom."

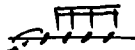
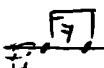
This I believe, suggests, better than any explanation I could give, the way my works are formed. There is an idea, the basis of an internal structure, expanded and split into different shapes or groups of sound constantly changing in shape, direction and speed, attracted and repulsed by various forces. The form of my work is the consequence of this interaction. Possible musical forms are as limitless as the exterior forms of crystals.'g

Rhythm is also an "element of stability", an element that stabilises a piece by creating unity, a means of binding together the disparate units within a work. In Varèse's works of the 1920's it is usual for the wind instruments to express the detailed workings of the various conflicts within the work and, generally, to provide the immediate interest in the music, but it is the percussion, playing independent material that develops and progresses over a longer time span, forming the larger building blocks that bind all the sound-particles of the wind orchestra together.

Small rhythmic figures that are repeated at various points during a work also contribute to the unity of the whole, this function of rhythm is, again, more usually fulfilled by the percussion instruments. For instance, in *Hyperprism* the  rhythm that is initially heard in bar 4 (Indian drum) is also played, in a variety of forms, at bar 7 (Indian drum), bar 9 (sleigh bells), bar 12 (Chinese blocks and sleigh bells), bar 20 (sleigh bells), bar 25 (sleigh bells), bar 28 (anvil), bars 29 and 30 (sleigh bells) and bar 66 (Indian drum).

The "simultaneous interplay of unrelated elements" is expressed in the opening section of *Intégrales*; the unrelated elements being the Eb clarinet pedal point, high woodwind chord and trombone chord. Throughout the section bars 1-25 these elements compete against each other and the entry of each of these sound masses produces the "calculated, but not regular, time lapses."

Rhythm gives shape to timbre by varying the intensity of rhythmic movement, just as melody shapes timbre by varying pitch. Most of Varèse's rhythmic phrases oscillate between moments of extreme activity and moments of relative stillness. Generally, Varèse's rhythms are complex sequences of a highly syncopated nature and the syncopation is usually enhanced by the liberal use of accents. The piccolo solo at the opening of the second movement of *Octandre* contains most of the elements found in a single-pitched solo rhythmic line:

- 1) The oscillation between carefully balanced units of activity and repose.
- 2) Very few accented notes that coincide with the beginning of the beat.
- 3) The use of articulation (in this case, staccato and accent) to give shape to the rhythm.
- 4) Glissandi are used, not only, to relieve the monotony of a single pitch, but also, to give rhythmic impetus to the notes they anticipate.
- 5) Certain elements reappear, sometimes slightly varied to give unity to the whole phrase. i.e.  and 

Rhythmically Varèse is at his most inventive when the independent rhythms, played by a group of instruments, form a very complex aggregate rhythm - a new rhythm which results from the interplay of the individual instrumental lines. Bar 222 in *Intégrales* and bars 41-42 in *Hyperprism* are particularly good examples of this technique. Example 9a shows the four rhythmic lines contained in bar 222 of *Intégrales* and Example 9b the aggregate rhythm

broken-down into its triplet and duplet-based species.

The power of Varèse's rhythmic sense is quite extraordinary, not only, because of the inventiveness of his rhythms, but also, because of the endless variety of rhythmic figures he produces. For example, in *Hyperprism*, *Octandre* and *Intégrales*, in total, contain 487 bars of music, within which Varèse produces over 230 different ways of subdividing the crotchet-beat into rhythmic figures. The fact that many of the rhythms only appear in one of the works makes this statistic even more surprising. To show one of the ways in which he creates this variety I have taken the fifteen basic crotchet-based rhythms that Varèse uses in *Hyperprism*, *Octandre* and *Intégrales* and shown, in the vertical columns of Example 10, the subtle variations to which the basic rhythms are subjected. This is not a complete list of all the rhythmic figures because, for simplicity's sake, I have chosen only those rhythms that are based on the quaver and semiquaver divisions of the crotchet-beat.

INSTRUMENTATION

Since the early years of the twentieth century Varèse had dreamed of using instruments that would free him from the tempered scale. The Futurists had a limited influence on Varèse in this respect; in March 1916, in his first interview for the *New York Telegraph*, he said:

'Our musical alphabet must be enriched. We also need new instruments very badly. The Futurists (Marinetti and his noise-artists) have made a serious mistake in this respect. Instruments after all must only be temporary means of expression, Musicians should take up this question in deep earnest with the help of machinery specialists, I have always felt the need of new mediums of expression in my own work. I refuse to submit myself only to sounds that have already been heard. What I am looking for are new technical mediums which can lend themselves to every expression of thought and can keep up with thought.'⁹

Varèse was greatly influenced by the ideas of Busoni, particularly those ideas that dealt with alternatives to the tempered scale and the use of new instruments. In Busoni's book "*Sketch of a New Aesthetic of Music*"

he said:

'I am more or less convinced that in the authentic new music machines will be necessary, and that they will play an important role. Perhaps even industry will have its role to play in the progress and transformation of aesthetics.'¹⁰

What is so fascinating about Varèse's works of the 1920's is the fact that, although he had been thinking about new instruments and new ways of composing for many years, he was forced to write for instruments that were essentially the same as they were eighty years earlier. In some ways this fact works to our advantage because it forced Varèse to write in a concise and disciplined style, which makes it easier to discover the way that his mind was working.

Varèse's instrumentation is a reflection of his thinking on the nature of the basic parameters of music, the most important being timbre and rhythm. He places great emphasis on the use of percussion instruments, not only, because of his views on the purpose of rhythm in the structure of music, but also, because they allow him to escape from, what he saw as, the limitations of the tempered scale. He was a skilled writer for the percussion instruments; when *Hyperprism* was performed in London in 1924, one of the percussionists who played in the B.B.C. broadcast of the work said that 'the piece was full of the greatest interest to a percussion player and was written by a man who possessed an extraordinary knowledge of the resources of that department.'¹¹

Within the percussion section Varèse exploited the differences between various types of percussion instrument, perhaps contrasting sustaining instruments, like the tam-tam, cymbals and crash cymbal with the purely percussive instruments such as snare drum, tenor drum and Chinese blocks. He also used instruments that would give him the equivalent to a curve of sound, sound which gives the impression of moving through space as well as time. The string drum and the siren come into this category.

Like Stravinsky, Varèse helped to reduce the importance of the stringed in

instruments in the orchestra. Indeed, in the works discussed here, the only stringed instrument to be used is the double-bass in Octandre. Stravinsky favoured wind instruments because of their rhythmic impact, whilst Varèse uses wind instruments because of their clear, pure tone, the great variety of timbre each instrument is capable of producing and because it is just as possible to make a group of wind instruments blend as it is to make them contrast. Also, their sound is likely to be purer, because wind players generally use less vibrato than string players and, finally, the articulation, both at the beginnings and endings of notes, is more incisive. All these qualities make wind instruments ideal for the production of cells of sound that can be manipulated in a precise and intricate fashion, rather like the machine Varèse dreamed of.

Just as there was a contrast between the sustaining and non-sustaining percussion instruments, there is a similar division in the wind orchestra between the brass and woodwind instruments. This allows Varèse the choice of many combinations of orchestral colour, combinations which are capable of producing varying degrees of contrast ranging from the extreme contrast of percussion against wind, to the more subtle contrast of brass against woodwind, or sustaining percussion against non-sustaining percussion.

All the elements, thus far discussed, are essential in the repertoire of Varèse's compositional technique, even the smallest musical cells are functional. Everything that Varèse wrote only exists because he believed they had a specific role to play in the structure of the music; nothing is anecdotal or decorative. My analysis of the three chamber works from the 1920's, therefore, places great emphasis on explaining the purpose and role of each element within the work concerned. I hope that by identifying the elements and showing how they are put together the reader will ultimately be able to listen to the works with greater understanding and appreciation.

NOTES: CHAPTER ONE

1. Karl Wörner 'Stockhausen, Life and Work.' London, Faber & Faber, 1973 p.139.
2. Aaron Copland 'The New Music 1900-1960.' London, MacDonald 1968 p.41.
3. From a lecture given by Varèse at Mary Austin House, Santa Fe, 1936 'New Instruments and New Music.' quoted in 'Contemporary Composers on Contemporary Music.' Edited by E.Schwartz & B.Childs, New York Holt, Rhinehart & Winston, 1967. p.197.
4. Arnold Schoenberg 'Fundamentals of Musical Composition.' London Faber & Faber 1967 p.16
5. From a lecture given by Varèse at Mary Austin House, Santa fe, 1936 'New Instruments and New Music.' quoted in Schwartz and Childs, op. cit., p.197
6. From a lecture given by Varèse at Princeton University, 1959 'Rhythm, Form and Content.' quoted in Schwartz and Childs op.cit., p.202.
7. Gunter Schuller 'Conversation with Varèse.' Perspectives of New Music Spring/Summer 1965 p.34.
8. From a lecture given by Varèse at Princeton University 1959 'Rhythm Form and Content.' quoted in Schwartz and Childs op.cit., p.203.
9. New York Telegraph march 1916, quoted in Louise Varèse 'Edgard Varèse, a Looking-Glass Diary. Vol.I: 1883-1928.' London, Eulenburg Books 1973, p.123.
10. Quoted in F.Oulette 'Edgard Varèse, a musical biography.' London, Calder & Boyers 1966 p.24.
11. Quoted in Louise Varèse op.cit. p.219.

PART II

ANALYSIS

CHAPTER TWO

HYPERPRIISM (1922-1923)

The title "Hyperprism", like all Varèse's titles, has no specific meaning, but it does encapsulate something of the essence of a scientific phenomenon expressed in music. The function of a prism is to scatter light into its component parts, thus, in Hyperprism, one can imagine sound itself being split into fragments that interact as the music develops. All Varèse said about the title is that it 'has a geometrical connotation and implies a fourth dimensional significance.' - the fourth dimensional significance being sound projection.

Hyperprism was written in the winter of 1922/23 after a visit to Europe, that included a meeting with Busoni, and was performed on 4th March 1923 at an International Composers Guild concert held in the Klaw Theatre, New York. It provoked a violent response from the critics as well as from some of the audience. The following is typical of the reaction of the majority of the critics:

'.....it remained to Edgard Varèse (more power to him) to shake the calm of a Sabbath night, to cause peaceful lovers of music to scream in agony, to arouse angry emotions, and tempt men to retire to the back of the theatre and perform tympani concertos on each other's faces.The name of Edgard Varèse will go down in musical history as the man who started something.'¹

However, some people saw the true significance of Hyperprism and understood what Varèse was trying to achieve. After subsequent performances in Philadelphia and Carnegie Hall, under Stokowski, Paul Rosenfeld wrote 'Varèse undoubtedly has done as much with the aural sensations of contemporary nature as Picasso with the purely visual ones.'² Hyperprism was outstanding in its originality and marks a turning point in the development of twentieth century music. Its originality was understood by some, such as Lawrence Gilman, who wrote in the New York Tribune, 'While listening to the "Five Pieces for Orchestra" by Schoenberg, one recalled Wagner; Casella's "Alta Note" reminded me of Schoenberg; but while listening to

"Hyperprism", one thought only of Varèse.³

Hyperprism can, in many ways, be seen as Varèse's first work that quite clearly expresses characteristics which are associated with his fully mature style. Among these characteristics are:

- 1) Prominent use of percussion instruments.
- 2) Absence of traditional melodic writing.
- 3) A style of instrumental writing which is closer to electronic techniques than traditional orchestration.

Many of these characteristics were present, at least in embryonic form, in *Offrandes*, but the more traditional packaging of *Offrandes* tended to hide the innovative elements within the work. Conversely, *Hyperprism*'s immediate impact is 'modernism', in its harshest and most unrelenting form and the shock of this impact obscures those elements which do owe something to Varèse's earlier music.

In *Hyperprism* the basic structure, for instance, consists of blocks of sound; these blocks, for the most part, flow smoothly from one to another, but there are occasions where they are juxtaposed in quite dramatic ways (e.g. wind against percussion between bars 46-55). This is a technique which Varèse consistently used, even in his earliest works; it was a technique which so typified his early style that he described his music written before 1920 as 'architectonic' or 'granitic'. In *Hyperprism* Varèse combines this well-tried technique with an interest which held a particular attraction for him in the 1920's and 30's; that is the use of internal metrical relationships within the structure of a piece of music.

Varèse's 'granitic' style of writing also influences the choice of instruments that make up the orchestral forces, for, the two major groupings within the orchestra (woodwind instruments and percussion) form two 'blocks' and the way these blocks are manipulated make them vital ingredients in the balance of the whole structure. In fact, the conflict between percussion and wind instruments is one of the most important elements in

Hyperprism's construction because it, not only, balances, but also, helps to unify all the disparate elements of the music. The flux between various states of wind or percussion dominance creates a rhythm and, therefore, brings life and movement to the music. The wind and percussion work with and against each other in various ways:

- 1) wind dominant and percussion accompanying (but independent).
- 2) wind dominant and percussion accompanying in unison.
- 3) wind playing on its own (and, therefore, totally dominant).
- 4) wind and percussion acting in unison (this usually means, however, that the wind instruments are dominant).
- 5) wind and percussion being equally important but fulfilling independent musical functions.

The largest scale on which rhythm operates in Hyperprism is the three more or less equal sections of the structure which comprise bars 1-30, 31-59 and 60-90. Within each of these three basic sections there are three subsections. The juxtaposition of these sections creates a rhythm by providing a "succession of alternate and opposite or correlative states". The beginning of each of the subsections is always indicated by a change in tempo. This system of continuous subdivision of constructional units could result in a four-square end-product in which all the building blocks of the music could be all too easily perceived. But Varèse avoids an overstatement of the methods of construction by superimposing up on this clear and simple outline a more intricate weave of contrasting musical ideas (or units), a rhythm of contrast between wind and percussion overlapped and interlaced with distinctive elements which go to make up Varèse's individual repertoire of sounds. Most prominent amongst these elements are:

- 1) solo "melody" with accompanying harmonies.
- 2) shifting harmonies (polyphony).
- 3) solo instrumental "melodies".
- 4) large, static chords.

5) unaccompanied percussion passages.

6) pedal points.

All of them built into a complex and colourful tapestry of sound.

For the most part, the wind and percussion sections are constructed with independent material and aurally the effect is of two different instrumental groups pursuing their own lines of musical development.

SECTION 1: BARS 1-30

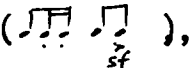
BARS 1-12

Varèse's technique of starting a piece with a simple idea - "the basis of an internal structure" - and expanding it, making it grow and move forward under the momentum generated by its own internal conflicts, which in turn are created as a result of the music's own development, is clearly demonstrated in the opening passage of Hyperprism.

In the growth of any idea there have to be some elements which are consistently recognisable throughout the period of development, otherwise we do not sense so much a gradual development, as a sudden change; effectively a new idea. Varèse achieves gradual development in bars 1-12 of Hyperprism by maintaining familiar timbres (horns and trombones), familiar rhythms ($\downarrow \downarrow \downarrow$), glissandi, and limited and easily recognisable pitch centres (D and C#). He also reinforces the unity in this period of growth by the use and re-use of certain rhythmic motives in the percussion parts.

Varèse starts Hyperprism with a very loud, non-pitched sound (cymbals), very quickly followed by further entries of percussion instruments. These three entries (cymbals, tam-tam and bass drum) form the beginning of a distinct rhythmic figure (see example 1). This is taken a step further by the use of the drum roll on the first beat of the second bar, which then leads into the first true rhythmic figure (bar 2, bass drum). The triplet crotchets within this idea have an important role in the future development of this opening section. The bass drum roll, meanwhile, has initiated the string drum sound, which, together with the rhythmic figure of the bass drum, provides enough impetus to take the music onto the next stage of development; the introduction of pitched sound, which occurs at the beginning of bar 3 with the entry of the tenor trombone C#.

Varèse writes the entry of the tenor trombone off the beat, this is because an on the beat entry would create a sense of stability within

the note, whereas an off beat entry provides enough tension to maintain the momentum necessary for continual growth. It is worth noting that, just as the bass drum roll in bar 2 heralded the first distinct rhythmic pattern, so it also occurs immediately before the introduction of the first pitched-sound. The second drum roll and the introduction of pitched-sound combine to effect the entry of more percussion instruments (the two rattles) which, in turn, leads to further rhythmic development on the bass drum in the second half of bar 3. This rhythmic idea (), particularly the sforzando accent, triggers the next important stage of development; change in pitch, which is portrayed by the use of glissand; in the tenor trombone. (The glissando itself also provides the first stage in the development towards distinct changes of pitch.)

Further rhythmic development in bar 4 (Indian drum) results in the introduction of clear rhythmic movement in a pitched instrument and this, in turn, leads to a change in timbre; for, at the end of bar 4, the C# is transferred from the tenor trombone to the first horn. The crescendo on the horn leads to another change of timbre, and the C# returns to the tenor trombone, which plays another glissando, this time descending and extended to an augmented fourth. This return to the original timbre, coupled with the effect of a more substantial glissando results in a yet more distinctive rhythmic figure (which, incidently, provides the first moment of silence in the pitched parts). The accents used in this particular figure indicate its importance in the growth of the music. In fact, it is this rhythmic figure which causes the generation of the first change of pitch (entry of the bass trombone pedal D) and by creating conflict between two pitched notes (D- C#; major 7th) Varèse provides the necessary increase in tension which can be used as a basis for further growth.

The introduction of the pedal point, itself, creates a change of timbre as the C# is again transferred to the horn but this change is not a repeat of the previous change of timbre, for this time the first horn

is accompanied, or rather amplified, by horns 2 and 3; all three instruments playing the same C#. The horns' C# is really an extension of the horn C# at bars 4 and 5 and as such provides for the listener, by the use of repetition, a point of recognition. However, Varèse changes the repeat sufficiently, by the use of imaginative orchestration, to convey a feeling of continuing development. Exact repetition at this point would have produced a lack of forward movement, a sense of inertia.

From the second beat of bar 7 Varèse, uses material that is derived from bars 4-6. The horn glissando to C# is the same as the trombone glissando in bar 4, but the held C# is prolonged and the triplet crotchet rhythm, from the second beat of bar 4, is played by the horns and developed (note here, that there is, not only, a change of timbre to give the sensation of growth, but also, for the first time, the contrasting timbre (horns) play a distinct and independent rhythm). This aids the sensation of an acceleration of growth and progression. Varèse then enhances this sensation by bringing forward the second entry of the bass trombone pedal D, occurring 5 beats after the B-C# glissando instead of the $7\frac{1}{2}$ beats delay after the first B-C# glissando. Like the pedal D, the percussion parts in bar 8 (except for details of dynamic and articulation, an exact repeat of the percussion parts at bar 6) are also brought forward, this time occurring 3 beats after the B-C# glissando instead of the 8-beat gap in bars 4-5. At the end of bar 8 the tenor trombone part is taken from bar 5, but developed and extended (see example 2). The way in which the horn takes over from the tenor trombone in bar 9 is managed in the same way as in bar 6, but see how the overlap (when horn and trombone are playing together) is greatly lengthened.

After a gradual decline in the prominence of the percussion parts, they once more take an active role in the development of the piece, for the change to $\frac{6}{8}$ time in bars 10 and 11, where the percussion are very active, gives great impetus to the music. The wind parts in bars 10 and 11 are notated in such a way that they effectively are still in $\frac{4}{4}$, it is only

the percussion which actually play in a true $\frac{6}{8}$ rhythm. The three crotchets of the 1st horn in bar 11 are identical to the triplet crotchet rhythm found in bar 2 (bass drum), bar 4 (tenor trombone) and bar 8 (2nd and 3rd horns). The juxtaposition of the pedal D in the bass trombone also means that the wind parts in bar 11 are a repetition of the first two beats of bar 8, but with subtle timbral and dynamic changes.

At this stage (bar 11) the horns have shared all the elements of the trombone C# (pitched note and distinct rhythmic patterns) except glissando. So it is fitting that, in the final bar of this section, the horn should play an ascending glissando up to the C#. It is as though the horn has now completely taken the initiative from the trombone, in other words, that the horn has assimilated all the elements of identity previously articulated in the tenor trombone part. This process has been accomplished in four stages. The first two stages occurred at bars 4-5 and bar 6. At bars 4 and 5 the C# possessed only a horn timbre, in bar 6 the timbre was developed further. The third stage occurred at bar 8 where the horn C# developed a rhythmic identity. Finally in bars 9-12, with the addition of the glissando, the horn displays the three previous stages of development in one unit; bars 9 and 10, timbre; bar 11, rhythm; and bar 12, glissando (the beginning of distinct changes of pitch).

BARS 13-19

In the section bars 13-19 there are four sound masses played by the wind instruments. They are defined by individual rhythmic, timbral and pitch characteristics; their hierarchy is defined by the use of dynamics and, to a lesser extent, by rhythm. The four sound masses are played by:

- 1) Flute and clarinet - playing C and C#.
- 2) Horns - playing Bb, F# and D.
- 3) Trumpets - playing B and Eb.
- 4) Trombones - playing E and F.

The notes of all four sound masses result in the formation of the note group Bb-F#.

One of the qualities of a dissonant interval is that the two notes seem to be bound as a single sound, whereas the notes of a more consonant interval, with the possible exception of the perfect 5th and the octave, seem to retain their independence. This is, I believe, one of the reasons why Varèse so often uses major 7th's, minor 9th's and minor 2nd's, particularly in the representation of sound masses. This particular property of dissonant intervals is especially useful when attempting to make two instruments of differing timbre sound like a single unit. Thus, we find in this section Varèse using a major 7th for the flute/clarinet sound mass, whilst the sound masses which comprise instruments of identical timbre use more consonant intervals. In this particular instance the four sound masses are easily distinguishable by the timing of their entries. Although the horns' entries are slightly staggered they still clearly belong to the same sound mass.

Bars 13-16 see the meeting of the four sound masses, three, of which, partially merge, in fact at bar 16 the flute/clarinet, horns' and trombones' sound masses are almost indistinguishable, especially the flute/clarinet and horns which are close to each other in pitch. Only the trumpets' sound mass remains independent and prominent, this is because of its dynamic and rhythm. The coalition of the sound masses remains in a liquid state, for, at bar 17 the trombones' sound mass becomes solitary, because it is the only sound mass whose instruments are not flutter-tonguing. It is quite natural that the trombone sound mass should be the first to separate itself, because there is an enormous distance between the pitch areas of the sound masses of the flute/clarinet/horns' and the trombones' sound mass.

The trombones' place in the 'threesome' is taken by the trumpets. At first it is the flute/clarinet and trumpets' sound masses who merge (this is indicated by the fact that they start flutter-tonguing at the beginning of the second beat of the bar). The horns at this point are beginning to join the flute/clarinet and trumpets sound mass, for they, too, rearticulate

their chord on the second beat of the bar, but do not become fully united with the other two sound masses until half a beat later when they also start flutter-tonguing. The unity of these three sound masses is confirmed by the use of identical dynamic markings, i.e. *p molto* \longleftarrow *sfff*.

The interaction of these three sound masses and the effect this action has on each of them is described by the use of dynamics, rhythm and timbre. For instance, in bar 17 the nature of the flute/clarinet sound mass is changed by the alteration of timbre when the two instruments exchange notes; thus the sound mass retains its identity because it is still defined by the use of the same two notes but the change of timbre shows that 'transmutation', a change in character, has occurred. The disintegration of this newly-united sound mass is activated by the *ffff* entry of the percussion. The use of *sfff* at the end of the wind chord is a typical device used by Varèse to describe the sudden and violent demise of a sound mass. This collapse is immediately followed by the restoration of the flute/clarinet sound mass to its original form. Because the trombones' sound mass was independent of the flute/clarinet, horns' and trumpets' sound mass at bar 17, it did not finish in the same way, however, it was influenced and effected by it. This influence is shown by the use of the crescendo to fortissimo at roughly the same time as the *sf p* \longleftarrow *sfff* of the other sound mass. This independence explains why the trombones' sound mass ends very differently (and a beat and a half later) than the other sound mass. By the end of bar 18 the flute/clarinet sound mass also ceases to exist in its original form, leaving the flute alone at bar 19 sustaining the same note it was playing before the interaction of these found sound masses.

At the beginning of this passage all the sustaining percussion instruments act as accompanists, as they follow the rhythm dictated by the wind instruments. During the height of the confrontation between the four sound masses the percussion are silent, but restart at the end of bar 17 with independent rhythmic material.

BARS 20-30

At bar 19 the nature of the percussion writing changes, it is now much more subdued and finds a balance with the flute solo, alternating moments of intricate activity with moments of stillness. The flute solo oscillates in a similar way, producing its moments of intense melodic movement during the percussion's periods of stillness. The flute solo is constructed in such a way that it uses an 11-tone note-group, which omits the note D. As the melody progresses, the long, sustained notes get shorter; the opening C is $10\frac{1}{2}$ beats long, the F# (bars 20-22) is 7 beats long and Bb (bars 22-23) is $3\frac{1}{2}$ beats long. The snare drum solo in bar 22 (based on the snare drum rhythm in bar 11) disrupts the flute's sustained F# and causes the increased melodic movement in bars 22 and 23. The flute's final note, Eb, is joined by the trumpet Eb; the trumpet then sustains the Eb while the flute shifts to E \flat to complete the Eb-C# note-group at the moment the music returns to the tempo of the opening.










In bars 24-30 we are given an early example of Varèse's technique of dissecting an interval with another note or, in this case, another interval. This is a technique which is often used later in his career, most notably in *Deserts* (1954). At bars 24 and 25 an Eb/E pedal point is played by the flute and trumpet. This interval is split at bar 28 by the A/Bb of flute, clarinet and trumpets. The significance of the A and Bb is that these two notes mark the exact centre of the minor 9th, Eb/E. Although this event occurs over a period of seven bars the effect is still clear because of the lack of any other pitched sounds, indeed, the contrasting percussion writing actually heightens the effect, because it isolates the two wind pedal points.

This is the first section that is overwhelmingly dominated by the percussion and its domination is centred around the snare drum rhythm in bar 28, which has, thus far, been one of the most prominent percussion motives (originating in bar 11). This rhythm stands to the fore in bar 26, the first bar in this section that the percussion play alone. It is followed

up, in bar 28, by the anvil before the wind instruments return in bar 28.

This section also contains rhythmic motives that have been used earlier

in the work:

bar 24		from bar	8
		from bar	6
bar 25		from bar	12
		from bars	4, 7, 9, 12 & 20
bar 26		from bar	4
bar 27		from bar	4
		from bars	11, 22 & 26
bar 28		from bar	2
bar 29		from bars	4, 7, 9, 12, 20 & 25

The woodwind rejoin, in bar 28, with a Bb-A major 7th, which is an inversion of the minor 9th that started this passage. The Bb-A interval gives a good example of the attention Varèse gives to the details of orchestration, in order to get exactly the effect he wants. In bar 28 the Bb and the A start the pedal point with a balanced dynamic, but as the crescendo progresses the Bb gradually becomes more prominent because of the addition of the muted trumpet timbre. In bar 30 the Bb becomes even more prominent as the 1st trumpet, unmuted, also joins the note. Not only has the Bb become the more dominant pitch, but the timbre of the note has gradually evolved from a purely clarinet-sound to a clarinet/trumpet sound and, finally, to a trumpet-sound with an element of clarinet timbre.

SECTION 2: BARS 31-60

BARS 31-39

The section from bar 31-39 consists of two phrases of horn "melody" which split the passage into two equal halves, each lasting thirteen beats; the first half being bars 31-34 and the second, bars 35-39.

From bar 31 to bar 38 two chords are used as an accompaniment to the melody played by the 1st horn. The first chord is used from bar 31 to the middle of bar 33 and the second chord from the middle of bar 33 to bar 34, then, in bars 35 and 36 the first chord is used again. As example 3 shows, the notes of the first chord (including the melody) form the note-group E-Ab and the second chord uses the note-group A-Eb. This shows that, not only, does Varèse use all twelve tones in this section, but more importantly, that he uses them in a particular kind of way, and that this particular method is not just a mathematically attractive, but otherwise arbitrary way, but is used to fulfill a purely musical function; namely, to emphasise the separateness of the two chords and to enhance the overall feeling of strength and vigour.

The distinction between the two note-groups is made clearer by the way two groups of percussion instruments are used to accompany the brass chords. All the percussion instruments that are used in this section play in the same rhythm as the brass instruments, but when the first brass chord is played (bars 31-32 and 35) the Indian drum, bass drum, tambourine and cymbals play and when the second brass chord is played (bars 33-34 and 36-38) the snare drum, crash cymbal, tam-tam and slap stick play.

The section is completed with all three horns, in unison, revolving around the notes Eb, Gb and G, producing a figure which is based on the solo horn up-beat semiquavers in bar 34.

BARS 40-44

The section at bars 40-44 represents a single sound mass moving in three-dimensional space, and moving in such a way as to give the impression that it is changing shape. I will explain this with a visual analogy. Certain geometric shapes appear to change when turned on their own axes; the triangle in example 4, for instance, appears to be a different shape with each movement, but we know it is the same object and that its location does not change; Varèse performs the same illusion in sound. He describes this phenomenon by constantly and rapidly changing the arrangement of the notes written within the sound mass, while, at the same time, creating an impression of very slow overall movement. (In much the same way as a traditional composer, Bruckner for example, wrote music in which the individual parts move very rapidly but the overall impression of movement is slow because of the slow harmonic rate.)

There are two ways in which Varèse manages to sustain this paradox. Firstly, the outer parts move relatively slowly and give an impression of stability (particularly the trombone part). Secondly, he uses one note, E, as a pedal point. The E starts the section, at bar 40, where it is pitched against the horn Eb (an inversion of the Eb/E clash at bar 24). Having survived this clash the E is now established as a strong note and does, in fact, form the backbone of this section. It is held through almost the whole of bar 41 by the trumpet, is passed to the clarinet at the beginning of bar 42 and then passed, an octave lower, to the tenor trombone on the third beat of bar 42. It is the stillness of this note which marks it out from the hectic nature of the rest of the music.

The impression of the sound mass changing shape is created by the complex interaction of the inner parts. In the space of six beats the movement of these parts results in eighteen changes of chord, indicated in Example 5 by the black notes; the white notes indicate a note held on from the previous chord. The outline of the 'musical shape' also changes; the

chord on the last beat of bar 41 has a range of two octaves and a semi-tone, this range shrinks to the equivalent of a major 9th and expands again to a range of two octaves and a major 3rd at the beginning of bar 43. (See Example 5)

BARS 45-59

The section from bar 45-59 shows how note-groups can be used to define sound masses. The horn/trombone sound mass, for instance, is easily identifiable by the rhythmic pattern that those instruments share, but this sound mass also has exclusive use of all tones from C#-Eb. The trumpets form the second sound mass, using all tones from F-G#; this supposition is supported by the individual nature of the trumpets' parts and the fact that they share identical rhythms. The third sound mass, piccolo/clarinet/horns 2 and 3, although not unified by rhythm, can be classified as a single sound mass because these instruments use all the notes from A to C. It is possible to argue that the horns' A belongs to the trumpets' sound mass (F to G#), but the strong association of the A/Bb combination from bars 28-30 and the fact that when these sound masses are broken up by the percussion (bars 49-59) the horns' A appears with the clarinet Bb (bar 51), leads me to conclude that the A is part of the flute/clarinet sound mass.

The section begins with an exposition of the three wind sound masses:

1) piccolo/clarinet/horns 2 and 3, 2) trumpets, 3) trombones/horn 1.

Although these sound masses are independent they do act as a group, and as a group appear to have an element of unity particularly when directly opposed by the percussion. The unity of the wind parts is enhanced by the allocation of characteristic tempi to the two opposing "orchestras"; the wind group - "atempo mosso" and the percussion - "vif". After the initial exposition (bars 45-48) the music is entirely concerned with the violent juxtaposition of the wind and the percussion and their respective tempi. At the first arrival of the percussion (bar 49) all sound masses, except the trumpets', suddenly end with the typical use of a crescendo

through to a sff which indicates the sudden and violent end of a sound mass.

The trumpets' sound mass is the only one to survive the impact of the percussion, but at bar 50 it, too, finishes with a crescendo ending in a sfff accent. A brief return to a "tempo mosso" marks the reappearance of the piccolo/clarinet/horns 2 and 3 sound mass, but with the piccolo omitted. The omission of the piccolo part is a contributory factor to the further disintegration of the wind sound masses. At bar 52 the percussion returns with a reduced version of its material from bars 49 and 50. At bar 53 and bar 55 the silence of the percussion and the return to a two-beat bar (significant because of its association with the last "a tempo mosso") leads one to expect a return of the clarinet/horns 2 and 3 sound mass. Their subsequent absence only serves to emphasise the disintegration of the wind orchestra, especially as the two-beat bars are now played in the tempo ("vif") associated with the percussion.

At bar 56 all the wind sound masses return in their original form but the order of their entries is changed, neither are they as fluent as they were in bars 45-48. It is now the percussion parts which are disintegrating and the wind orchestra is once again the more prominent. The fortissimo percussion entry in bar 57, with material based on bars 50 and 52, only succeeds in momentarily breaking up the sound masses of the horns, trumpets and trombones. The weakening of the percussion is also illustrated by the fact that the two percussion interjections after bar 56 are played in the "a tempo mosso" speed; the tempo previously used in this section for the wind instruments.

Through bars 58 and 59 all of the parts, wind and percussion, gradually break up. The piccolo/clarinet sound mass holds a static pedal point and all the other wind sound masses are broken into smaller, stammering units; the percussion's driving rhythmic pattern breaks down. Note the manner in which the wind parts finally break up, again, with a crescendo leading to a sudden loud ending.

The conflict between percussion and wind is never finally resolved, both are superceded by the return of the mood of the opening of the work.

SECTION 3: BARS 60-90

BARS 60-68

The mood of the opening of the work returns at bar 60 and is indicated, not only, by the common musical content and atmosphere, but also, by the use of the same tempo indication. In Hyperprism, the term "Moderato" is only used at the beginning of the work and at bar 60.

The 1st horn part corresponds to the tenor trombone C# of the opening, like the tenor trombone, it plays the top note of a brass chord and it plays a glissando, which, incidently uses the same range (a diminished 4th) as the trombone upper glissando in bars 5 and 8. The 2nd horn part provides an accompaniment and support to the 1st horn, whilst the bass trombone plays a low pedal point which corresponds to the low D pedal point it played in bars 1-12 and, like the pedal point in bars 1-12, it is also stated three times. The interval that the bass trombone forms with the 1st horn (a compound minor 9th) is an inversion of the major 7th formed between the bass trombone and the tenor trombone in the opening passage of the work.

In bar 63 the F# is passed from the 1st horn, to the tenor trombone, which then plays a solo melodic line that corresponds to the flute solo at bars 19-23. In the flute solo all the tones except D were played and in the trombone solo all notes except C# are played (D and C# being the notes that made up the major 7th pedal at the beginning of Hyperprism). In the first half of the melody the trombone oscillates between F and F# and plays a glissando which always leads up to the F. Then, from bar 66 to the end of the solo, the trombone plays a melodic line that is based on a chromatically descending sequence of notes.

PERCUSSION: BARS 60-68

The percussion parts in bars 60-68 operate independently of the wind instruments and are, essentially, involved with the development of rhythmic fragments from earlier sections of the work. Bars 60-63, generally, uses rhythms that derive from bars 1-12 (the same section that the brass parts originate from), whilst in bars 64-68 Varèse uses motives from bars 24-30. The recapitulated rhythmic material is, more often than not, developed and expanded by the same instrument that played the original version. Example 6 gives a list of the rhythmic figures that originated from earlier in the work and are recapitulated in bars 60-68.

BARS 69-76

As a contrast to the low sounds in bars 60-68, the next passage is dominated by a high-pitched idea played by the piccolo and clarinet. The change by woodwind to high sounds is matched by the percussion as it changes texture to a Chinese blocks solo with slap stick interjections, both instruments producing high-pitched sound. The Chinese blocks complement the woodwind by answering the piccolo/clarinet demisemiquavers with its own demisemiquaver rhythm in bars 70 and 71. Continuity through these differing sections is maintained by the bass trombone, which resumes the pedal point it played in bars 60-63. Again, the pedal point is played three times and it still refers to the D/C# conflict by playing D $\frac{1}{2}$ b (i.e. neither D nor C#).

The piccolo/clarinet material, not only, recalls the sound mass at bar 13-19, but also the piccolo/clarinet sound mass at bars 47-59. The change of timbre in bars 71-72 (where the piccolo and clarinet take over each other's notes) leads to the introduction of a new figure, played by the piccolo, which adds the notes A to the piccolo note-group, and Eb to the clarinet note-group. The piccolo triplet semiquaver figure then leads, not only into the piccolo/clarinet G/Ab pedal point, but also to the return of a percussion part, which continues the recapitulatory function of the percussion instruments in bars 60-69. The introduction of the

notes G and Ab in the pedal point, completes the note-group for this section. Example 7 shows how the 10-tone note-group has gradually formed during this section.

The abrupt end of the bass trombone part with a sfff, the loudest and most sudden finish of all its pedal points in this section, nudges the piccolo and clarinet into rhythmic articulation. The piccolo/clarinet sound mass, itself, then comes to a sudden close, at the end of bar 76, at the same moment as the percussion. The only instrument to continue over the bar-line is the crash cymbal which entered on the last beat of bar 76, in order to provide a link into the new section.

BARS 77-90

The short percussion interlude, bars 77-84, is played by those instruments that did not play in the section from bar 69-76. Suddenly, in bar 85, the lightness of the percussion passage is shattered by the fortissimo entry of the three horns playing in unison, in much the same style of writing as the horn figure in bars 38-39. In bar 85 the horns emphasise the two notes that form the outer limits of this figure; one note is D, which has not been heard since the trombone solo at bars 63-69, and the other note is C#, which has not been heard since bar 59.

The horn figure settles on a C and progressively horns 1 and 3 stop playing, until only horn 1 is sustaining the C through to the final chord. There then begins a build up of instruments joining the chord until, at the beginning of bar 87, all the wind instruments are playing. The build up of the entries results in the following rhythm:

The final chord is divided into two parts, bars 86-88 and bars 89-90. In the first part, all the tones, except D, C# and G#, are used; the notes that were played by the horns in bars 85-86. In the second part of the chord, at the beginning of bar 89, the piccolo plays a trill (G-Ab), which means that the notes D and C#, which have been significant notes for the structure of the whole work are now the only notes missing from

the chord. Two further things happen when the piccolo trill starts, firstly, the 2nd horn and trombones stop playing (these were the instruments that did not re-articulate the chord at the beginning of bar 89) and, secondly, the percussion (crash cymbal, tam-tam and triangle) start to accompany and assist the crescendo in the final chord. These three percussion instruments can, also, be seen as replacing the three brass instruments that stopped playing in bar 89.

NOTES:CHAPTER TWO

1. Henderson New York Herald quoted in Louise Varèse op.cit., p.193
2. Paul Rosenfeld, quoted in F.Oulette 'Edgard Varèse, a musical biography.'
Calder & Boyers London 1966. p.78
3. L.Gilman New York Tribune Dec.17th.1924 quoted in F.Oulette op.cit.p.78.

CHAPTER THREE

OCTANDRE (1923)

Octandre was written in 1923 and was first performed in New York on 13th January 1924, conducted by E. Robert Schmitz at an I.C.G. concert. Once again Varèse uses a title that is no more than an indication of a scientifically orientated atmosphere. 'The title is obvious:' Varèse said (probably with tongue-in-cheek) 'octandre, octandrious in English means having eight stamens.'¹

Octandre is unusual in that it is written in three separate movements and it has no percussion parts. My own feeling is that Varèse had broken away from tradition with the writing of Hyperprism and he wanted to explore, more thoroughly, what he had discovered. Therefore, he limited himself to a concise instrumental force, just as Schoenberg and Webern limited themselves to writing short pieces when exploring the newly formulated 12-tone system. Octandre uses the smallest grouping of instruments he had ever used, consequently, Octandre is extremely complex in its internal structures, everything is very tightly organised and almost every note has a structural significance.

Like Hyperprism, Octandre is split into three and, also like Hyperprism, the three sections (or movements in the case of Octandre) are roughly equal in length. The symmetry in Octandre is enhanced by the use of an instrumental solo at the beginning of each movement; oboe in the first, piccolo in the second and bassoon in the third. Although each of the movements is individual in character there is a cross fertilisation of certain ideas from one movement to another. The oboe solo at the beginning of the first movement provides many motives and intervals which are used throughout the structure of the whole work. For example, the tone-semitone sequence, the intervals of minor 9th, major 7th and augmented 4th and the D#-Gb note-group.

FIRST MOVEMENT

The first movement of Octandre is constructed from three basic sections:

- 1) bars 1-18, this is split into two sub sections bars 1-9 and bars 10-18.
- 2) bars 19-24.
- 3) bars 24-32.

Using Varèse's metronome markings as the basis for calculation it then transpires that the movement is divided into four, more or less, equal sections which correspond exactly to the structural units stated above.

i.e.	Section 1	Sub-section 1	bars 1- 9	39	secs.
		Sub-section 2	bars 10-18	39	secs.
	Section 2		bars 19-24	27.5	secs.
	Section 3		bars 24-32	34.2	secs.

There is plenty of evidence, not only, in the construction of this movement, but also, in the details of the compositional techniques used, that Varèse used the opening section of the Rite of Spring, certainly as a source of inspiration and perhaps as a structural model. This supposition seems entirely reasonable when one considers that much of Varèse's music is distinctly "Stravinskian" (Amerique, Arcana etc.), it is known that Varèse had a great admiration for Stravinsky's work and, most certainly, would have been well acquainted with his music. A detailed description of the parallels between the opening oboe solo of Octandre and the opening Bassoon solo of the Rite of Spring is contained in the main body of the text. Suffice it to say, for the moment at least, that bars 1-9 of Octandre contain many similarities to the "Introduction" of the Rite of Spring. The flute figure in bar 10 of Octandre could well have been influenced by the florid flute writing at figure 5 in the first section of the Rite of Spring. Finally, and perhaps the most striking structural similarity is the fact that in the first section of Octandre the opening oboe solo returns at the end of the movement transposed up an augmented 4th; in the Rite of Spring the first section is concluded by a return of the opening bassoon solo transposed a semitone down.

SECTION 1: BARS 1-18

SUBSECTION 1: BARS 1-9

The first ten bars of Octandre are dominated by an Oboe solo which is largely unaccompanied. The exposition of this oboe solo contains the elemental material for the rest of the movement, and the development and expansion of the solo makes these ideas more aurally comprehensible. The first three bars of oboe solo are based entirely on the note-group D \sharp -Gb. After its initial statement in bar 1 the note-group is then subjected to two variations, one each in bar 2 and bar 3. The effect of these variations is to imply growth and development from the initial idea. In bar 1 the crescendo/diminuendo on the minim E indicates the beginnings of growth; in bar 2 Varèse sustains this growth by placing a mordent on the D \sharp . In bar 3 the rhythmic impetus is increased as the Gb-F interval, being played as triplet quavers, is repeated in semi-quavers. The E is now lengthened and the D \sharp shortened. In these first three bars the E and D \sharp are notably longer than either the Gb or F and, therefore, create an unsettled pitch centre which oscillates between the two notes. The conflict between E and D \sharp is by now revealed as being another important factor in the growth and development of this opening motive.

This form of melodic variation around a set of notes is reminiscent of Stravinsky's melodic style in his earlier music. The choice of oboe as solo instrument at the beginning of Octandre may well have been directly influenced by the solo played by the bassoon (another double-reed instrument) at the opening of the Rite of Spring. (See Example 1)

There are further examples of characteristics which are common to both pieces, which reinforce my belief that the opening of the Rite of Spring provided some of the inspiration for the composition of the first movement of Octandre. As well as the similarity in the melodic writing, there is also the common use of a descending clarinet accompaniment which in the Rite occurs at bars 4-6 and in Octandre occurs at bars 5-6. Both melodies

have two pitch centres, notes on which the melodies seem to repose; D \sharp and E are the pitch centres of Octandre and C and A in the Rite (first shown in bar 1). Thirdly, the ornamentation of each of the melodies comprises only the ornaments $\overline{\text{f}}$ (mordent) and ^ (acciaccatura). The opening motive contains the seeds of several ideas; firstly, the notes used form a note-group consisting of a descending chromatic figure (Example 2), secondly, the higher notes of the motive, Gb-E-D \sharp , outline an important sequence of intervals, i.e. a tone and a semitone (Example 3), thirdly, the major 7th between the F and E becomes structurally important, both as a melodic interval and as a pedal point interval.

At bar 4 Varèse again uses the idea of a descending chromatic scale, but this time using the note group B-D. Notice that, as in the first motive (bar 1), the second semitone is displaced down an octave. (See Example 4) The octave displacement of the C results in the tone - semitone (D-C-B) line that is outlined in the upper part of this chromatic motive. In bars 1-4 Varèse has, not only, predominantly used descending chromatic figures, but also, he has used only the notes within two separate note-groups, the second of which (B-D) consists of the four semi-tones below the first group (D \sharp -Gb). By using adjacent note-groups Varèse maintains a sense of unity of purpose whilst the development of the music is in progress. Growth is seen to take place on two levels; not only by using descending chromatic notes, but also, descending note-groups.

After the exposition of the first two note-groups Varèse returns to the first two notes of the first note-group (the F \sharp and F \flat triplet crotchets at the end of bar 4). The reappearance of these two notes turns out, in fact, not to be a return to the opening idea, for the Gb is written as F \sharp and the introduction of a "rogue" note (G \sharp acciaccatura) then leads the music to a new pitch area. The long A in bar 5 is the point to which the G \sharp is leading, and introduces a potential pitch centre that will eventually rival the E/D \sharp pitch centre of bars 1-3. As soon as the A is established the clarinet introduces a descending figure, based on the tone-

semitone relationship of the opening motive (See Example 5), which comes to rest on a Bb, thereby creating a major 7th pedal point with the oboe A.

The clarinet Bb at the beginning of bar 6 completes the eleven note-group G#-A; the missing note (Gq), does not appear until the very end of the section (the final quaver of bar 9). One might expect that the setting up of the major 7th pedal point between clarinet and oboe would result in a pitch centre conflict such as dominated the first four bars of the movement. However, the introduction of the double bass E#, in turn, forms a major 7th pedal with the clarinet Bb, thereby effectively releasing the oboe A from its role as a pedal point. The oboe then reintroduces the previous pitch centres (E/D#) and the music then revolves around these three notes in a similar manner to the opening; the D#-E mordent in bars 7 and 8 seems to emphasise the link.

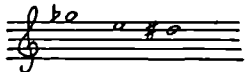
In bars 1-4 the E was the predominant note in the conflict between E and D#, but in bars 6-8 it is the D# which is the stronger of the two notes. The introduction of the A as a potential pitch centre changes the character of the pitch centre conflict, and this conflict is further developed in bars 7 and 8 with the introduction of a G#. At this point there seems to be a double conflict; firstly between the E and D# and secondly, between the A and G#. None of these notes actually succeed in creating a stable pitch centre, but the note-group used establishes some important intervals which are significant to the structure of the first movement, viz. the augmented 4th (A-D#) and the major 7th (A-G#). The major 7th has already, in fact, been established as an important interval (F-E in bars 1-3 and the pedal points in bar 6).

The E/D# and G#/A conflict of bars 6-8 finally breaks down in the middle of bar 8. The change is marked by the reintroduction of the first three notes of bar 1, but enharmonically changed, significantly, I believe, from Gb-F-E to F#-F-E. These three notes provide a bridge into a new

idea; an ever ascending sequence of intervals in the style of a fanfare. This figure is made up of three elements; two chromatic note-groups (F#,F,E) and (C,B,Bb). The final note of the oboe solo emphatically delivers the only tone which has so far been omitted (G4) in order to complete the 12-note group. (See Example 6) This is an event of some significance and one which was clearly deliberately planned by Varèse; for the note G is the highest note played so far, it is also accented within the loudest dynamic so far experienced and it marks a dramatic point in the development of this movement, expressed by the change in orchestral colour that immediately follows.

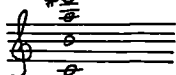
SUBSECTION 2: BARS 10-18

In bar 10 the flute continues and develops the oboe material from bar 9 and just as the oboe used *two note-groups plus the top G*, so the flute in bar 10 uses two note groups plus a G#. The fact that the flute comes to settle on a note (G#, bar 11) which is a semitone higher than the oboe top note is significant, because it shows the growth and development of the oboe idea and provides an overlap between the first subsection (bars 1-9) and the second subsection (bars 10-15) of this movement. The transposition up a semitone is also present in the second of the note-groups used by the flute in bar 10; the similarity in construction of the oboe and flute writing is quite apparent. (See Example 7) In bar 10 the flute, oboe and trumpet expand the material presented by the oboe in bar 9 and develop it into a single sound mass at the beginning of bar 11. The rhythmic movement in the flute part in bar 11 triggers off an opposing sound mass in the form of a major 7th pedal point played by horn and bassoon using the note-group B-C. (This pedal point is a development from the brief and shifting major 7th pedal points that appeared in bar 6). These two sound masses are independent, not only rhythmically, but also, because each sound mass has its own pitch area. This is done because after the initial rhythmic independence, both sound masses basically consist of long held chords; if both sound masses occupied the same pitch area they would merge and become indistinguishable.

In bar 12 rhythmic movement by the trumpet sets off a reaction within its own sound mass as the flute responds by repeating the triplet/duplet semiquaver figure from bar 11. This results in a transmutation of the sound masses after the pause in bar 11. The clarinet and oboe notes drop out and it is as though their place is taken by the horn and bassoon. This is, indeed, what has happened, for the timbral content and the pitch area of the sound mass may have changed, but the structure of the chord remains exactly the same. The trumpet/oboe/clarinet/flute chord on the last beat of bar 11 comprised the notes A, G#, F#, Fb. (See Example 8) The structure of this note-group is derived from the oboe material of bar 1, where the upper notes outlined a descending motive consisting of a tone and a semi-tone. 

The note-group used in Example 8 consists of two overlapping sets of tone and semitone intervals. (See Example 9)

The trumpet/oboe/clarinet/flute sound mass, after transmutation has taken place, contains the notes C, B, A, G# which can be arranged to show that it has exactly the same structure. (See Example 10)

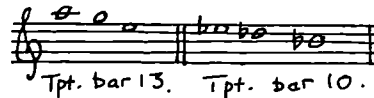
The notes of this second chord are arranged at the end of bar 12 to produce two major 7ths formed by the notes C-B and A-G#. 

As the notes of this chord are evenly spread a sense of balance

and stability prevails. However, at the beginning of bar 13, the timbral changes within the sound mass initiates a new development. Varèse achieves this by rhythmically unifying the B and the A (bassoon/trumpet) and, thereby, changes the content of the chord from two major 7ths to a minor 7th and an augmented 5th. This proves to be a very subtle way of changing the character of a sound mass without even changing the notes that are being played.

As has already been mentioned the sound mass consists of the notes G#, A, B, C and the significance of the structure of the note-group has already been explained. But at the beginning of bar 13 the clarinet plays a single Bb and immediately demolishes the significance of this note-group, because the Bb makes this chord into a complete note-group containing all the semitones between C# and C. All these changes result in the disintegration

of this sound mass into two separate sound masses (flute/horn and bassoon/trumpet). The flute and horn persist in playing a long sustained pedal point articulated only by rhythm and changes in dynamic. Around this pedal point the bassoon and trumpet weave a barely melodic idea derived from the opening notes of the trumpet part in bar 10. It is not only the use of the demi-semiquaver which initially identifies the trumpet and bassoon part with the trumpet solo in bar 10, but also the fact that the notes played by the trumpet in bar 13 form a sequence of tone and minor third; which are the intervals created by the notes which make up the opening of the trumpet solo in bar 10.

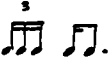


During bars 13 and 14 the horn has been responding to the rhythm played by the flute; but when the horn answers the flute's triplet quavers in bar 14 it changes note to an accented *sf* Eb. As it does so it aligns itself with the trumpet, which also plays the same rhythm. The two instruments form a minor 9th, an interval which creates a bond between the sounds of the two instruments. This, of course, upsets the equilibrium of the last two bars and the music very rapidly forms into a large chord with staggered entries and a crescendo, in all instruments, to a sudden *sfff* end. This type of chord in Varèse's music is always associated with the disintegration of a musical idea. The chord itself has two zones of intensity, one played by the oboe, clarinet and trumpet and the second by trombone, bassoon and horn. The oboe/trumpet/clarinet group is the primary zone of intensity because the instruments playing produce a more strident and penetrating sound than the bassoon/horn/trombone note-group and, therefore, are heard in the foreground of the music, whilst the flute and double bass form the backdrop of the chord. (See Example 11)

The tones used to make up the two zones of intensity form the note-group D-G. Varèse obviously intends there to be a certain amount of integration between the two zones of intensity because the note-groups overlap. (See Example 12) There is also a deeper significance to this structure; the two groups of notes each form a tone-semitone pattern, the same structure

as used for the chords in bars 11 and 12. The static part of the chord obviously consists of eight tones, to these Varèse adds three more by giving the clarinet and oboe preliminary notes; the main function of these is to turn the chord into an 11-tone note-group comprising all the tones between Bb and G#, thereby omitting the note A. The A is deliberately chosen to be the missing tone from this group because it was such an important and prominent note in bars 10-13 when it was announced in fanfare fashion by the trumpet in bar 10. It is only now that we can understand the extent of the importance of the comma just before the A and the accented sff at the beginning of the note (the silence before the sff making the note more prominent.) The trumpet A is an important feature in the structure of the first movement and appears again later in the movement as a significant note.

The bassoon and oboe continue to sustain their notes after all the other instruments have stopped playing. This is, I believe, because the notes they play and the interval those notes form correspond exactly to the two opening notes of the movement. The bassoon then plays, in inverted form, a melodic line based on the flute figure of bar 10. (See Example 13)

In the 1966 edition of Octandre the rhythm of the bassoon part corresponds exactly to the flute figure in bar 10, and makes the link between the two more distinct. In the original 1924 edition, however, the bassoon plays the same notes but with the following rhythm:  , which derives from the rhythm of the flute G# in bars 11-13. This version is less backward looking and continues the development of the music in a more positive fashion. However, both versions are, to some extent, using material already used, and acts as an introduction to the next three bars (16-18) which contain reworkings of motives already heard in the section from bar 10-15, and effectively becomes a kind of recapitulation with which to complete the first section of the movement.

The bassoon settles on a pedal Bb, which is a semitone lower than the note it played in its sound mass (with the horn) in bars 11-12. At the

beginning of bar 16 the horn plays the same note (C) as it played in that same sound mass, but on the second beat of bar 16 sustains a C \sharp and forms a pedal point with the bassoon. The triplet crotchet rhythm is derived from the horn part in bar 13. The use of this rhythm helps us to identify bar 16 as being a remnant of the horn/bassoon sound mass from bars 11-13. The pitches used are no longer the same, the interval formed by the two instruments is no longer the same; but the timbre is the same and the use of similar rhythmic material (triplet crotchets) reinforces the link between the two. The fact that there are no other instruments playing in bar 16 also helps to strengthen the association with the earlier sound mass.

The flute/oboe sound mass in bar 17 quite obviously recalls the bassoon/trumpet figure from bar 13 and, although the timbre of the sound mass has changed, the same pitches are used, but developed by adding a trill to the second note. The trill replaces the flutter-tonguing used by the trumpet. The notes B and A are lengthened, but otherwise the rhythm is identical. The dynamics, although louder at bar 17, maintain the same balance between the two parts, i.e. the lower part is louder than the upper part. The similarity between the two sound masses ends when the flute plays F-E; pitches which are strongly associated with the oboe theme from bar 1. This causes disruption which results in another big chord, which corresponds to the chord in bar 15. The chord consists of two clearly defined elements, one element played by the woodwind instruments and the other played by the brass. The flute/clarinet/oboe chord consists of the note-group Db-Eb, distributed so as to form a chord comprising a major 7th and a minor 2nd. This woodwind chord is answered by a brass chord which also consists of three semitones (A-Cb) also organised so as to form a major 7th and a minor 2nd. The relationship between these two groups of notes is similar to the technique already mentioned in regard to the structure of the chord in bar 12 and bar 15, where the note-group formed two overlapping sets of tone and semitone intervals. (See Example 14)

The brass chord represents an opposing sound mass, and the crescendo in the brass chord denotes its superiority at this point. This causes changes

in the woodwind chord, the changes being most active when the crescendo is at its height. As the brass chord starts to get quieter the woodwind chord begins to restabilise and, although the woodwind are playing different notes, the chord structure is the same as at the beginning of the bar, i.e. major 7th and minor 2nd. However, the restabilisation does not last long, more movement within the chord (clarinet F) and the crescendo to sfff, signals the demise of this sound mass and the end of the first section of this movement. The final chord of the woodwind sound mass is similar in structure to the other two woodwind chords in bar 18, but forms a minor 9th and a major 2nd. The change of chord structure is another method of representing the break up of a sound mass. (See Example 15)

As already mentioned, bars 15-18 represent a type of recapitulation of this first section (bars 1-18) in as much as it is a concise reworking of the material used in bars 10-15. The bassoon part in bar 15 is a reworking of the flute part in bar 10; the bassoon/horn sound mass (bar 16) is derived from the bassoon/horn sound mass in bar 11-12. The flute/oboe sound mass (bar 17) is based on the bassoon/trumpet sound mass in bar 13; and finally, the structure of the chords in bar 18 is based on the structure of the chord in bar 15. (See Example 16. The colours in this example show how the recapitulated musical ideas relate; notice that the sequence of the ideas in bars 10-15 is preserved in the 'recapitulation'.)

SECTION 2: BARS 19-24

The second section of the first movement (bars 19-24) consists entirely of two opposing sound masses, which basically represents a dialogue between woodwind and brass. The brass sound mass is stated in bar 19 and comprises two note-groups, C-C# and F#-G (notice that these note-groups are a tritone apart). Two basic elements make up this sound mass. Firstly, the sustained chords played by trumpet, trombone and double-bass and secondly, the horn C# which, although part of the chord, does maintain a certain amount of independence by a) sustaining a single dynamic level, in contrast to the rapid dynamic changes within the rest of the chord and b) its staccato demi-semiquavers, in contrast to the sustained notes played by the other instruments. The woodwind sound mass is different in almost every respect, primarily because the timbre is very different, and although the horn and double-bass are playing in both chords, they change their sound for the woodwind sound mass (horn to cuivr ez and double bass to harmonics) and, therefore, there is no sense of unity between the two. The pitches used for each of the chords are also different, there is no doubling up of any note. The spacing is very different, the notes of the brass sound mass are relatively close and low down and, therefore, give an aggressive, dark quality to the chord, whilst the notes of the woodwind chord are spread over a range of 2 octaves and an augmented 4th and are generally widely spaced apart. The difference in the spacing of each of the chords combined with the contrast in rhythm makes the woodwind sound mass much lighter and springier in character.

The woodwind sound mass also consists of two note-groups, A-B and D#-F (these note-groups also being a tritone apart) which are spaced wide apart; the treble instruments (flute, clarinet and oboe) using A-B and the bass instruments (bassoon, horn and double bass) using D#-F. These two note-groups link up with the two note-groups in the bar 19 sound mass in as much as that the woodwind note-group (A-B) is an extension of the trombone/horn note-group (C-C#); and the bassoon/horn/double bass note-group (D#-F) is an

is an extension of the trumpet/double bass note-group (F#-G). (See Example 17) The two chords of the two sound masses between them use 10 of the possible 12-tones, the only notes missing (G# + D) also form a tritone.

As a result of the clash between these two sound masses in bars 19 and 20 the brass sound mass returns in bar 21 slightly changed. The notes, the dynamics and the chord structure remain the same, but the rhythm of the horn part is slightly changed.



This leads to a unifying of the two elements of the brass sound mass as they merge to produce a long held chord at the end of bar 21. Although bar 22 is marked 'tempo 1°' and, therefore, suggests the beginning of a new section, the music is, in fact, a continuation of bars 19-21, but also, by the fact that in the original edition of 1924 the term 'tempo 1°' was not used, but 'Animez un peu'. Bar 22 is a reworking of the woodwind sound mass from bar 20, which consisted of two note-groups, D#-F and A-B. The first of these note-groups (D#-F) is transposed from the bass parts in bar 20 to the treble in the first chord of bar 22 and written in exactly the same form. The other note-group (A-B) is transposed from the treble part of the sound mass in bar 20 to the treble part of the second chord in bar 22. (See Example 18) The placing of this chord corresponds rhythmically to the woodwind chords in bar 20, being played during the second half of each beat. Thus, the two elements from the sound mass in bar 20 are taken and split up and used to form the basis of new sound masses, which, although related, compete against each other in rapid alternation. Although these sound masses alternate very quickly and are both played by the same instruments, Varèse manages to make them sound different by changing the colour of the two chords. This he achieves by changing each instrument's relative position within the chord. (See Example 19)

SECTION 3: BARS 24-32

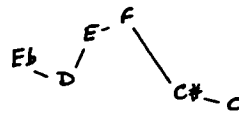
Bar 23 marks the beginning of the transition from the second main section of the movement (bars 19-24) to a section which is basically a recapitulation of the material used in the first section (bars 1-18). The trans-

ition between the two sections is marked by the simultaneous re-emergence of earlier ideas with the breakdown and echoes of ideas from the second section. In bar 23 the sustained chord with a crescendo is reminiscent of the brass sound mass in bar 21; the notes and the instruments used are not the same, but the $sf p$ \leftarrow provides a connection between the two and it does continue the pattern of woodwind/brass sound masses that started in bar 19. The trumpet solo in bar 23 marks the return of ideas from section one of this movement; the melody outlines a tone-semitone figure based on the material first heard in bar 1, but the solo is, in fact, more closely based on the clarinet figure from bar 5. Another link to section one is provided by the trumpet when, in bar 23, it starts its solo on a long A which, in effect, is the re-emergence of the long prominent A played by the trumpet in bars 10-13. In bar 24 the trumpet solo settles on an F# and then articulates a rhythm previously played by the horn in bar 13. The fact that the horn was playing this rhythm in bar 13 on a C and the trumpet note in bar 24 is a tritone higher becomes increasingly significant as this final section unfolds. Bar 24 is basically a reworking of bar 22 and, therefore, continues the sequence of alternating material from one bar to the next, a feature which has dominated this section.

Just as the horn part in bar 21 made a rhythmical shift as a result of the conflict with the woodwind sound mass in bar 20, so, in bar 24, the woodwind sound mass is delayed by one quaver as a result of the conflict with the contrasting sound mass in bar 23. Also the bar-length is increased to 5 beats in bar 24, to match the number of beats in bar 23, and is another indication of the gradual waning of this conflict, because, up to this point the bars containing the woodwind sound mass have been short bars (always $\frac{3}{4}$), while the brass sound mass has been played in longer bars, either $\frac{4}{4}$ or $\frac{5}{4}$. The rests between the set of chords in bar 22 is now $\frac{3}{4}$ of a beat and a new idea is inserted between the sets of chords. This idea, played by the flute and horn, is not a separate idea but a figure which is added to the preceding chords so as to transform the sound mass, and is actually leading into an entirely new idea, which appears at the end of the bar.

The double bass does not repeat its material from bar 22, like all the other instruments, but plays a long held G in order to form a major 7th, with the trumpet F#. The trombone plays the B-G previously played by the double bass. During the last quaver beat of bar 24 the flute repeats the Eb-D major 7th, this time not accompanied by the horn, and proceeds to introduce the new idea, which is, in fact, based on the flute figure in bar 10 - notice that exactly the same rhythm is used. (See Example 20)

The flute solo uses the note-group C-F and uses it in a special way. The unfolding of the melodic line represents a wedge-shaped pattern of growth of the tones within the note-group.



The line finally

settles on a C, is taken over by the clarinet and becomes a pedal point, a tritone above the trumpet F# pedal point. These pedal points are describing a conflict between the old pitch centre, represented by the Gb (trumpet F#) which is taken from the opening bar of the movement, and the newly emerging pitch centre, represented by the C of the clarinet and later of the oboe. The full significance of this conflict is revealed at the very end of this movement.

The pedal C is articulated by rhythms taken from the flute pedal G# of bars 11-13. Underneath these two pedal points the horn is playing a variation of the trumpet solo from bar 23. The subsequent repeats of this figure bring it closer and closer to the original version (played by the clarinet in bar 5). Example 21 shows the relationship between the various versions of this figure. In fact, in bar 27, the horn plays an exact repeat of the original, transposed up a major 3rd. At exactly the same point, the beginning of bar 27, the pedal C changes tone colour as it is taken over by the oboe. The oboe crescendo during the second beat of bar 27 asserts the dominance of the oboe C over the trumpet F#, subsequently the trumpet stops playing half-way through the second beat. Also at this point the music is now dominated by material from section one of this movement. However, on the third beat of bar 27, the clarinet, bassoon, trombone and double bass play an echo of the brass sound mass from section

two, bar 19. The chord, though at a different pitch (down a minor 3rd) is identical to the chord in bar 19, not only in regard to its intervallic construction, but also because the lower three notes of the chord form a crotchet rhythm accompaniment whilst the top part (bassoon) is more florid and soloistic in style. (See Example 22)

Because of the increasing importance of material derived from section one, sound masses taken from section two are influenced and transformed by section one material. For example, the bassoon part in bar 27 is based on the horn part in bar 19, as far as its function within the chord is concerned, but its melodic line and ornamentation is taken from section one. The unsettled oscillation between the two potential pitch centres (G# and A#) is reminiscent of the alternation between E and D# in the oboe solo in bars 1-3, and more particularly in bars 6-8, from where the ornamentation also derives. Furthermore, in the bassoon solo in bars 27-28, there is another note in the melodic line apart from the alternating G# and A#, that is the C# which forms the interval of a perfect 4th above the lower of the two alternating notes. In bars 7-8 the oboe solo also plays an extra note above the alternating pitch centres, and this note (G#) is also a perfect 4th above the lower alternating note. (See Example 23)

At bar 29 these three elements; oboe pedal point, horn pedal point and bassoon/clarinet/trombone/double bass sound mass merge into a single chord. However, this chord consists of two parts, even though all instruments play notes from a single note-group (C-F). Firstly, there is the main chord which consists of all the instruments except the oboe and, secondly, there is the oboe pedal C which remains independent by virtue of the distance of its pitch from the rest of the chord. (See Example 24)

The oboe emerges from the chord unaltered and continues to play the rhythmic pattern it was playing before the chord. After the pause on the first beat of bar 30 the oboe is once more an unaccompanied solo instrument and plays 'dans le sentiment du debut', an exact repeat, transposed up a tritone, of the first three bars of the oboe solo which first appeared at the beginning of the piece. It is at this point that the importance of the

pedal C, which was held constantly through bars 25-30, become apparent; the whole of the final section from bar 25 to the end manages, through the recapitulation of many ideas from section one, to lead gradually back to a restatement of the opening idea. The movement has come full circle.





SECOND MOVEMENT

The second movement is divided into three main sections; sections one and two each being divided into two, roughly equal, halves. The third section is not divided, but is equal in length to the sub-sections of sections one and two. (See Example 25)

The D \sharp -Gb note-group, from the opening of the work, dominates the pitch organisation of the first section of the second movement, just as the division of the first movement into three sections dominates the structural element of the second movement.

SECTION 1: BARS 1-35

SUBSECTION 1: BARS 1-16

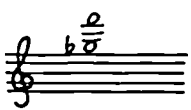

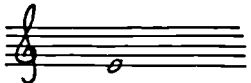
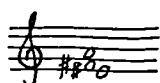
The opening of the second movement starts with ten bars of piccolo solo, playing rhythmic variations around a very strongly centred Gb pitch centre. The manner of the rhythmic variations is similar to the opening of the first movement and the similarity is reinforced by the use of the tones E, F and Gb, which derive from the note-group D \sharp -Gb used by the oboe in bar 1 of the first movement. The piccolo solo is made up from three elements. 1) the distinctive grace note figure. 2) the rhythmic articulation of the Gb. 3) long sustained Gb. (See Example 26) Within the rhythmic element of the piccolo solo four basic types of rhythmic patterns are used: A)  B)  C)  D)  . The first three patterns are used as the basis for further variation, whilst the fourth (D) is used later in the movement to form an opposing sound mass.

In between short periods of rhythmic activity the music comes to rest on the sustained Gb (element 3). The length of the sustained Gb varies with each successive pause, but there is a pattern in the variation; each sustained Gb gets shorter until bar 6, then from bar 6 onwards the pauses get longer. The increase or decrease of tension at any one moment is directly related to the length of the sustained Gb. Thus, the tension in the sound mass increases until bar 6; from then on, until the eventual break-


down of this sound mass at bar 30, the tension decreases.

The piccolo solo is split into two halves, bars 1-6 and bars 6-10, and in each half there is an identical pattern of alternation between rhythmic activity and repose. Example 27 shows the pattern of alternation; A, B and C represent the types of rhythmic pattern, as described above, and R represents the note of repose. As the diagram clearly shows, the interesting point about the rhythmic variations is that it follows an orderly sequence, varying the different rhythmic types in a specific order and repeats exactly that order in the second half of the solo.

At bar 11, as a result of the entry of the clarinet F, the rhythmic variations cease and are replaced by a sustained major 7th pedal point, which is held until it is broken up by the introduction of an opposing sound mass (bassoon/horn/double bass) at bar 17. The notes that make up the pedal point are still within the note-group used by the piccolo solo and indicates that the pedal point is an extension of the piccolo solo. The next section, bars 17 to 35 consists of four sound masses:-

1) 	2) 	3) 	4) 
Piccolo/ Clarinet	Bassoon/Horn/ Double bass	Trombone	Trumpet/Clarinet/ Oboe

The piccolo/clarinet sound mass is made up from the note group F-Gb and, being a continuation of the piccolo/clarinet pedal point, represents the status quo and is the object of the other sound masses opposition.

The bassoon/horn/double bass sound mass (No. 2) consists of two chords. The structure of the second chord is, roughly speaking, a mirror image of the first. Together, these chords form a note-group which consists of three pairs of neighbouring notes. (See Example 28) These chords maintain their close association right through to the end of the section, but undergo changes in rhythm, timbre, dynamic and articulation. It is this sound mass which adopts the rhythm . (type D) from the piccolo

solo and becomes one of the most prominent rhythmic elements in the sound mass and appears at bars 20, 24, 30 and 33. (See Example 29)

The trombone sound mass is a little different from the rest, in that it is melodic in nature, a contrast to the chordal or vertical character of the other three sound masses. It is, also, the only sound mass that is not in opposition to the piccolo/clarinet sound mass. It has the note E as its centre which is ornamented by lower grace notes. It alternates between rhythmic activity and repose in such a way that it shows a strong connection to the piccolo solo at the beginning of the movement. The choice of a note which is adjacent to the piccolo note-group (F-Gb) strengthens the connection, and there are now three of the notes of the original D \sharp -Gb note-group from the opening of the work.

The fourth sound mass, played by trumpet, clarinet and oboe, consists of the notes E \sharp , F \sharp and A, and is always closely associated with the bassoon/horn/double bass sound mass (No. 2). Whenever the trumpet/clarinet/oboe sound mass is used it always follows on directly after the bassoon/horn/double bass sound mass. (See bars 25-26 and bar 31). There is also some similarity in the construction of the chords in each of the sound masses. Example 30 shows that all the chords consist of a semitone clash plus one other note. All the sound masses together form the note-group D-B. The fact that the notes of each of the sound masses overlap indicates a certain relational quality between the sound masses, they interact rather than directly oppose one another. (See Example 31. The ringed numbers refer to the sound mass number).

It is fairly unusual in Varèse's music, where several sound masses take their notes from a single note-group, for instruments to double up on any of the tones. It can be seen from Example 31 that this does, indeed, happen here. The Gb is played by piccolo and clarinet, the F by clarinet and oboe, the D \sharp by trombone and double bass and the D by trombone and horn. Strictly speaking, though, they are not exactly the same notes,

for when a note is shared by two instruments, one of the notes is enharmonically changed. Varèse quite deliberately, for instance, gives the piccolo in sound mass 1 a Gb and the clarinet in sound mass 4 an F#, the clarinet in sound mass 1 plays an F, whilst the oboe in sound mass 4 plays an E#. All the doubled notes are changed in this way unless they are doubled only by a note within the trombone glissandi. Although, to the listener, the notes sound exactly the same Varèse nevertheless adopts this technique as an aid to the process of composition and to the reader of the music, for whom the separation between, rather than the unity of, the piccolo Gb and the clarinet F#, for instance, becomes apparent.

The pitch centre E, played initially by trombone and later by the horn, provides the musical focus of this section and tends to be rhythmically active when the other sound masses are inactive. Around the ornamented pitch centre of the trombone the main conflicts of the section are enacted; the three participants being piccolo/clarinet (sound mass 1), bassoon/horn/double bass (sound mass 2) and trumpet/oboe/clarinet (sound mass 4).

The piccolo/clarinet sound mass gradually declines as it is broken up, as a result of the opposition from sound mass 2 and sound mass 4. The notes of repose are lengthened and the gaps between the appearances of the sound mass become longer. With each entry of this sound mass the clarinet joins in a little sooner, a process which reflects the sound mass's decline. In bar 18 the clarinet starts one beat after the piccolo, in bar 21 it starts one semiquaver later and in bar 28 (the sound mass's final appearance) the piccolo and clarinet start at the same time. The decline of this sound mass is also expressed by its rhythmic development and by the use of dynamics. Rhythmically the first two appearances of the sound mass are equally active and the decline is shown by the use of dynamics; the first entry is marked *p* and the second, *pp* with a diminuendo. The final appearance, although louder (*mp*), is rhythmically less active. The commas in bars 28 and 29 indicate attempts to restart the sound mass


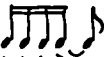
and the transition from accented notes to marcato indicates the final stages of decline as the sound mass fails to initiate its characteristic semiquaver rhythm. It finally fades away with a diminuendo from mp to pp.

The demise of the piccolo/clarinet sound mass is coincident with the decline of the E pitch centre, further evidence of the link between these two sound masses. In fact, it was the change of timbre of the E (brought about by the forte entry of sound mass 4 at the end of bar 25) from trombone to horn, at the half-way point of this section that marks the moment at which the piccolo/clarinet sound mass begins to fade. In bar 27, a bar in which all other instruments are silent, the horn plays a C (a note which is outside the sound mass note-group) and upsets the equilibrium so much that the horn, without any further rhythmic activity, fades into nothing, taking the piccolo/clarinet sound mass the same way. (See Example 29)

The main opposition to the piccolo/clarinet sound mass comes from the bassoon/horn/double bass and the trumpet/clarinet/oboe sound masses. The trumpet/clarinet/oboe sound mass never plays independently, and is usually joined on to the end, of the bassoon/horn/double bass sound mass. For example, in bar 25, the trumpet/clarinet/oboe sound mass completes the triplet crotchet rhythm started by the bassoon/horn/double bass sound mass and the same thing happens in bar 31. (See Example 29)

SUBSECTION 2: BARS 17-35

In the first half of this section (bars 17-26) the bassoon/horn/double bass sound mass is the more dominant of the two sound masses that oppose the piccolo/clarinet sound mass; but in the second half the trumpet/clarinet/oboe sound mass becomes dominant. This change can be seen (Example 29) in bars 33 and 34, where, after the rhythmic activity of the bassoon/horn/double bass sound mass in bar 33, the sound mass settles on a sustained chord with a diminuendo from ff to ppp, whilst at the same time (significantly the two sound masses have never before sounded together) the trumpet/clarinet/oboe sound mass plays a sff chord followed by rhythmic

activity (and, therefore, is already more prominent than the sustained chord of the bassoon, horn and double bass) followed by a crescendo from p to ff. By bar 35 the trumpet/clarinet/oboe sound mass is totally independent of the bassoon/horn/double bass sound mass. The rhythms used by the trumpet/clarinet/oboe sound mass in bars 34 and 35 are taken from the trombone and piccolo/clarinet sound masses at the beginning of this section. The  rhythm in bar 34 is taken from the trombone part in bar 19 and the  rhythm is taken from the piccolo/clarinet sound mass in bars 18 and 21, even the articulation is identical. Because of this reference to the first half of this section the E pitch centre returns in its original form; the start of the note is rhythmically identical to the start of the solo in bar 17, and it is again played by the trombone instead of the horn.

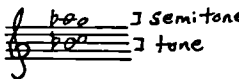
Example 32 shows the overall plan of the interaction between the sound masses in this section. The trombone part is added to shows its link with the piccolo/clarinet sound mass, the vertical dips in the line represent changes of pitch (the lower grace notes) and the rhythm is superimposed on the line. Notice that the sound masses never play all at once. This example also demonstrates how the bassoon/horn/double bass and trumpet/clarinet/oboe sound masses expand to fill the ever-widening gaps left by the piccolo/clarinet sound mass.

The reappearance of the trombone solo E in bar 35 provides the link into the next section (bars 36-49). The beginning of the section is also marked by the first change of time signature in this movement; bars 1-35 have all been $\frac{3}{4}$ bars, bar 36 is in $\frac{5}{4}$ and from this point on changes of time signature are more frequent.


SECTION 2: BARS 36-66

SUBSECTION 1: BARS 36-49

The trombone E is joined by the bassoon and double bass playing F and F# respectively and with the D and Eb trombone glissandi forms the note-group D-F#. The F-F# pedal point is reminiscent of the F-Gb pedal point played

by the piccolo and clarinet in bars 11-30. Against the two related elements of the F-F# pedal point and the trombone solo an opposing sound mass which is formed by trumpet, oboe, horn and clarinet enters halfway through bar 36. The rhythm of the sound mass is derived from the rhythm of the last appearance of the piccolo/clarinet sound mass (bar 28). The trumpet/oboe/horn/clarinet sound mass does not use a complete note-group but has two pitch areas, each of which contains two notes, one pair forming a semitone and the other a tone  The gap between the two pitch areas is partially filled by the note-group formed by the bassoon/double bass pedal point and the trombone solo (D-F#). Thus, A, C# and B are the three missing notes; these are added later and when they are introduced, they dramatically alter the course of the music's development.

At the beginning of bar 37 both the bassoon/double bass pedal point and the trumpet/oboe/horn/clarinet sound mass undergo changes in tone colour. (See Example 33) The change of timbre leads to a fundamental change in the character of the trombone solo as it suddenly, for the first time in this movement, starts playing wide intervals, becomes rhythmically very active and omits the grace notes which, up until now, have been such a distinctive feature of the trombone solo. The trombone alternates between D and C#, a major 7th apart, thereby extending its own note-group to C#-E. The C# is now a more permanent part of the trombone solo and, thereby, reveals the purpose of the brief introduction of this note in bar 26.

The rhythm , which appears twice (once in bar 37 and once in bar 38) is taken from the opening of the first movement of Octandre, not only from bar 1 and bar 2, but more particularly, from bar 9 where the dotted quaver is tied over into the next beat and the interval is also a major 7th. This rhythm was also used by the bassoon/horn/double bass sound mass which opposed the trombone E earlier in this movement (see bars 20, 24 and 30); the triplet crotchets in bar 38 have also been taken from the same source (bars 25 and 31). It is as though the trombone solo, having survived into this subsection, has absorbed some of the elements

which were associated with the sound masses which opposed it. The dramatic change in the character of the trombone solo, having been the object of other dramatic changes, now exerts an influence that alters the character of the F-F# pedal point, for, in bar 37, as a result of the trombone C# filling the gap between the C and the D of the woodwind note-group, the bassoon and horn pedal point begins a crescendo from mf to sf and comes to an abrupt stop at the end of the bar. The point at which the F-F# pedal point stops playing the double bass plays a fff tremolo B (bar 38), this note fills the gap between the Bb and C of the clarinet/piccolo/oboe/trumpet sound mass. On the second beat of the following bar the horn plays accented triplet quavers on A, the note which fills the final gap in the note-group which has formed the basis of this subsection so far. The completion of the 12-tone note-group results in the gradual dispersion of the clarinet/piccolo/oboe/trumpet sound mass.

Example 34 shows how this note-group has been built up from bar 36 to bar 39. Although the addition of the A completes a 12 tone note-group for this subsection it has more of an impact on the development of the music because it, more specifically, completes the note-group used by the clarinet/piccolo/oboe/trumpet sound mass. Just as the Bb, played by the clarinet in bar 13 of the first movement of octandre, completed the note-group used by the flute, bassoon, horn and trumpet and resulted in a change to the previously static sound mass, so the addition of the B and A to the clarinet/piccolo/oboe/trumpet sound mass's note-group puts an end to its inactivity. The change does not result in aggressive action but in a slow disintegration of the sound mass. Each instrumental part moves very slowly in an independent rhythm, the rhythmic movement and the melodic lines of the instruments lead to a climax at the beginning of the sound mass. During these three bars instruments gradually move away from the original G-C note-group and begin to form another note-group. Example 35 shows how the piccolo, on the second beat of bar 39, stops playing the G from the G-C note-group and plays a note outside this group (E). The


clarinet then stops playing the Ab and joins the piccolo by playing an F, the piccolo then transposes this note-group a semitone higher by playing an F# instead of the E. Also, at the beginning of bar 40 the double bass stops playing the B which means there are now no adjacent notes from the G-C note-group remaining. However, during bar 40 the trumpet and clarinet play A and Ab respectively and the initial note-group begins to be reformed.

On the first beat of bar 41 the piccolo plays a B and, therefore, joins the C of the oboe to form another part of the original note-group. These two pairs of notes, B-C and Ab-A, are then condensed into a single note-group when the oboe stops playing the C and plays a Bb, thus creating the note-group Ab-B. Although C and B are added at the beginning of bar 42, the note-group comes no nearer to being totally reformed because at the same moment the A and Ab cease.

The sound mass has become more settled again but has obviously been dramatically transformed by the turmoil of bars 39-41. At this point, as the sound mass resettles, the trombone solo returns to play a sustained E, starting with measured grace notes (triplet semiquaver Eb-D-Eb). As this happens further change takes place in the sound mass, not pitch changes this time, but changes in timbre. In bar 42 the horn C is taken over by the clarinet, in bar 43 the trumpet B is taken over by the bassoon and in bar 44 the piccolo Eb is taken over by the trumpet. In bar 43 the horn plays an F# and when it is joined, halfway through the bar, by the double bass F# the minor 9th pedal point from bars 36 and 37 is finally restored.

It is now clear that this section from bar 36 starts with three elements 1) F#-F pedal point, 2) trombone solo E plus grace notes and 3) high woodwind sound mass. As a result of the trombone shift to D/C these elements undergo a process of transformation and in bar 42 they return, but in a new form.

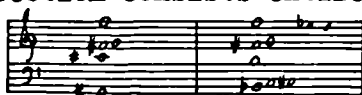
In bar 45 changes occur in the F#-F pedal point:- the movement in the horn

part results in the introduction of the  rhythm which is, not only, taken from the piccolo solo at the beginning of this movement, but also, (perhaps more significantly) from the final appearance of the trumpet/clarinet/oboe sound mass in bar 35. In bar 46 the double bass changes from the F \sharp to D and this effects a change of timbre of the E, from trombone to trumpet. In bars 48 and 49 the horn and double bass play a variation of these changes which bring about the end of the solo E as the trumpet swoops up a minor 9th to a *sff* F \sharp , a note which heralds the beginning of a new section.

The interplay of the different elements within this section can, perhaps, be more clearly seen in graphic form in Example 36. The vertical axis represents pitch and the horizontal axis represents time. The red line represents the solo E, played by trombone and trumpet, the blue lines represent the F \sharp -F pedal point and the green lines the upper woodwind sound mass.

SUBSECTION 2: BARS 50-66




This subsection consists entirely of material based on the alternating chords.





The first chord consists of the note-groups F-A and the single tone C \sharp . The gaps between the note-groups are filled by the second chord which also consists of two note-groups; B \flat -E \flat and F-G. The second chord supports a melodic fragment (E \flat -D) played by the clarinet, which, in fact, follows on from the trumpet F of the previous chord and forms, therefore, the tone-semitone sequence that was so important in the structure of the first movement. (See first movement clarinet solo bar 5, trumpet bar 23 and horn bars 26-27). The melodic line (F-E \flat -D) and the three highest notes of each chord create a degree of unity between the two chords despite the fact that both the melody and the chord change timbre and dynamic between one bar and the next.

All other aspects of each chord have been designed to create the kind of contrast that was so obvious in the alternation of the woodwind and brass sound masses at bars 18-24 of the first movement. Significantly, it was

during this section of the first movement that the tone-semitone solo melody was played by the trumpet. I think there is a connection between the two, because, in the first movement each sound mass had its own time signature, in the second movement the chords do not alternate so evenly but the first chord always plays in whole number time signatures whilst the second chord is dominated by time signatures which contain half-beats. e.g. $\frac{3\frac{1}{2}}{4}$, $\frac{2\frac{1}{2}}{4}$ etc. In both sections the dynamic level of each of the contrasting elements is controlled so as to emphasise the independence of each. In the second movement, however, the alternation between the two dynamic levels is more consistent - the first chord always plays *ff* and the second chord always plays *mp*.

The rhythmic element is expressed by the octave displacement of the notes of the horn, trombone and double bass parts in the first chord and by the clarinet solo in the second chord. The distinctive part of the clarinet's rhythm is at the beginning of the bar when it changes from the Eb to the D; in bar 51 it plays  but in subsequent bars this rhythm develops into  which is, in fact, taken from the rhythm played by the first chord in bar 50. Once this rhythm has transferred to the second chord it no longer appears in the first chord. This rhythm originates from element "D" of the piccolo solo bars 1-10 of this movement, and was also used by the bassoon/horn/double bass sound mass in bars 20, 24, 30 and 33 and the trombone solo in bars 37 and 38. The rhythm played by the clarinet in bar 51 () was originally played by the trumpet/oboe/clarinet sound mass in bar 34. The use and re-use of such rhythmic elements, as well as sometimes having a structural significance, is a manifestation of Varèse's view of rhythm as being '.....the element in music that gives life to the work and holds it together. It is the element of stability.....'²

Varèse's use of articulation also helps create contrast between the moving parts of each of the chords. The horn, trombone and double bass notes of the first chord are always marked > , whilst the clarinet in the second chord uses a mixture of > and v . However, the notes in the first beat

of the clarinet solo, whether using the  or the  rhythm, are always marked with an accent, whilst the repeated D's, at least in the first half of this section, are always marked \vee . In the second half (bar 57 onwards) the D's alternate between $>$ and \vee eventually mixing the two together when triplet quavers are introduced in bar 65, the final appearance of this figure.

The alternation between the first and second chord reveals no regular pattern of dialogue, but as this section develops it is clear that the first chord changes from being the larger of the two chords at the beginning to being the shorter of the two by the end of the section. The change in dominance of one chord over another does not occur by consistent degrees of growth or decline, there are, for instance, times in this section when the length of both of the chords increases and times when the length of both chords decreases. Example 37a and 37b show the development of the lengths of both chords in this section. Example 37a graphically represents the length of each bar, the top line indicates the length of the first chord and the lower line indicates the length of the second chord. Example 37b shows the relative increase or decrease in length of each of the chords; the vertical axis of the graph represents the length of the chord while the horizontal axis represents time.

The change in timbre during the F-Eb-D melodic line, which spans each two-bar unit, indicates that there is, not only, a conflict between the two chords used in this section, but that there is also a conflict between pitch centres. There are, in fact, two pitch centre conflicts taking place, each working on a different level. Firstly, there is the conflict between the trumpet F and the Eb/D pitch centre of the clarinet. This is the most obvious of the two conflicts as the alternation between the pitch centres coincides with the natural antipathy between alternate bars, which means that the growth of the dominance of the second chord over the first chord is synonymous with the increasing importance and eventual supremacy of the Eb/D pitch centre over the trumpet F. The second conflict, which operates on a more subtle level, is the conflict between the Eb and the

D of the clarinet part. This conflict is never fully resolved, although in the second half of the section the number of repeated D's increases, and in its last bar (bar 65) becomes more complex, in its rhythm and in its articulation. This suggests an increase in its importance, while the Eb never develops from being a single accented semiquaver at the beginning of each alternate bar.

The operation of conflict on two levels, as used in this section, is the same as that used in the section from bar 17 to bar 35 of this movement. There, both the bassoon/horn/double bass and the trumpet/clarinet/oboe sound masses were opposing the piccolo/clarinet sound mass; but at the same time there was a conflict between the bassoon/horn/double bass sound mass and the trumpet/clarinet/oboe sound mass.

The flute figure in bar 66 provides the link to the next section, fulfilling the same function as a similar figure played by the bassoon at bar 15 of the first movement. Both figures, as indeed does the similar flute figure in bar 10 of the first movement, abound in the intervals of augmented 4th and major 7th (or in its inversion, the minor 2nd). This kind of figuration is often used by Varèse as a link between sections, it is always played soloistically, having very little accompaniment, if any, and is frequently played by the flute. (Bar 20 in Hyperprism and bars 14 and 42 of Chanson de la haut provide further examples.)

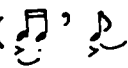
SECTION 3: BARS 67-81

The flute figure in bar 66 of the second movement of Octandre settles on an Eb which is taken up by the trumpet. Because this figure settles on an Eb it seems to imply a resolution of the clarinet Eb/D conflict, of the previous section, in favour of the Eb. However, the flutter-tonguing of the trumpet combined with the dramatic crescendo from p to sfff shifts the pitch centre to an E \sharp . The crescendo also results in another change of timbre as the E is then taken up by the oboe at the beginning of bar 67. The oboe is joined by the clarinet to form a new sound mass, and the E

is surrounded by notes which form the note-group A-B. Although the two instruments play in rhythmic unison from bar 67 to bar 69 the hurried nature of the rhythm combined with the frequent breaks between rhythmic bursts and the wide jagged intervals give the sound mass a very unsettled and volatile character.

At the beginning of bar 69 the sound mass momentarily settles on a minor 9th pedal point (Bb-Bq) echoing the F#-Fq minor 9th pedal point found in bars 11-30, 36-37 and 43-49 of this movement.

The sf > p of the clarinet/oboe pedal leads to the introduction of a second sound mass which is initiated by the brass then joined by the bassoon and the double bass. The two sound masses are made up from the note-group Ab-F. The brass sound mass uses three pitch areas with two gaps which are occupied by the notes used in the clarinet/oboe sound mass.

The distribution of the notes between the sound masses is shown in Example 38. The brass sound mass is fairly unusual in the way it starts; although the rhythm used () is quite typical of Varèse's style. It gradually develops from a two-note sound mass, the first semiquaver consisting of a D and Eb, on the second semiquaver this grows to C, Db, Ab and after the comma the final pitch characteristic of the sound mass is evolved - Ab, F, Db, C - as shown in Example 39. The sense of growth is enhanced by the gradual increase in the number of notes being played. On the first semiquaver two notes are sounded (although there are three instruments playing the D's played by the horn and the trombone), on the second semiquaver three notes are played and by the time the sound mass settles on its sustained chord it has grown to a four-note sound mass.

As the brass sound mass reaches its full development the clarinet/oboe sound mass responds with a crescendo from p to sfff. The comma at the end of the crescendo indicates the finality of the crescendo. The wide, leaping intervals of bars 67 and 68 return for two beats before the sound mass eventually ceases. The return of the rapid intervals of the clarinet/oboe sound mass result in a change of timbre in the brass sound mass as

the trombone, whose C was duplicated by the double bass, stops playing and leaves the double bass to play the C alone. The note group used by the two sound masses resulted in the omission of the tones F# and G and when the piccolo enters, at bar 70, it starts its melodic line with the notes F# and G, thereby completing a 12-note group.

Although the clarinet/oboe sound mass collapses at bar 70 there are elements of the brass sound mass which survive into the next section. The bassoon F, for instance, is doubled up by the oboe at bar 71 and they continue to play a unison line as far as bar 75 where they return to a sustained F. This F is maintained until bar 77 where the bassoon, after a diminuendo, fades out, leaving the oboe to continue the sustained F. The double bass, as already discussed, continues, until bar 73, the sustained C it once shared with the trombone. Finally, the Db of the horn part, in bar 69, is continued, albeit an octave higher, by the clarinet in bars 71-73.

The rhythmic content of the final passage of this movement (bars 70-81) is constructed from three basic units of rhythm and their derivatives. Two of the three units are first heard in the piccolo/clarinet line in bar 70. The third unit originated from the piccolo solo (bars 1-10 of this movement, classified as element "D") and because of its regular use, this rhythm has helped to provide unity and continuity to the whole structure of this movement. (See Example 40) Units 2 and 3 are the basic material used in providing distinctive highlights to this section and are used at the moments of greatest rhythmic activity. (See Example 41) However, the bulk of the rhythmic structure of this passage is built upon variations of unit 1, shown in Example 42. These rhythms pass from one part to another and together produce a gently flowing, uncomplicated rhythmic background. The combined effect of all three rhythmic units results in the rhythm shown in Example 41. The upper part shows the heightening effect of units 2 and 3, the lower part shows how unit 1 and its derivatives are used to form a rhythmic backdrop.

The movement of the individual parts in this final section, as well as combining to produce a rhythmic background, also combine to produce constantly fluctuating note-groups. The movement of these note-groups gradually leads to the creation, in bars 79-81, of two distinct and relatively stable note-groups. Example 43 plots the movement of these note-groups, shown here by the yellow bands. Notice that the only time there are no note-groups is the period in bar 70 immediately following the completion of a 12-tone note-group by the piccolo F# and G (already discussed above). Generally speaking there are only two note-groups in operation at any one time, the only exception being at bar 76. One interesting fact about the way Varèse creates these note-groups is that they are never suddenly introduced in their entirety, they always grow from the introduction of a single note which is then joined by another note, or two notes, to form a new note-group.

The piccolo F# in bars 78-81, being an enharmonic equivalent of Gb, is a clear reference to the piccolo solo in bars 1-10 at the opening of this movement. The connection between the two is made especially obvious by the use of the grace notes at the beginning of bar 80, which comprise exactly those notes that formed the grace notes of the piccolo solo. The triplet crotchets rhythm in bar 78 is, not only, taken from the unit-2 rhythm of this section, but also, from the piccolo solo itself in bar 10. Once again Varèse completes a section using a chord which finishes suddenly on a semiquaver at the climax of a p to sfff crescendo and enhances the effect of obliteration by the use of flutter-tonguing.

The construction of the final chord of the movement is significant in that it represents the meeting of past and future material. The top four notes of the chord form one note-group and the lower five notes form another, as shown in Example 16. The top note-group Eb-F# is the same as the D#-Gb note-group used by the oboe in its solo at the opening of the first movement; and the lower note group G#-C is used as the basis of an important chord which appears in the final movement. This final chord also shows

the spacing of the notes which is so typical of Varèse; most of the intervals form a major or minor 7th with a zone of intensity in the mid-treble part of the chord. (See Example 44)

THIRD MOVEMENT

The final movement of Octandre consists, for the most part, of material that was used in the first two movements. Just as the last section of the first movement acted as a recapitulation, so one of the functions of the third movement is to act as a recapitulation of the whole work.

The movement is divided into four sections, each new section clearly marked by a change of tempo, a technique commonly used by Varèse. The four sections are: an introduction (bars 1-8), followed by three sections of similar length (bars 9-23, 24-45 and 46-60). Although sections two, three and four are not equal when numbers of bars or, even, numbers of beats are calculated, they do prove to be roughly equal when the length of each section is calculated using Varèse's metronome markings.

Section 1.	Introduction	bars 1- 8	23	secs.
Section 2.		bars 9-23	33.6	secs.
Section 3.		bars 24-45	31.6	secs.
Section 4.		bars 46-60	37.2	secs.

INTRODUCTION: BARS 1-8



The introduction is divided into two parts, the first being dominated by two solo melodies played by bassoon and double bass. The two instruments use an 11-tone note-group comprising the tones G-F, thereby omitting F#. The F# is omitted because of the importance of the piccolo high F# at the end of the second movement. The first solo line (bassoon) seems to grow out of the double bass solo B which was used as a link between the second and the third movements. The two solo lines are very similar and the way the double bass is made to answer the bassoon line prefigures the quasi-fugal section that follows at bar 9. Comparing the two melodies in Example 45 shows how, the last bar excepted, the rhythm of each is identical and that each melody is divided into two halves (shown by brackets). Within each melody there is an intervallic characteristic set out at the beginning of the first half, which is repeated at the beginning of the second half.

The opening of the bassoon melody, for example, consists of two intervals of a tone (C-Bb and Bb-C), this sequence is repeated and inverted at the triplet quavers (F-G and G-F). The same thing happens in the double bass solo except it starts with semitone and tone intervals (C-B and B-C#), significantly this combination of intervals was structurally very important in the first and second movements. At the triplet quaver figure this, too, is inverted (Bb-B and B-A). There are further similarities in the use of intervals; in the second bar of the bassoon melody, for example, there is an interval of a tone (C-D) which is repeated by the first two notes of the melody in bar 3 (Eb-F). The same method of construction is used in the double bass version but using a different interval - a diminished 5th, (bar 2, C#-F: bar 3, E-Bb).

It is, not only, the texture of the opening passage which hints at the fugal section that follows, but also, the development of the solo line; played firstly by the bassoon then answered and developed by the double bass. Example 46 shows how the melody, in the form played by the double bass, is approaching the melodic and rhythmic outline of the "fugue subject" as played by the oboe at bar 9.

There are also certain intervallic similarities between the double bass line and the oboe "subject". For instance, the first interval in the oboe part is a semitone (C#-D) and the first interval in the double bass part is a semitone (C-B). The second interval of both parts is a tone, though the interval is written as a diminished 3rd in the oboe line. The distinctive major 7th in the oboe part (F-E), which is taken directly from the F-E major 7th of the double bass part. Perhaps an aurally more striking

similarity between the two parts is the use of the triplet quaver rhythm which, in both cases, is ornamented by an acciaccatura played before the second quaver in the double bass part and before the third quaver in the oboe part.

At bar 7 the double bass fades to a *pp* as its sustained A is taken over by the horn which then holds the note until the end of the section. Over the horn sustained A, there appears the first overt recapitulation as the bassoon and trombone play material taken from bar 17 of the first movement, where it was played by flute and oboe a minor 10th higher. There are, however, subtle alterations to the music when it appears in the third movement. Firstly, the first beat is omitted and the trill starts on the second crotchet. Secondly, the trombone plays a flutter-tongued $G\sharp$ instead of a trill (this is because in this part of its range the trombone cannot play a semitone or tone trill). Thirdly, the articulation in the bassoon part is changed on the quaver E and it plays a  rhythm on the last beat of the bar instead of the  played by the oboe in the corresponding place in the first movement. Fourthly, the decline of the sound mass is not marked by a crescendo as it was in the first movement. Finally, the last trombone note finishes earlier than its counterpart in the first movement. This is done because of the particular structure that is required for the chord which is used to close the introduction.

The bassoon and trombone lines use two note-groups, C-E and $F\sharp-G\sharp$ which, because the trombone does not play a trill on the $G\sharp$, means that, although this is a transposed version of the flute and oboe idea in the first movement, the two note-groups do not, exactly, match the note-groups used in the first movement, which were $Eb-G$ and A-C. Taking the transposition into account the second note-group, used by the bassoon and trombone should be $F\sharp-A$. It now becomes apparent why the horn sustained the A to the end of bar 8; so that the $F\sharp-G\sharp$ note group is expanded to $F\sharp-A$, thereby making the recapitulation complete. On the last quaver of bar 8 the flute, trumpet and double bass join the bassoon to produce a 5-note chord which uses the

same note-group that was used by the lower note-group in the final chord of the second movement.

SECTION 2: BARS 9-23

During the fugal passage of this section the time signatures are arranged in such a way that each statement of the subject and the counter-subject has the same pattern of bar-lengths. (See Example 47) The term counter-subject is used loosely as there is only a passing resemblance between the 'counter-subject' played by the oboe (bars 12-14) and that played by the bassoon (bars 15-17). Example 48 shows that there is a similarity in shape, the general rise and fall of each phrase and, most importantly, the way in which each plays a similarly shaped triplet quaver figure at the half-way point. The counter-subjects do not have note-groups of their own but use tones which extend the note-group already used by the subject. The oboe counter-subject also makes use of motives from the first movement; the D \sharp -E mordent derives from the oboe part in bar 7 of the first movement and the F-E major 7th already commented about in regard to the subject, extends the use of this interval (it is used three times in the counter-subject, in bars 11, 12 and 13).

The subject, when played by the oboe, uses the note-group B-F, and when the bassoon states the subject it uses the note-group F-C. The note-groups, being a perfect 5th apart, comply with the traditional form of fugal writing where the second voice enters in the dominant key. This is an example of Varèse combining an ancient form with his own theories of musical composition. The first few notes of each note-group unfold in ascending order and when the final two pitches are introduced it transforms the development of the line into a "wedge", a technique similarly used for the flute solo in the first movement of Octandre, bars 24 and 25. (See Example 49)


The main feature in the development of the fugue is the gradual transformation of the subject. Again, this is an example of Varèse using a trad-

itional idea, the fugue subject, and imposing on it his own personality and compositional characteristics by treating it as he would one of his own sound masses.

The second statement of the subject is identical to the first and, as already mentioned, is quite "proper" in entering a fourth below the first statement. It is at the third entry of the subject, played by the clarinet at bar 15, that the subject begins to change. The rhythm played by the clarinet is exactly the same as the original form of the subject, but the melodic content is altered. The clarinet uses the note-range B-A (the "tonic") which is the same as that used by the oboe subject and counter-subject but omits the F#. The order in which the notes are used is also changed, though the characteristic chromatic unfolding of the note sequence is still employed.

The shape formed by the first three and last three notes in the clarinet subject is based on the counter-subjects played by the oboe and bassoon. The note-group "shape" which is common to all three, is a series of three notes, two of which form the interval of a minor 3rd or a tone, which is either preceded by the G and succeeded by the G#. This idea is developed further in the bassoon counter-subject, where, if we ignore the remote F, there is the wider interval formed by C# and D# (the minor 3rd of the oboe counter-subject now reduced to a tone) followed by the note (D) that comes between the C# and D#.

The use of the tone-semitone idea is taken a stage further in the clarinet subject. The subject starts and ends with a tone-semitone figuration; at the beginning the semitone precedes the tone (C-Db-B) and at the end the clarinet plays a retrograde version of the same figure (G-A-Ab). This technique is similar to that introduced in the oboe and bassoon melodies in bars 1-8, where a sequence of intervals played at the beginning of the melody was repeated, though inverted, at the end of the melody. (See page 74/75 and Example 45.)

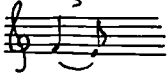
Just as the elements of the counter-subject have been developed, so the fugue subject itself undergoes a process of transformation. Example 50 shows how the first two statements of the subject do not alter, but that the third, as already mentioned, is varied. The final appearance of anything that resembles the subject is played by the double bass in bars 18 and 19. Although, at first sight, this statement appears to have very little to do with the original subject, there are enough similarities to prove a connection between the two. In Example 50 five elements which are common to both are shown. These are 1) a dotted quaver which is immediately followed by 2) the  rhythm which is taken from the oboe/bassoon subject 3) the augmented 4th used by this rhythm is, however, taken from the clarinet subject 4) the triplet quaver figure as found in all four statements of the subject as well as in the counter-subjects. 5) the Bb-C# diminished 7th of the double bass subject is an inversion of the minor 3rd quavers found in the oboe and bassoon subjects. As the double bass plays its version of the fugue subject there is no longer any recognisable counter-subject to accompany it. The introduction of a new sound mass over the final statement of the fugue subject provides a bridge passage into the coda of this section.

The new sound mass is introduced, in bar 18, by the flute, horn and trumpet, whilst the chord held by the clarinet, oboe and bassoon represents the remnant of the fugue material which fades out in the next bar. However, the bassoon sustains the D after the other instruments have stopped playing and, at the beginning of bar 20, takes over the double bass C#. This indicates that material once associated with the fugue has now reformed itself into a new sound mass to oppose the flute/horn/trumpet sound mass. The moment at which the bassoon/double bass sound mass is formed the flute/horn/trumpet sound mass changes timbre; the clarinet taking over the horn D and the oboe taking over the trumpet B.

From this point on the flute/clarinet/oboe sound mass gradually gets higher. Varèse employs two-tone note-groups to help emphasise the rising

nature of the sound mass. Example 51 shows how the two-tone note-groups are used. In this passage each new note-group is formed without either of the notes being prepared; unlike earlier examples of this moving note-group technique as found in such passages as bars 39-42 and 67-77 in the second movement of Octandre.

The ascent of this sound mass is given further momentum by alternating notes of repose and bursts of rhythmic activity. The notes of repose and the moments of rhythmic activity both get shorter as the sound mass develops, this is particularly noticeable in bars 22 and 23 where the number of articulated notes in the sextuplet is five, in the quintuplet is four and in the triplet figure is three. As the flute/clarinet/oboe sound mass starts its ascent so the bassoon/trombone/double bass sound mass ceases (end of bar 21), although the bassoon continues for another bar playing a sustained A. The dynamics used on this note (crescendo from fff to sff), not only, indicates the eventual and violent end of the bassoon/trombone/double bass sound mass, but also, a structural significance, for it is unusual for a single note to warrant such prominence.

In bar 21 the horn plays three repetitions of  . This acts as an introduction to the trumpet solo which appears at the beginning of the next section (at bar 24), being the semitone F-E of the tone-semitone figure F-E-F#. The interval of a major 7th and the rhythm in the horn part in bar 23 is taken from the trombone part in bar 37 of the second movement. The major 7th then leads neatly into a restatement of the last two beats of the fugue subject. This is, not only, an appropriate way to round off this fugal section, but also, by picking out and isolating a particular part of the fugue subject, hints that this figure is going to be used as a basis for further ideas later in the movement.

SECTION 3: BARS 24-45

The section from bar 24-45 is split into two sub-sections; bars 24-39 and bars 40-45. There are two main facts which show that bars 24-45 form one complete section. Firstly, Varèse maintains the same tempo indication and metronome marking throughout, and in this movement, as in many others, the beginning of new sections is marked by a change of tempo. Secondly, the two subsections are united by the prominent use of material from the second movement. The subsection from bar 24-39, for instance, is a fuller and more complete version of the section from bar 50-66 in the second movement. The changes made to the version of this section which is played in the third movement are:

- 1) there is no change of chord in the accompaniment.
- 2) the solo melody, which in the second movement failed to develop beyond a repetition of the opening motive, is now given full expression and allowed to develop over the rhythmic accompaniment of the rest of the orchestra.

The similarities between the two versions are:

- 1) the metronome marking for this section ($\text{♩} = 132$) is exactly the same as that used for the corresponding passage in the second movement.
- 2) in the version in the third movement Varèse uses a $2\frac{1}{2}$ beat bar which is the only time in this movement that

a time signature with a half-beat is used; the only other time such time signatures have been used in Octandre is in the section from bar 50-66 of the second movement.

- 3) although the sequence of time signatures is different in the second and third movements the number of beats used in each section is too close to be coincidental. In the section from the second movement there are 47 beats whilst the section in the third movement contains $47\frac{1}{2}$ beats.

In the subsection from bar 24-39 of the third movement Varèse uses an eleven tone note-group (B-A). The missing tone, A \sharp , was a prominent note when played by the bassoon in bar 22, as mentioned earlier; this is another example of Varèse's technique of either preceding or succeeding a large full orchestral section by the dominant use of the tone which was omitted from the large section. The note group B-A is divided into two, some notes being used exclusively by the accompaniment and the remaining notes used only by the trumpet solo. The shared note-group indicates that there is a degree of unity between the trumpet and the rest of the orchestra, whilst at the same time they maintain a high level of independence because the two instrumental groups use different pitches within the note-group.

The subsection from bar 24-39 is also divided into two parts, the first part occupying bars 24-32 and the second part bars 33-39. In the first part the accompanying rhythm is made up from three basic elements. Firstly, there is the sustained note which starts on an off-beat; this appears in bars 24 and 26. This idea is then expanded into a syncopated rhythm, as seen in bars 27 and 29. Secondly, the $7 \text{ ♯ } 7 \text{ ♯ } \text{ ♯}$ rhythm, first heard in bar 25, is repeated exactly in bars 28 and 30 and finally dispersed into its two elements as the 7 ♯ appears in bar 31 and the ♯ in bar 32. The final element in this accompaniment is based on triplet quavers and is heard in bars 25, 28 and 30.

For the first part of this subsection (bars 24-32) the accompaniment tends to be rhythmically most active when the trumpet is playing a sustained note. Then at about the half-way point, the trumpet solo and the accompaniment are equally active, though the accompaniment's rhythm does start to disintegrate as the rests become more frequent. The notes used in the trumpet solo form the tone-semitone intervals which have been so important during this work. More than this, the solo is closely based on the trumpet solo at bar 33 of the first movement. The way the solo is now developed reveals a conflict between the tones G and E. The notes G and E are the notes of repose within the solo and the dominance of each note is directly proportional to its length. During this subsection the G gets shorter whilst the length of the E is increased, thus demonstrating its increasing dominance. The overall dominance of the E is also shown by the fact that during this subsection the E is held for a total of $14\frac{1}{2}$ beats and the G for a total of 12 beats.

The second part of this subsection starts at bar 33, where there is a dramatic change in the nature of the accompaniment. No longer are there constant changes of time signature; it remains in $\frac{2}{4}$ until bar 39. The rhythmic content of the accompaniment is restricted to repeated minims.

From bar 33 onwards the trumpet solo is totally dominant over the accompaniment and is much more active as the tone-semitone figure is repeated much more frequently; five times in seven bars as opposed to four times during the nine bars of the first part of this subsection. The crescendo from p to sf during each bar of the accompaniment is reminiscent of the accompanying chords played by the trumpet, trombone and double bass in bars 19 and 21 of the first movement. The end of the subsection is marked by a change in the dynamics of the accompaniment to $p \leftarrow f \rightarrow p$ and the trumpet finally settles on the F instead of the G or the E.

The final part of this section, bars 40-45, is a repeat of the section from bar 67 in the second movement. However, changes are made to the repeated version; Varèse never allows himself the luxury of an exact re-run

of any musical material. The whole passage is transposed up a tone and details in the instrumentation and chordal structures are altered.

There are five other changes that are made to this passage when it reappears in the final movement:

- 1) In bars 40-42 of the third movement the oboe plays what was the clarinet part in the corresponding passage in the second movement, and the bassoon plays what was previously played by the oboe.
- 2) The chord structure in bar 42 of the third movement is changed; it omits one note. Example 52 shows the extra note in the second semiquaver of the brass chord in the second movement. However, this note is played by the clarinet and double bass and held through to the end of bar 45. The unison playing of the clarinet and double bass are possibly a reference to the unison line played by the oboe and bassoon in bars 71-77 of the second movement.
- 3) In bar 43 of the final movement the oboe changes from playing the part that was previously played by the clarinet back to its original part. From this point on all instruments, apart from the piccolo and clarinet, revert to the instrumentation used in the second movement.
- 4) At bar 70 in the second movement the piccolo began a melodic line which was taken over by the clarinet, playing triplet crotchets, in the second half of the bar; at the equivalent moment in the third movement the piccolo plays the whole of the melodic line.
- 5) In the final movement, in bar 45, the trombone introduces an extra note (F \sharp) right at the end of the section. The reason for this change can be understood if we look at the construction of the first chord of the next section. Out of the three brass instruments playing the chord two of them, the horn and trombone, have just been playing immediately

prior to this chord. The horn's first note (Bb) is the same note that it played in the previous chord, and by changing the last trombone note of the previous section to an F# it, too, now plays the same note. By doing this, Varèse is able to maintain a sense of continuity between sections.

Notice that, although the rhythm of the oboe part in bar 45 of the third movement is identical to the corresponding part in the second movement, Varèse has written it differently. I believe he has done this because bar 45 is the last bar of the section and in it Varèse adds the violent crescendo to bring the music to an abrupt collapse, the syncopated rhythm of the oboe part, therefore, needs to be stronger, more incisive, than the dotted crotchet rhythm of the original. Because the dotted crotchet rhythm in the final movement is written as a crotchet tied to a quaver this rhythm appears to the player to be crisper, because he is more aware of the half-beat. Furthermore, the accent on the second quaver helps to reinforce the syncopation.

SECTION 4: BARS 46-60

The final section of the movement returns to the tempo of the fugal section (Anime et Jubilatoire; ♩ = 100). This is because this section is a coda in which the most important musical idea is based on material from part of the fugue subject. The "fugue" material is opposed by a sound mass which is formed by a reworking of the piccolo/clarinet sound mass which first appeared at the opening of the second movement.

The section contains three sound masses in all; the first of which is initially played by the brass instruments, but on occasions is expanded by the addition of the piccolo and clarinet. It is this sound mass which forms the basis of the final section and its connection with the fugue subject can be seen by comparing the subject with the trumpet part of the brass sound mass. (See Example 53) The first part of the brass sound mass

consists of two chords, it is the higher of the two chords which is by far the most dominant. The measure of its dominance is reflected by the fact that it is only the upper chord that is sustained for a reasonable length of time or is repeated. In fact, out of the 46 beats that make up the section from bar 46 to bar 56 the lower chord is sounded for a total of only 6.4 beats.

The second sound mass is played by the piccolo and clarinet and is based on the opening passage of the second movement. The piccolo uses the same grace note figure, transposed a semitone higher, and is accompanied by the clarinet sustained Ab, forming a major 7th clash with the piccolo sustained G. This clash is another reference to the opening of the second movement but the major 7th pedal point (Gb-F) is now played with the piccolo playing the high note. The piccolo and clarinet alternate between playing their own sound mass and joining the brass sound mass. This would seem to indicate a degree of association between the two sound masses, but, in fact, the only reason why the piccolo and clarinet do this is because none of the other instruments that are available could play the notes required for the brass sound mass. The sudden change of rhythm to triplet quavers, which, in this section, are only used when the piccolo and clarinet join the brass sound mass, and the change in style of melodic writing provide enough contrast to ensure that the two sound masses sound independent.

The third sound mass in this section is the minor 9th pedal point played by the bassoon and double bass which appears in bars 50, 53 and 54/55. This sound mass seems to be almost insignificant and to have no purpose in the structural development of this section, but, in fact, its function is to act as a foil to the conflict between piccolo/clarinet and brass sound masses. For example, the piccolo and clarinet play in rhythmic unison from the exact moment that the bassoon/double bass sound mass is first sounded. It is also used to fill some of the gaps between the brass/piccolo/clarinet triplet figures. Apart from its last appearance, the pedal


point always starts just after one of the triplet quaver figures and finishes immediately before the next. It is also used to enhance and accelerate the build up toward the introduction of the brass sextuplet figure in bar 56. This is achieved by initially using the pedal point after every other brass/piccolo/clarinet figure, but the rhythmic activity of the brass sound mass dramatically increases from bar 54 and the resulting increase in intensity is then fuelled by the unexpectedly early return of the bassoon/double bass pedal point.

The build up to the sextuplet figure is also accomplished by the use of two small details within the brass sound mass. Firstly, the extra independent semiquaver E that the trumpet suddenly introduces in the third beat of bar 56 and, secondly, the accented *sff* semiquaver played by all the brass instruments at the end of the same beat. Once the brass sound mass plays in a triplet rhythm on its own (in bar 55) its independence is sealed and it is then launched into the sextuplet figure at the end of bar 56. Notice the usual crescendo to an accented short note which marks the end of the piccolo/clarinet sound mass in bar 56.

The passage from bar 56-58 is constructed using an 11-tone note-group, omitting the tone G#. The G# is probably omitted because the clarinet made it such an important note during the last eleven bars. The sextuplet figure is constantly repeated from the end of bar 56 to the end of bar 58 where a change of chord at the beginning of bar 59 and the *sf p* when the piccolo, bassoon and double bass enter with the *fff* chord.

During the final two bars Varèse uses an 11-tone note-group (all tones except Eb) and within this note-group he creates three different sound masses. They are:

- 1) The brass sound mass which follows on immediately from the sextuplet figure and can, therefore, be seen as representing the status quo. This sound mass uses the three notes within the B-C#note-group.

- 2) The piccolo/bassoon/double bass sound mass provides immediate opposition to the brass sound mass and, until the trill is played by the piccolo, uses the notes E, F# and G (a possible reference to the tone-semitone idea). When the note-group E-G is completed, the piccolo trills to F and the third sound mass is introduced.
- 3) This sound mass is played by the clarinet and oboe and uses the note-group G#-Bb and D. The  rhythm, in general, and the clarinet part, in particular, give us the final reminder of the fugue (the clarinet part is, in fact, a repeat of the first two beats of the subject).

Example 54 shows how the piccolo/bassoon/double bass sound mass and the brass sound mass are laid out and how the gap between the two is filled by the clarinet/oboe sound mass.

Because the clarinet and oboe stop playing the fugue idea the notes D and Bb are now absent from the note-group, which means that the brass sound mass note-group is now isolated (See Example 54). This, therefore, indicates an antithesis between the brass sound mass and the rest of the orchestra. The resulting loss of contact between the two main instrumental groups leads to the demise of the piccolo/clarinet/oboe/bassoon/double bass sound mass. Now that the brass sound mass has broken free of the other sound mass it concludes the work by playing its strident chord 'pavillon en l'air'.

NOTES: CHAPTER THREE

1. Chou Wen-Chung, Sleeve notes: Varèse/Boulez: Ensemble Intercontemporain.
CBS. IM 39053. 1984.
2. From a lecture given by Varèse at Princeton University, 1959
'Rhythm, Form and Content.' quoted in Scharwz & Childs op.cit. p.

CHAPTER FOUR

INTÉGRALES (1924-1925)

After the experimentation of Hyperprism and the consolidation of new techniques in Octandre, Intégrales appears as a fitting climax to this period of development in Varèse's career - it is a summation of all those techniques that had found their first expression in the earlier works. This is not to suggest that they were merely experiments, it is just that, by comparison, Intégrales is more confident in the way the music accommodates Varèse's concepts. As Varèse himself said, 'I have always been an experimenter, but my experiments go into the wastepaper basket. I give only finished works to the public'.¹

What is, possibly, more important is the fact that, in writing Intégrales, Varèse developed a deeper realisation of the implications that were inherent in the techniques he had been consciously developing since Hyperprism. For example, although, with hindsight, we can see elements of a three-dimensional quality to his sound projections, it is not until Intégrales that Varèse, himself, had fully absorbed the significance of the musical language he had been creating.

'Intégrales' wrote Varèse 'was conceived for a spatial projection. I constructed the work to employ certain acoustical means which did not yet exist, but which I knew could be realised and would be used sooner or later. Whereas in our musical system we divide up quantities whose values are fixed, in the realisation I wanted, the values would have been continually changing in relation to a constant. In other words, it would have been like a series of variations, the changes resulting from slight alterations of a functions form or from the transposition of one function to another.'²

In Intégrales Varèse is bolder in his use of wind instruments; he begins to experiment with special sound effects, exercises a greater control over the orchestra and treats each instrument as one element within a music-making machine. In Hyperprism and Octandre the glissando was used as a way of producing pitch change independently of the tempered scale. In Intégrales this technique is developed in bar 152, where three trombones

play glissandi at the same time and in bars 191-192 and bar 193 even the oboe plays a portamento to achieve a similar effect. In bar 177 Varèse is very specific about the sound he requires, placing each group of instruments on a different level of aural awareness. He is also more particular about certain tone qualities he wants from individual instruments. The oboe in bar 184, for instance, is to play its solo A with a pinched reed so that it produces a soar sound. All these instructions to instrumentalists indicates Varèse's growing frustration with the limitations of these human-powered instruments.

The instrumentation of *Intégrales* also reflects a new-found confidence and maturity of style. The confidence is shown, not only, by the return of the percussion, after their absence in *Octandre*, but also, by the length of the piece - 224 bars - Varèse would not have written a piece of such length if he was at all uncertain about his compositional techniques.

The fact that 11-tone note-groups had by now become an important facet of Varèse's style, I am sure, led to the use of eleven wind instruments in *Intégrales*. It is significant that in this piece there are no full-orchestral chords with any of the instruments playing trills, as there was at the end of *Hyperprism*, where the piccolo had to trill on G in order to produce the Ab necessary to complete the 11-tone note-group. By using eleven wind instruments Varèse is also able to produce a more even spread of instrumental tone colour across the range. The addition of the contra-bass trombone extends the possible range of his orchestra to nearly seven octaves.

Varèse uses sixteen percussion instruments in *Intégrales*, the same number that were used in *Hyperprism*, except that, in *Intégrales*, he has organised the parts so that all the instruments can be played by four players, rather than the sixteen players required for *Hyperprism*. The way the instruments are used is much more organised, there is more careful attention paid to the structural significance of certain rhythmic figures and to the inter-play between percussion and wind. Also each instrument tends to have

specific characteristics, as listed below:

Snare drum - used mainly as a solo instrument, often used with tenor drum and/or suspended cymbal.

Tenor drum - rarely used as a solo instrument, often used in conjunction with the snare drum.

Bass drum - occasional use as solo instrument, often used with cymbal group.

Wire brush - rarely used; usually short, fill-in parts and not attached to any particular group of instruments.

String drum - only used once on its own, otherwise used with the cymbal group.

Castanets - used mainly as an independent voice, but also, with other instruments, especially snare and tenor drums.

Chinese blocks - usually solo instruments, often used with sleigh bells and less frequently with snare drum or tenor drum.

Tambourine - never used as solo instrument; always used in conjunction with snare or tenor drums, the only exception to this is at bar 85 when it is a soloist with the wire brush.

Chains - nearly always used with sleigh bells.

Sleigh bells - mostly used with castanets, but sometimes with chains.

Because of the length of the work the pitch organisation is a little less complex and tight than in Octandre; instead, Varèse concentrates on the structural relationships between and within the sections. *Intégrales*, like *Hyperprism* and *Octandre*, is divided into three parts, the first and the last parts are equal in length and the second part is half the length of the first. (See Example 1 which gives a concise guide to the structure of the work.) The final part, also, like *Hyperprism* and *Octandre*, is concerned, not only, with the development of its own material, but also, with the recapitulation of material from the first two parts of the work.

Another technique which helps to hold the structure of *Intégrales* together, is the use of pedal points which also act as pitch centres. Thus, we find that bars 1-52 are held together by a continuous Bb pedal point in bars 1-29 and by a continuous G pedal point in bars 32-52. The Bb pedal point is particularly important because it returns at various points during the work. It is often played by the same instrument so that it remains recognisable.

Varèse started writing *Intégrales* in 1924 while he was in Paris. It was completed in January 1925 and sent to Stokowski, who conducted the first performance on 1st March 1925 in the Aeolian Hall, New York, at a concert presented by the I.C.G. Appropriately *Intégrales* was, not only, the only work ever to be performed at two I.C.G. concerts (it was popular demand that led the I.C.G. to break their own rule which stated that a work should not receive more than one I.C.G. performance), but also, that *Intégrales* was the last work to be performed in the final I.C.G. concert which was held on 17th April 1927.


PART I: BARS 1-78

SECTION 1: BARS 1-29

The first section of *Intégrales*, like the whole work, is divided into three. The beginning of subsections 2 and 3 are marked by the trumpet solo and all three subsections are equal in length.

Subsection 1	bars 1- 9	lasts $39\frac{1}{2}$ beats.
subsection 2	bars 10-17	lasts $39\frac{1}{2}$ beats.
subsection 3	bars 18-24	lasts $40\frac{1}{2}$ beats.

The whole section (bars 1-29) is dominated by the repeated Bb pedal point, each statement of which is announced by the tritone grace notes. Although the pedal point remains distinct throughout the section it does undergo melodic embellishments and many changes in rhythm, dynamics and timbre. It is continually opposed by two separate but interdependent chords, one played by the high woodwind and the other by the trombones. The structure of the chords remain unchanged, only the rhythm and dynamics are varied.

The final element in this section is supplied by the percussion instruments which create a backdrop and brings a sense of unity to the structure by, for example, using rhythms taken from the wind parts; such as the $\gamma \text{ } \text{♪} \text{ } \gamma \text{ } \text{♪} \text{ } \gamma \text{ } \text{♪}$ in bar 8 is from the Eb clarinet part in bar 6 and the bass drum  is from the Eb clarinet part in bar 7. Despite the fact that there is variation within the pedal points, the wind parts on their own would make this section sound like a series of repeats of a compact unit, but the underlying and continual development of the percussion parts maintains a progressive momentum.

In their basic form, the three elements of the wind orchestra use similarly constructed, but separate, note-groups which, together, form the note-group Ab-E. (See Example 2) The three elements maintain this pattern of pitch organisation until the last five bars of the section.

SUBSECTION 1: BARS 1-9

The first two statements of the Bb pedal point show a gradual development

of its rhythmic content and the development, itself, initiates further growth. Firstly, by the addition of the percussion instruments, secondly, by the entry of the high woodwind chord and finally, the entry of the trombone chord. As the wind parts become more important the percussion parts fade into silence at the end of bar 5. The percussion returns, however, at the beginning of bar 6, as a result of the crescendo in the trombone chord. The figure played by the tenor drum always accompanies the wind and trombone chords in the first two subsections (bars 1-17). The rhythm in the Eb clarinet is a response to the reappearance of the percussion and, as the percussion get stronger, particularly the snare drum rhythm, the wind parts fade away. The pedal point starts again in bar 7 with a more active rhythm, based on the triplet quavers that were played by the pedal point in bar 4.

The next change of development - change of pitch - begins in bar 7, where the clarinet briefly changes from Bb to Ab. In bar 8 the change to Ab is more prolonged. It is during the clarinets' Ab that the high woodwind chord returns, followed by the trombone chord two beats later (the same gap between the chords in bar 5).

SUBSECTION 2: BARS 10-17

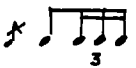
The change of pitch, that was started in bar 7, is developed further as the C trumpet, marking the beginning of subsection 2, alternates the pedal A# with the descending notes of a chromatic scale and, in so doing, adds the notes G and F# to extend the original note-group from Ab-E to F#-E. The 11-tone note-group is now complete, F# being the missing tone. The melodic expansion and the change of timbre creates an unusual effect in the woodwind and trombone chords as they alternate very quickly at the beginning of bar 11. The Eb clarinet immediately resumes playing the pedal point and all seems to return to normal as the woodwind and trombones, once again, play static chords. However, as a result of the upheaval caused by the trumpet solo, the trombones, for the first time, start playing their chord before the woodwind. The influence of the trumpets'

melodic expansion of the pedal point is also seen in the Eb clarinet pedal point, where, in bar 11, it adopts the descending melodic line and develops the syncopated rhythm found in the trumpet solo.

In bar 12 the pedal point is passed to the oboe which plays a version based on a compilation of elements from the Eb clarinet part in bar 7 and bar 8. (See Example 3) In bar 13 the snare drum plays the first definite and prominent rhythmic pattern played by the percussion. This causes the diminuendo and then the final crescendo of the oboe A#. As a result the development of the pedal point is halted and when the Eb clarinet restarts the pedal point it is in its original rhythmic form (note there is no change of pitch). Apart from the extra quaver played by the Eb clarinet and trombones at the end of bar 15, the wind parts in bars 14-15 and bars 16-17 are exactly the same. Although bars 14 and 15 are repeated by the woodwind and trombones, the percussion parts continue to develop and get more active. This continues after the snare drum solo in bar 13 as the percussion begins to get more prominent and, eventually, becomes equally important as the wind parts.

SUBSECTION 3: BARS 18-29

The first trumpet solo, at the beginning of subsection 2, was played with mute, but as a sign of continuing growth, the trumpet solo that marks the beginning of subsection 3 is played without mute and on the D trumpet instead of the C trumpet. The D trumpet solo in bar 18 is a rhythmically altered version of the trumpet solo in bar 10. (See Example 4)

The snare drum rhythm (), that interrupted the oboe's development in bar 13, is also played in bar 18, but is only played once, and fails to disrupt the trumpet part. The rhythm is then played again at the beginning of bar 19 and results in a change of timbre as the A# changes from the trumpet to the oboe. The rhythm returns once more on the last beat of bar 19, as the oboe, after a dramatic crescendo, stops playing, and the pedal point is returned to the trumpet at the beginning of bar 20. The sustained trumpet A# is accompanied by the suspended cymbal on the

third beat of bar 20 and as the trumpet gets quieter so, too, does the suspended cymbal. During the trumpet diminuendo the tam-tam and gong recreate the atmosphere of the opening, playing a similar fugue to that which was played in bar 4 and bar 5. Example 5 compares the two; notice the points of similarity: 1) the tam-tam starts before the gong, 2) that the gong plays one dynamic level above the tam tam and 3) that they both play laissez vibre.

The snare drum and tenor drum play a triplet semiquaver rhythm that derives from the snare drum part in bars 13, 18 and 19, but its shortened form in bar 21 shows the disintegration of the rhythm as an effective sound mass. Its demise marks a return to the Eb clarinet timbre of the Bb pedal point. The return of the Eb clarinet is accompanied by the return of the woodwind and trombone chords in bar 22 and 23, which are, in fact, a repeat of bars 16 and 17. This statement of the wind 2-bar unit differs greatly, in one particular respect, from all the previous statements, in that, instead of finishing with a diminuendo, it is concluded with a crescendo to fortissimo. The comma at the end of the bar, not only, indicates the violent end of the wind idea, but also, silences the percussion.

In the next bar the Eb clarinet restarts the Bb pedal point, but less confidently (mf instead of the previous f) and the comma after the first quaver indicates a degree of hesitancy. The woodwind chord answers the Eb clarinet as usual, but the trombone chord does not materialise, instead, the trumpets enter with a strident major 7th, the C trumpet playing an F (the tone that was omitted from the 11-tone note-group that has been used during the first 24 bars of the work). When the C trumpet F is sounded the Eb clarinet shifts from Bb to Db and marks the point at which the music finally breaks away from the hold of the Bb pedal point.

The balance that was previously achieved by the structure of the note-groups shown in Example 1 is now destroyed and during the next two bars the staggered entries of all the wind instruments fill the gaps and create a new balance that eventually results in the formation of two note-groups

that make up the chord, at bar 27, which uses the 11-tone note group Db-B (omitting C). Example 5 shows how the two note-groups are created. Although the dynamics used at the end of the chord show that all the instruments are united, the rhythmic independence in bar 27 clearly illustrates the division of the 11-tone note-group into two distinct parts - the Db-F note-group played by oboe, Eb clarinet, horn, D trumpet, C trumpet and the F#-B note-group played by piccolos, Bb clarinet and trombones. (See Example 6)

Bars 29-31 provide a percussion bridge passage which leads into the new section at bar 32. The percussion is used for this purpose because there has just been five bars of wind music with no percussion playing at all. The change in timbre creates a freshness of sound and leads to the expectancy of something new. The first appearance of the string drum enhances the feeling of expectancy, for its crescendo from p to sfff naturally leads the listener towards bar 32. Varèse uses the string drum in a similar way in *Hyperprism*. The string drum also adds strength and vigour to the percussion sound and sets the tone for the next section, where the percussion play a more aggressive and dominant role.

SECTION 2: BARS 32-52

The section from bar 32 to bar 52 is, essentially, a remodelling of bars 1-29, both sections share similar material and a similar construction of the layout. The first section is divided into three equal passages, the beginning of parts two and three being marked by the trumpet solo, playing an elaborated version of the pedal point, at bars 10 and 18. In the section bars 32-52 there are two roughly equal halves, the halfway point being marked by an elaborated version of the pedal point played by the horn solo (bars 44 and 45). The material in bars 32-52 is made up from five basic elements, the first four of which are common to both sections. I shall, therefore, deal with this passage by discussing the various elements within it, rather than analysing it bar by bar. The five elements used in this passage are:

- 1) Pedal point - Horn
- 2) Wind Chord - Piccolos, Oboe, Clarinets, Trumpets
- 3) Brass Chord - Bass and Contra Bass Trombones
- 4) Percussion
- 5) Trombone Solo

- 1) The pedal point in bars 32-52 is played by the horn and adopts a very similar form to the Eb clarinet pedal point in bars 1-29, except that the grace notes in the horn part are written out in full. (See Example 7)
- 7) The horn pedal point is transposed down a minor 3rd, this may well be to balance the shift up a minor 3rd that was made by the Eb clarinet when the pedal point finally broke down in bar 25. The horn pedal point is played twice before the entry of the wind chord just on the Eb clarinet pedal point at the very beginning of the work was played twice before the entry of the high woodwind chord.

The pitch organisation of the decorated version of the pedal point at bars 44 and 45 is identical to that used by the trumpet solo in bar 10 (See Example 8). The horn pedal point is also varied from statement to statement in a similar fashion to the Eb clarinet pedal point. For instance, at bar 47, after the decorated statement of the pedal point in bar 44 and 45, the horn returns to express the pedal point in its simplest form, in much the same way that the Eb clarinet returned to an elemental form of the pedal point (rhythm only) in the latter part of the first section (bars 14-24).

- 2) The wind chord in the second section fulfills the same function as the high woodwind chord (played by piccolos and clarinets) in the first section; i.e. to complete statements of the pedal point. The wind chord of the second section is different from that in the first section in that it contains more notes and is rhythmically developed, particularly by the use of staggered entries. Another change is made by the addition of the two trumpet notes (A-G#major 7th) whose interval is based on the F-E major 7th that was added to the high woodwind

chord in bar 25 and led to the termination of the first section.

The association of the two is developed in this section whilst the previously close link between the high woodwind chord and the trombone chord is abandoned.

There are three types of wind chord used in the second section and all contain three basic elements; woodwind chord, brass chord and trombone solo. The first three chords heard in this section illustrate the three types; the chord at bar 36 is Type-1, the chord at bar 38 is Type-2 and the chord at bar 40 is Type-3. The structural layout of the chords is as shown in Example 9.

In the first section there was no straight forward layout of the woodwind chords within each third of the section but in the second section the tighter organisation of the structure is shown by the balance that results from placing four wind chords in each half of the section.

Notice that the last three chords in this section (at bar 48, 50 and 52) are identical, a characteristic which is shown by the first section as the chords at bar 14, 16 and 22 were also identical. The Type-2 chord at bar 38 is only played once and appears to be a bit of an oddity, a fact that Varèse underlines by his use of the percussion. The crash cymbal and the gong are used to accompany all the chord-types throughout the section but, significantly, the suspended cymbal accompanies all wind chords except that of bar 38 - the Type-2 chord.

- 3) The brass chord is still used in section two, but as an accompaniment to the pedal point rather than as an independent musical idea. However, the connection between the brass chord of the first section and the brass chord of the second section is still very clear. For instance, the dynamics used at the beginning of each statement of the brass chord in section two are identical to the dynamics used at the beginning of the brass chord in bar 5 and bar 9 (sf p \longleftarrow f). The chord, however, is modified and now consists of two notes (F# and C) instead of three though the low F# forms a minor 9th with the horn G and, therefore,


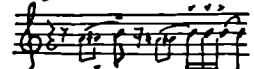
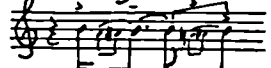
the essential character of the low brass chord from the first section is retained. In fact, what Varèse has done is to combine the two separate elements of pedal point and low brass chord into a single idea.

4) The writing for the percussion in the second section is much more vivid and tightly controlled than it was in the first section. It is as though the wind instruments provided the substance of the music in the first section and the percussion was merely adding decorative rhythm to maintain momentum and to supply a backdrop to enhance the sense of unity. Most of the percussion now have a specific function within the structure and generally follow the plan laid down by the wind instruments. For example:

- 1) throughout the section the bass and contra-bass trombones' pedal point is accompanied by the tam-tam.
- 2) the chinese blocks solo always coincides with the horn solo.
- 3) after the half-way point (bar 47) the sleigh bells accompany the Chinese blocks.
- 4) the crash cymbal and the gong accompany all the wind chords.
- 4a) the suspended cymbal accompanies all wind chords except at bar 38.
- 5) the bass drum accompanies the horn solo in the first half of the section and in the second half plays ff for the horn solo and pp for the wind chord.

There are three ways in which the percussion instruments are used in this section. Firstly, there are instruments that play a purely accompanying role to a wind instrument or group of wind instruments. Secondly, there are instruments that play independent material but always at the same time as a specific event in the wind parts. Thirdly, there are the percussion instruments that play totally independent rhythms at times that are unrelated to any structural exigencies determined by the wind instruments. Under the first category only percussion instruments that can sustain a sound are used, they include; Suspended Cymbal, Gong Tam-Tam, Crash Cymbal and Bass Drum. The Chinese Blocks and Sleigh Bells

(in the second half of the section only) come under the second category. The third category consists entirely of purely rhythmic percussion instruments; Snare Drum, Tenor Drum and Sleigh Bells (in the first half only).

- 5) The fifth element, the tenor trombone solo, is a new idea added to the four already dealt with to give the feeling that the music is continually developing, it helps to give the music a push forward. The solo consists entirely of a series of rhythmically repeated and ornamented B's played in short bursts varying in length from two to three beats. There are three types of solo, each corresponds to one of the three types of wind chord. When the Type-1 wind chord is played the trombone solo plays , when the Type-2 wind chord is played the trombone plays  and for the Type-3 wind chord the trombone plays . Notice that each type gets successively shorter; Type-1 = 3 beats, Type-2 = $2\frac{1}{2}$ beats and Type 3 = 2 beats. The style of writing for the instrument, with its central, rhythmically articulated, note punctuated by glissandi, is similar to that used for the trombone solo in bar 16 of the second movement of Octandre and, to a lesser degree, the opening of Hyperprism.

The quintuplet semiquaver rhythm found in the first type of trombone solo develops into an important structural feature in this section. It is played first by the tenor trombone in bars 36 and 43, it is then played by the horn in its elaborated pedal point in bars 44 and 45, passed on to the Chinese blocks in bar 47 and back to the trombone in bar 48. From then on both instruments play the rhythm in alternate bars until the end of the section.


CODA: BARS 53-78

The passage from bar 53-78 acts as a coda to the first major section of Integrales. The construction of the coda shows an elegant proportional balance of sections within the passage which is based on the Fibonacci Series (beloved of such twentieth century composers as Bartok). The

Fibonacci Series is created by starting with two identical numbers, these are added to give the third number in the series, then the second and third numbers are added to give the fourth and so on. The coda is divided into two main sections; bars 53-69 and bars 71-78, with a bar's silence in between the two. The two halves are already very different from each other, but the bar's silence helps to completely destroy any sense of continuity between the two subsections. Bars 53-69 is also split into two equal halves (bars 53-62 and bars 63-69), but within this passage there is a sense of continual development, as one half leads into the next. When the timings for each of these sections is calculated (taking a crotchet beat = 112 at bar 53) an extraordinary balance between the sections emerges which corresponds to the properties of the Fibonacci Series. Example 10 shows that bars 53-62 is exactly equal to bars 63-69 and that these two sections together equal the length of section bars 71-78. In other words the first two sections added together give the value of the third, just as the first two numbers in the Fibonacci Series are added to give the third number (in this case it is the equivalent of 1.1.2).

The first bar of the new section contains material based on the previous section, this creates an overlap and smooths the join into the new idea. The bass and contra-bass trombones continue their pedal point exactly the same as in the previous section and the horn plays triplet quavers instead of semiquavers and only plays the B and the F, but this idea is clearly derived from its pedal point in bars 32-52. The percussion instruments accompany the brass and the entries of each of the instruments coincides exactly with the rhythm of the trombone and horn parts.

The new idea, played by clarinets and trumpets, starts with a Bb on Eb clarinet and C trumpet and, thereby, indicates the temporary return of the Bb as a pitch centre. The orchestration makes this return clearer because it was the Eb clarinet that was most closely associated with the Bb pedal point in the first section. After the Bb, the C trumpet outlines a fan-

fare-like idea  and each of the notes played, apart from

the A, is sustained by one of the other instruments. The tones used in this new idea do not form a complete note-group, but they are deliberately chosen to avoid the notes used by the horn and trombone parts in bar 53. (See Example 11) However, with the exception of the G, the two groups play all the tones from D \sharp -C; by omitting the G, Varèse emphasises the demise of the horn pedal point.

The listener, at this point, is taken back to the first section of the work, not only, because of the return of the clarinet Bb, but also because the structure of its accompanying chord is reminiscent of the trombone chord in bar 5. The only difference between the two chords is that the chord in bar 54 outlines a major 7th instead of the minor 9th used in bar 5. During bar 54, as the Bb pitch centre is re-established, the trombone and horn chord is terminated by the usual crescendo to an accented, tied semiquaver. The trumpet idea is played three times, in all, and at bar 60 it begins to break up, as the second statement only lasts one bar. To make this break up clearer Varèse changes the details of articulation on the C trumpet part by adding an accent to the quaver D \sharp and by putting a comma at the end of the note. The idea is restarted; the C trumpet resumes playing the figure with its original articulation, but the Bb clarinet, playing the Bb pitch centre, finishes early and the whole idea collapses. It is as though the idea was entirely dependent upon the Bb pitch centre for its existence.

The second half of the first section of this coda begins with the D trumpet and bass trombone using notes that are based on the structure of the lower three notes of the chord which was played in the first half of this section. (See Example 12) If the G in the second chord is transposed up an octave, then the chord consists of a major 7th with a major 3rd at the top, which is a reworking of the earlier chord, which consisted of a major 7th with a major 3rd at the bottom of the chord. This connection has not more significance than the fact that it provides a method of structuring a chord to form a subtle link into the new section.

The D trumpet and bass trombone settle on A and G \sharp and the resulting minor

9th acts as a pitch centre for the first half of this passage. Around this centre Varèse weaves three sound masses:

- 1) the C trumpet E-D \sharp , which is a continuation of material from bars 54-62; the emphasis is on the D \sharp (the note that it held in the chord in the previous passage) and is all that remains of the previous section.
- 2) the oboe/Eb clarinet/horn sound mass contains a mixture of new and old material; the oboe and Eb clarinet play the new material in unison, while the horn, although rhythmically in unison with the oboe and Eb clarinet, alternates from F-G, thereby continuing the conflict between the G (from the horn pedal point in bars 32-52) and the F (the note on which the horn finally settled in bars 36-52).
- 3) the tenor trombone alternating between B-D in this part is reminiscent of the tenor trombone in the section from bars 36-51.

In bar 65 the D trumpet introduces a Bb which alternates with the sustained A. This upsets the equilibrium and all the other sound masses now begin to change. Firstly, the rhythm of all sound masses, the bass trombone sound mass excepted, is altered; the oboe/Eb clarinet/horn changes from demi-semiquaver to triplet-quaver speed and then slows down even more to quavers, at which point they change note (to G) at the beginning of bar 66, an event which signals the collapse of the idea. As the oboe and Eb clarinet falter, the horn breaks away from the sound mass and joins a newly emerging brass sound mass.

Secondly, the C trumpet rhythm changes to semiquavers and, from bars 65-67, stays on D \sharp , thereby aligning itself with the other brass instruments.

Thirdly, the tenor trombone starts to alternate rapidly between the B and D before finally settling on the D and also becoming part of the brass sound mass.

From bar 66-69 there is a gradual move by the brass instruments toward the F-Bb note-group, which forms the final chord of this section. (See Example 13) At the beginning of bar 66 the bass trombone, as a result of the D trumpet alternation between the A and Bb, breaks away from the A of the D trumpet and takes over the C# from the oboe/Eb clarinet/horn sound mass. The horn takes over the bass trombone G# at the beginning of bar 66, but the change of timbre results in the D trumpet alternating between A, Bb and C. As the bass trombone plays an A in the second half of bar 66, the D trumpet settles on a G# and, thereby, joins the mainstream of the brass sound mass. At the beginning of bar 67 all the brass instruments have settled on a static chord. It is at this point that the contra-bass trombone enters with an idea that is reminiscent of the horn pedal point, the triplet quavers being the equivalent of the grace notes and the syncopated F# having the same rhythm that was used by the horn pedal points in bars 37 and 39.

In bar 68 the C trumpet extends its major 7th (E-D#) to a minor 9th to settle on an F and as it does so, it brings itself into the final brass note-group. In bar 69 the tenor trombone takes over the C trumpet D# and then completes the F-Bb note-group by playing a G. The trombone part of this chord is based on the structure of the trombone chord in bar 5, except that the major 3rd is changed to a minor 3rd.

The construction of the second half is based on three note-groups which are used by four different sound masses that gradually merge to form a full chord (in bars 77 and 78) to complete the coda. The sound masses are:

Note-Groups		
1) Piccolos	}	Bb-Db
2) Clarinets		
3) Trumpets and horn		G - A
4) Tenor and bass trombones		D - F

All four sound masses combine to form the note-group G-F (Gb being the missing tone). The opening of the second half of the coda marks the return

of the percussion instruments but although they do play independent parts, they are entirely subservient to the wind parts. The percussion ceases to play altogether, when the third sound mass enters.

The first three sound masses show no melodic movement and, therefore, it is only rhythmic and dynamic independence which separates them. As each sound mass enters it gradually builds up the sound and makes the music move on to the climax of the passage at the final chord. Example 14 shows how the trombones' note-group (D-F) is separate from the woodwind note-group and how the introduction of pitch movement (in bar 76) de-stabilises the balance between the sound masses and leads to their eventual breakdown. During the third beat of bar 77 there is a lot of octave-displacement and note-swapping. The C trumpet plays its G# an octave lower, then it plays the D trumpets A an octave lower. The D trumpet starts on its normal note and changes to the C trumpets' G# played an octave higher. The Eb clarinet changes from its usual note to a Gb (which was the missing tone from bar 71-77). It is the introduction of the missing tone that, once more, produces a violent reaction; for it is this step which immediately precedes the full chord. The unity of the chord is shown by the unison rhythm and dynamics (the two parameters which, up until now, have been used to distinguish one sound mass from another). The only division within the chord occurs when the brass drop to a sudden piano in the middle of bar 78, they then flutter-tongue and crescendo, but complete the chord in unison with the woodwind. The separation of the brass from the woodwind is also shown by the use of note-groups; the woodwind use the note-group E-G# from within the complete note-group (D-C) that is used by the whole chord. (See Example 15) The top three notes of the chord, like the brass chord in bar 5, form a minor 9th and a major 3rd, although in this case the major 3rd is at the top of the chord.

Once more Varèse finishes a section with all the instruments playing a crescendo to a sfff tied semiquaver.

PART II: BARS 79-154

The central section of *Intégrales* is characterised by short, contrasting passages which have the effect of increasing the pace of the work; this is especially effective after the almost static nature of the first two sections in Part I. Bars 79-154 is in a kind of cyclic form (See Example 1), the purpose of which is to highlight the central section "D", which is, not only, the centre-point of this movement, but also, the centre-point of the whole work.

The pedal point A is prominent in this part and, therefore, shows a modulation away from the Bb pitch centre which dominated the first part.

SECTION "A": BARS 79-92

Metrically, Section "A" is divided into two equal halves, each half having two identical sequences of time signatures. Within each half Varèse places two trombone chords which occur at the same point, during the $\frac{3}{8}$ and $\frac{3}{4}$ bars (shown in Example 16). This is, however, not an indication that Varèse merely repeats the first section, for the percussion and highwind chord develop independently of this structure.

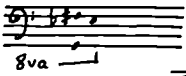

The percussion, generally play parts that are totally independent of the wind orchestra, though, on occasions, the snare drum, tambourine (bar 82) and crash cymbal (bar 89) are used to accompany the trombone chords.

The wind parts consist of three sound masses:

- 1) the clarinets playing the notes A and B, which are the same notes played by the piccolos in the high woodwind chords in bars 1-29.
This sound mass is closely associated with
- 2) the horn and trumpets' sound mass which uses the note-group G#-Bb. Because the note-groups of these two sound masses overlap, their independence is expressed by rhythmic differences, particularly the staggered entries.
- 3) the third sound mass, played by the trombone, is clearly opposed to sound masses 1 and 2. The difference is expressed, not only,

by the use of different pitches (the trombone sound mass uses the note-group D-F#), but by the fact that it always plays in a gap left by sound masses 1 and 2 and, also, by the use of different parts of the register (there is an octave and a 4th between the trombones' sound mass and the lowest note of the trumpets' sound mass).

Example 17 shows the distribution of pitches in the three sound masses. Note that each group of sound masses doubles one of the tones.

The chords played by the trombones are loosely based on the structure of the trombone chords in bar 5. The first chord  contains a major 7th with a minor 3rd at the top and the second chord  contains a major 9th with a minor 3rd at the bottom.

After the dominance of the wind instruments in the last section (bars 53-78) Varèse ensures contrast by starting this section with the string drum crescendo accompanied by the bass drum. (The string drum was also used to introduce the new section beginning at bar 32). The crescendo leads to the ff tam-tam entry and only after this do the wind instruments start playing. The clarinet sound mass enters first, as it does throughout this section, and remains independent because of the use of a diminuendo to mp followed by a crescendo to sfff in bar 81, whereas the trumpets' sound mass stays on a constant dynamic level. In bar 83 the clarinet sound mass and the horn/trumpet sound mass, once more, start with independent rhythms, but, this time, their use of dynamics is unified (the clarinet fff being equal to the brass ff) and from the moment both sound masses play flutter-tongued notes they act as a single sound mass. The clarinet and horn/trumpet sound masses remain united from bars 85-88 alternating between increased rhythm activity and long sustained chords (during which, the percussion instruments become very active).

Although the trombone chord is repeated in exactly the same point within the time signature sequence, it is changed, in bars 89-90, by the addition

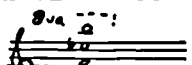
of one extra beat on the first chord. Also, the wind chords enter relatively earlier than they did in the first half. Once more, the clarinet sound mass starts first, but by the end of bar 90 they are reunited with the horn and trumpets, but, because of the entry of the string drum, both sound masses start to break up. The section ends when the horn/trumpet sound mass stops playing in bar 92 and the clarinets fail to survive on their own.

SECTION "B": BARS 93-100

This section is similar in style to bars 31-39 in Hyperprism. Both passages are played on brass instruments, both have a melody played by the horn and accompanied by melodically static but rhythmically active chords and the percussion in both instances is used to accompany the rhythm of the brass parts.

In *Intégrales* the cymbals and bass drum play in unison with the accompanying brass instruments, except in the first two beats in bar 96 and bar 97, where the gong and crash cymbal take over and the tenor drum part is added. In bar 98 the percussion parts revert to the arrangement used in bars 93-95. In bar 94 the tam-tam and crash cymbal accompany the brass minim and when the same rhythm returns in bar 98 the tam-tam fulfills the same function, but this time paired with the tenor drum and not the crash cymbal.

The brass melody is played in unison by the horn and C trumpet, with the D trumpet punctuating every accented note with a short sfff quaver (except in bar 99 where it plays full-length accented notes). No formal note-groups are used in this section, but the melody and the accompanying chord do use separate pitches. (See Example 18)

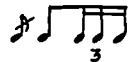
Up to this point in *Intégrales* the structure of the trombone chord in bar 5 has been used as the basis for the construction of many chords, but in this section the construction of the accompanying trombone chord is based on the structure of the high woodwind chord in bar 5. The high woodwind chord consisted of three notes which created two 5th's either side of the central note.  The same idea is used for the trombone chord

except that the interval either side of the central note is a perfect 5th.





There are no clear structural divisions within this section. The melody revolves around the central D until the F# is played in bar 99, this, being a strange note to the melody, causes the section to close in an unusually unspectacular fashion.

SECTION "C": BARS 101-121

The first four bars of this section act as an introduction and all the material used is based on music from bars 1-29. The oboe solo, for instance, is similar to the pedal points from earlier in the work. The Eb is obviously the pedal point itself and the B and D triplet quavers correspond to the grace notes played before the pedal point in bars 1-29 and bars 32-52. The piccolo minor 9th pedal point uses exactly the same notes (E and F) as it played in the wind chord throughout the section bars 32-52. Just as the high woodwind chord (in bars 1-29) was answered by the trombone chord so, too, in bar 102, the trombones answer the piccolos. In this case the trombone chord, though consisting of only two notes (F# and G) does form the minor 9th which was the distinctive characteristic of the trombone chord played from bar 5 to bar 29. Interestingly the notes used for this minor 9th recall the two-note trombone chord in bars 32-52, where the lower note was F# and the horn pedal point above that chord was on a G. In the gap between the woodwind and brass chords the percussions are prominent, playing material which also originates from bars 1-29 ( comes from the snare drum rhythm played at bars 13, 18 and 19) where it also played at the same time as unaccompanied pedal points.

At bar 105 the D trumpet A returns, this time it is rhythmically articulated and continues as the pitch centre for this passage until bar 119. Up to bar 116 all the D trumpet A's are based on one of two basic rhythms:

1)  2)  Both types start with four semiquavers, though they sound different because one starts on the beat and the other on the off-beat. The D trumpet throughout this



section is always accompanied by the C trumpet and tenor trombone who play the E and F, inverted to a major 7th, transferred from the piccolos.

In bar 106 a new idea is introduced by the piccolos, oboe, clarinets, horn and bass trombone. It consists of two alternating chords played in a similar fashion to bars 22-24 in the first movement of Octandre. The 1st piccolo doubles with Eb clarinet in octaves and the 2nd piccolo doubles with Bb clarinet, also in octaves. The first chord is made up from the note-group Bb-D and the second chord uses the note groups D-Eb and Gb-Ab. The gaps between these groups are filled by the notes A, F and E played by the D trumpet and C trumpet/tenor trombone chord. It is the second chord which proves to be the dominant chord, it is played for a total of $24\frac{1}{2}$ beats during this section, whilst the lower chord is only played for a total of $3\frac{1}{4}$ beats.

After the introduction the percussion instruments act entirely as an accompaniment to the trumpets and tenor trombone sound mass. Just as the accented notes of the melody in section "B" were emphasised by the addition of the D trumpet so, in this section, the accented notes in the D trumpet pedal A are reinforced by percussion instruments. In each statement of the pedal A the rhythm (up to bar 116) consists of two accented notes, the first is always accompanied by the snare drum, cymbals and triangle and the second is always accompanied by the suspended cymbal, cymbals and triangle. The C trumpet and tenor trombone chord, which supports the D trumpet, is accented at the beginning of each playing of the chord and this accent is reinforced by the addition of, either, the gong or the tam-tam. (There are two exceptions to this, one at bar 110, where the D trumpet A is not rhythmically articulated and at bar 114 where the chord is played concurrently with the woodwind chord.)

Once the two sound masses are established they continue alternating with no sign of any change or development until bar 110, where the trumpet/tenor trombone sound mass restarts before the woodwind sound mass has finished.

This results in the D trumpet playing a sustained A with no rhythmic articulation, the percussion accompaniment changes (the cymbals do not play at all and the snare drum and crash cymbal sustain their sound as there is no second accent in the D trumpet part). The C trumpet and tenor trombone are accompanied by the tam-tam instead of the gong and, finally, the woodwind sound mass re-enters very quickly. Things are temporarily restored to normal in the next bar, apart from the snare drum playing half a beat later than usual, thereby not coinciding, as is usual, with the D trumpets' accent.

From this point on the two sound masses are beginning the process of overlapping each other. In bar 114 the trumpet/tenor trombone sound mass plays while the woodwind sound mass sustains its chord and the bass drum joins the tam-tam in accompanying the C trumpet and trombone chord. The bass drum then develops its own part and the crescendo it starts is taken up by the suspended cymbal. It is these last two changes, the wind overlapping and the changes in the percussion accompaniment, that brings about the eventual demise of the woodwind sound mass, which in turn results in a change of tempo and the percussion ceasing to play. The trumpets and tenor trombone continue for a while, but the D trumpet plays a different rhythm on its sustained A, whilst the bass and contra-bass trombones G-F# major 7th returns to accompany it. When the bass and contra-bass trombones return they use a similar technique to that used in bar 76 by the tenor and bass trombone. (See Example 19) Both chords settle on a sustained major 7th, which, in bar 76 is preceded by a minor 9th and in bar 117/118 by a minor 2nd (the inversion of a minor 9th). In the second half of bar 118 the trombones use a rhythm based on the woodwind sound mass in the first part of this section. Varèse has taken the  rhythm used in bars 106-116 and reversed it. 

The octave displacement of the bass and contra-bass trombones in bar 119 is the first indication of movement towards new material, the second indication is the cessation of the C trumpet and tenor trombone chord.

At this point the Eb clarinet plays a prominent Bb which starts the build up of a woodwind chord similar in style to those played in bars 32-52. The continuation of the Bb by the oboe results in the demise of the D trumpet A and the bass and contra-bass trombones change chord to the E-F minor 9th, continuing a process that was started in bar 105, where the C trumpet and tenor trombone took the E-F minor 9th from the piccolos and inverted it to a major 7th which was sustained through to bar 119 where the bass and contra-bass trombones took it even lower and inverted it again to its original form. The process is completed when the clarinets once more invert it to a major 7th at the beginning of bar 121. The climax of the section is reached on the addition of a new sound mass played by the horn and tenor trombone, who reintroduce the A/Bb conflict.

The section is completed, in bar 121, by the oboe and clarinets, an instrumental combination that is reformed at the end of section "D", at bar 126, to introduce the woodwind chord. On the third beat of bar 121 the oboe and clarinets settle on a chord based on the structure of the trombone chord from bar 5, consisting of a minor 9th and a major 3rd at the top of the chord; exactly the same structure used by the trombones in bar 126, at the end of this section.

SECTION "D": BARS 121-130

Section "D" is the central point of the whole work and the bulk of this section, bars 121-125, consists entirely of brass instruments producing a full, rich and strong sound. The first half of the section is homophonic, the parts oscillating, in rhythmic variation, around three chords. Together, the three chords use all 12-tones. (See Example 20)

The homophony begins to break down half-way through bar 123, where, after the comma, the bass and contra-bass trombones play semiquavers. At this point the tenor trombone stops playing and when it re-enters it increases the polyphonic nature of the music. This leads towards the first entrance of the D trumpet, becomes very soloistic and transforms the other brass instruments into accompanists.

Although the music is now polyphonic, there are, in bars 124 and 125, traces of the original homophonic chords in the texture. Example 21 shows the chords used in bars 124 and 125; the numbers refer to the chord-type as shown above. The D trumpet soars ever higher towards the climax of this section at the final chord where the brass are joined by all the woodwind. The final chord contains 11-tones, D being the missing note. On the second beat of bar 126 the bass trombone shifts from the C to the Eb, thereby, forming a chord based on the structure of the trombone chord of bar 5, with a minor 9th and a major 3rd at the top of the chord.

The build up to the woodwind chord takes part in three stages: 1) the preliminary semiquaver chord, played by oboe and clarinets, 2) the sustained oboe/clarinet chord, 3) the piccolos join to form the final chord. In stage 1 Varèse is preparing notes that appear in the final chord, but all three notes change instrument and register, as shown in Example 22. The top three notes of this final chord create a balance with the trombone part of the chord, by basing its construction on the trombone chord from bar 93. As already mentioned, this chord consisted of three notes which formed to equal intervals (perfect 5th's) either side of the central note.

Section "D" is rounded off with a four-bar transitional passage, where the two elements of the final chord, woodwind and brass, unite as the Bb clarinet and the horn play a sustained D (the note that was omitted from the final chord). The horn and clarinet are accompanied by the tenor drum which displays a degree of independence by playing rapid crescendos and diminuendos.

The clarinet and horn D also acts as an introduction to the next section, which is based on Section "B", where the melody was based around the pitch-centre D. This also explains why the horn D in bars 127 and 128 fades away, for in Section "B" the horn shared the melody with the C trumpet, but in the return of Section "B" a clarinet shares the melody with the C trumpet, therefore, the sustained D in bars 126-129 can be interpreted as a struggle for supremacy between the clarinet and horn for the

right to play the melody in the next section. As the horn stops playing, the clarinet proves its dominance and the Eb clarinet, therefore, shares the melody with the C trumpet.

SECTION "B": BARS 131-134

As expected, Varèse does not repeat Section "B", or even some of it, in an exact form, but takes various parts and recreates the essence of the original. In bars 131-134 the C trumpet shares the melody with the Eb clarinet instead of the horn and the accented notes that were punctuated by the D trumpet, are now punctuated by the Bb clarinet. The rest of the instrumentation is the same, except that the tam-tam and crash cymbal no longer accompany the minims in the trombone chords.

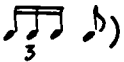
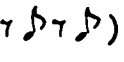
The melody is based on two separate parts from the original; the first bar is taken from bar 98, whilst bars 132-133 are taken from bar 94. The trombone accompaniment in bar 131 is loosely based on the accompaniment in bar 95, and bar 132 is based on bar 94. In bar 134 the trombone accompaniment does not follow the rhythm of the melody as it did in the corresponding place in bar 99, because of the change that is about to take place. Just as the F# caused the demise of this idea in bar 100, so it signals the end of its recapitulation; also, the introduction of a new accompanying percussion figure at the beginning of bar 134 helps to destroy the recapitulatory nature of this section and, therefore, destroys its purpose. However, at the very end of the recapitulation, the D trumpet takes over the Eb clarinet part and the horn takes over from the C trumpet, so that this section is concluded with something near to the original orchestration. As soon as this happens, though, fresh material is introduced, which, combined with a new chord in the trombone parts, acts as a link to the next section beginning at bar 135.

SECTION "A": BARS 135-143

The connection between Section "A" and its so-called "recapitulation" is much less clear than the recapitulations of the other two sections; but there are many characteristics from the original Section "A" to help link

the two.

- 1) Both sections have the same metronome setting of ♩ = 160.
- 2) The chord played by the trombones has the same structure as the trombone chord played in bar 82, but is played a semitone higher in bars 135-143.
- 3) The trombone chord is opposed by a high wind chord in both sections.
- 4) The percussion material, perhaps more than anything else, gives more clues to the link between the two passages.

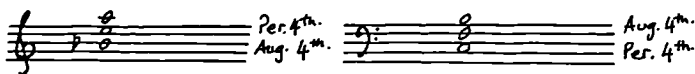
The string drum crescendo in bar 140 is used in bars 79-80, the castanet rhythm () in bar 138 is also played in bar 88, and the cymbals' rhythm () in bar 142 is also played in bar 80. The last off-beat note in the section, at bar 143, played on the cymbals, is the same rhythm that is played by the gong right at the end of the original Section "A" and the triplet semiquavers precede this off-beat quaver in bar 143 as well as bar 194. It seems, therefore, that as this off-beat quaver coincides with a wind chord, that the percussion was taken as the main basis of recapitulation and the wind parts adjusted as necessary, for there are other similar examples elsewhere in this section. For example, the constant rhythm in bar 138, which is taken from the original, is followed by the woodwind instruments; the off-beat quavers in bars 141-142, again based on material from the original, are "accompanied" by the wind instruments.

SECTION "C": BARS 144-154

In the recapitulation of Section "C" the horn takes the tenor trombone part, but plays Bb instead of F; this is done because of the structure required for the chord at the end of this passage, at bar 153. The horn, D trumpet and C trumpet combine both elements that were present in the section bars 105-121; the trumpet/tenor trombone chord and the semiquaver sound mass played by the woodwind/horn and contra-bass trombone. In bars 144-148 the trumpets and horn play the trumpet/tenor trombone sound mass from bars 108-110, except that, in bar 148, the rhythmic content of the D trumpet part and C trumpet/tenor trombone parts are interchanged i.e. the trumpet A

is on the beat and the accompaniment is off the beat in bar 148, whilst in bar 110 the trumpet A was off the beat and the accompaniment on the beat.

In bar 149 the alternating wind chords idea, from bar 106, is incorporated into the trumpet/tenor trombone sound mass. The D trumpet joins the C trumpet E on the first two beats of the bar, then during the last two beats of the bar all the instruments play fourths, in semiquavers, in a similar manner to Section "C". In bar 150 the sound mass returns to its original form, as the D trumpet plays the rhythm found in bar 105. In bar 151 the trumpets and horn play a repeat of bar 148 and half-way through the bar the trombones introduce a chord whose structure is an inversion of the chord played by the trumpets and horn



In bar 152 the trombones change, via glissandi, to a chord which is an exact repeat of the structure of the trombone chord from bar 5. This chord is in preparation for the chord in bar 154 and the crescendo of the trombones is assisted by the percussion. The trumpets and horn continue to play the same notes they have been playing for the whole of this section, which explains why the horn note was changed at the beginning of this passage. The piccolos complete the chord by leading into it with grace notes that imitate the trombones' glissandi. The chord contains 11 different notes, F being the missing tone.

PART III: BARS 155-224

Part III of *Intégrales* is largely constructed from a recurrent oboe theme interspersed with recapitulations of material that originated from earlier in the work. The immediate impression when listening to this section is that it has no clear form or subdivisions; this is intended, and produces a smooth progression as a contrast to the previous section, where the juxtaposition of a series of short blocks of sound was all too apparent. However, Part III, is, in fact, carefully structured and is subdivided in the following manner:

Section 1:	bars 155-160	Percussion interlude	
Section 2:	bars 161-190	= 108.5 secs.	
Section 3:	bars 191-200	= 42.8 secs.) 107.6 secs.
Section 4:	bars 201-224	= 64.8 secs.	

Sections 2-4 each start with an oboe solo, the solo at bar 201 being a recapitulation of the solo at bar 161. This technique is similar to that used in Part I of *Intégrales*, where the trumpet solo marked the beginning of the subsections. The timings of sections 2-4 reveal similar proportions to the three subsections of the central sections i.e. section 2 is roughly $\frac{1}{3}$ rd of the length of section 1 and section 4 is roughly $\frac{1}{2}$ of section 1 and, finally, sections 3 and 4 are roughly equal to the length of section 1.




(See Example 23)

SECTIONS 1 and 2: BARS 155-190

The combination of the sudden change to a slow tempo and the percussion interlude, in bars 155-160 brings a rare moment of relaxation in *Intégrales* and prepares the listener for the unaccompanied oboe solo, which starts at bar 161. The long first note of the oboe solo and the token percussion parts, in bar 161, bridge the gap between percussion activity and unaccompanied oboe. The oboe solo, itself, is split into two phrases, the first phrase lasts from bar 161 to bar 163 and the second phrase from bar 164 to bar 168. Both phrases are centred around the note F (the note missing from the chord at bars 153-154). The first phrase is in complete


in that it does not use a complete note-group, in fact, it uses the notes C#, D, D#, E, F and G (F# being the missing note). The way in which the note-group unfolds is a little jagged. (See Example 24) The second phrase, however, starts in a similar fashion, but develops beyond the G, which was the final note in the first phrase. By the time the second phrase settles on the final F# it has used a complete note-group (C-G); and used it in a more symmetrical manner. (See Example 25)

In bar 168 the piccolo weaves a pattern of notes that is based on the trumpet figure from bar 60, which extends the oboe note-group to Bb-G. The figure ends on a Bb, which is taken up by the Eb clarinet, thereby, reminding us of the Bb pedal point from the opening section of the work. The entry of the Bb clarinet E, at the end of bar 168, creates a high woodwind chord with the Eb and Bb clarinets playing the same notes they played in bars 1-29. The C trumpet then responds by playing a rhythmically articulated B#, with grace notes, that is reminiscent of the pedal points played throughout bars 1-52. In bar 169 the association with the early pedal points is enhanced by decoration which is similar to the way the trumpet ornamented the pedal points in bar 10 and bar 18 and the way the horn ornamented the pedal point in bar 44.

The decoration of the C trumpet B# results in the demise of the Bb and at the beginning of bar 171 the trumpet settles on a sustained B#, thereby, forming a new chord with the Bb clarinet E and the oboe F#; a chord constructed from two perfect 4ths.  The trombone then answers with a chord constructed, like the trombone chord in bar 93, from two perfect 5ths.  The tenor trombone Bb is played in a similar manner to the tenor trombone solo in bars 32-52; both play quintuplet semiquaver groups, glissandi and the  rhythm (though in a different part of the beat).

The horn part in bars 171-173 is the odd-one-out in this passage; it starts by playing a figure which is derived from the semiquaver 4ths., used in bar 149 and then, in bar 173, it merges with the trombone chord.


The passage from bar 174-182 is in two halves; bars 177-182 basically

being a repeat of bars 174-176. The passage starts with the D trumpet continuing the Bb of the tenor trombone, but immediately alternates between the Bb and the newly introduced C, and recalls the style of the earlier pedal points. As the trumpet settles on the C, the high woodwind play a chord in the manner of the high woodwind chord in Bar 5, but based on the structure of the trombone chord from the same bar. The trumpet and high woodwind soon merge into a single sound mass, as they diminuendo as one; this is because, together, they form a single note-group (B-D). The main interest in bars 175 and 176 is in the percussion parts, where the Chinese blocks play a solo based on the  rhythm from bar 158. This leads the music into the second half of the section, where no percussion instruments play.

The trumpet, again, begins alternating between Bb and C and, as in the first half, is then joined by the high woodwind chord, but instead of being opposed by the percussion, the trumpet and woodwind are now opposed by two wind sound masses which alternate but are, in fact, linked by virtue of sharing the same note-group. The opposing sound masses play a succession of semitone or major 7th clashes, using the note-group Eb-A. (This note-group, combined with the B-D note-group of the high woodwind and D trumpet, forms an 11-tone note-group, omitting the Bb, which was an important note in the Eb clarinet and tenor trombone parts in the previous section - bars 168-172). In bar 178 the clarinets play Ab/A, the horn, C trumpet and contra-bass trombone play F, F# and G, and in bar 179 the horn and contra-bass trombone play Eb/E. This sequence is then repeated in bars 180 and 181 and only the clarinets continue to play their clash in bar 182.

The structure of this section reveals that repeats are used on two different levels. Firstly, there is the high woodwind chord and the D trumpet pedal point, first heard in bars 174-176, which is repeated in bars 177-181 (labelled X and X₁ respectively, in Example 26) and, secondly, within the repeat (X₁) Varèse writes two statements of the opposing sound masses (labelled Y and Y₁), each statement being equal in length. Varèse takes

the mathematical relationships within this passage a step further by making X_1 half the length of X . Therefore, if we suppose that Y and Y_1 equal 1 unit of time, then the structure of this passage (bars 174-181) could be expressed in the manner shown in Example 27.

The conflict between A_b/A continues when all other instruments have ceased playing; this is to isolate, and therefore emphasise, this particular pitch conflict. It is actually resolved in bar 184, when the oboe, rejecting the A_b , begins the next passage with a sustained A . Around the oboe A , the B_b clarinet plays a figure, based on the piccolo part in bar 168, which contains two note-groups, $F\sharp-G$ and $D-E_b$, and repeats these notes in various rhythmic patterns until the end of bar 186. After the clarinet flourish the oboe alternates between A and $G\sharp$, thereby, renewing the conflict of the A_b against A in bars 178-182. However, the piccolo reinforces the A by playing each time the oboe A is sounded. The trombone plays a line based on the repeated B_b solo it played in bars 32-52, except that the pedal note is a C , which refers to the pedal C played by the D trumpet in the previous section (bars 175-181). The trumpets and horn provide a steady accompaniment to the counterpoint, by playing a sustained chord which is based on two equal tritones ($B-F-C\sharp$). The four ideas, together, play all 12-tones, distributed as shown in Example 28. During these three bars, the only percussion material is played by the Chinese blocks in bar 186; the first rhythm is exactly the same as the sextuplet semiquavers of the tenor trombone in the same bar, and the second figure () is taken from the last section (at bar 175).

The first direct recapitulation to occur in this final section appears in the next passage, bars 187-190, where all material is transposed up a perfect 5th from the original. It is based on the horn pedal point in bars 32-52 and all three instruments involved, tenor, bass and contra-bass trombones, play exactly the same notes as they played in bars 32-52 (when the transposition is taken into account). The tam-tam and bass drum accompany the bass and contra-bass trombone chord as they did in the original (the

string drum is a new addition in bars 187-188). The first statement of the pedal point is rounded off with the horn playing part of its ornamented version of the pedal point, originally heard in bar 44.

Bars 189 and 190 extend the recapitulation by including a reworking of the wind chord that accompanied the horn pedal point in bars 32-52. The moving parts of the original chord are omitted as they were not part of the structure of the static chord (the piccolo 2 note, because it was not sustained, and the tenor trombone note because it was a solo figure). Likewise, the oboe F in bar 190 is not actually part of the chord's main structure, because it is a solo note which continues independently after the chord. Interestingly, though, if the transposition of a 5th is taken into consideration the oboe note has taken over the role of the trombone solo Bb.

The disposition of the instruments has also been changed. Obviously, as the tenor trombone has been playing the horn pedal point in the recapitulation, it also plays the horn note in the chord. The other changes are straightforward swaps; in the chord at bar 190, the horn takes the oboe note and the clarinets play what were the trumpet notes. Because of the high register of the chord in bars 32-52, in bar 190, all but the bottom three notes have been put an octave down after the upward transposition of a perfect 5th. (See Example 29) The percussion accompaniment to the chord is also changed; only the bass drum and gong remain. The tam-tam and crash cymbal that did accompany the chord in bars 32-55, are deliberately stopped in bar 189 and replaced by the suspended cymbal, snare drum and tenor drum, whose rhythms are based on the Chinese blocks figure from bar 186. The chord consists of 11-tones, the omitted tone being F#, which is why F# is such an important note in the oboe solo which follows.

SECTION 3: BARS 191-200

The oboe solo at bar 191 is similar, in a number of ways, to the oboe solo at bar 161; the important note in each solo is the omitted tone from the preceding full-chord, both are unaccompanied, both use complete note-groups

(bar 161: C-G, bar 191: F-B, though the all-important Bb is studiously avoided until the very end), both melodies are constructed in two halves and they both start on the same note (although F# is the important note in bar 191 while F was the important note at bar 161). However, there are differences; the melodic content (apart from the G-Ab triplet figure which is found in bar 194 and bar 167), the solo at bar 161 was developed with descending chromatic notes, whilst the melody at bar 191 unfolds in chromatically ascending notes.

The oboe solo is interrupted at the beginning of bar 194, by the trumpets, and the mood is abruptly changed. When the trumpets settle on the C and C#, the trombones play a very short phrase based on Section "D". The oboe A continues to crescendo as the trombones are playing, but as the Eb clarinet takes over from the C of the D trumpet, it opposes the oboe A with a rhythmic Ab which gradually supercedes the A as the Eb clarinet gets louder and the oboe fades away. At the moment the percussion enter, at the beginning of bar 195, the change of mood is absolute and the work now embarks on a ferocious three-bar passage which is the climax of the whole piece. It is the only occasion during the work, apart from the full static-chords at ends of sections, where all percussion players and, very nearly, the full orchestra play together in a sustained, highly active passage.

The wind instruments, in this passage, are divided into five sound masses, of which, the second and third are closely linked. Some of the sound masses are associated with certain percussion instruments and particular rhythmic patterns. (See Example 30) The five sound masses use all 12-tones and, generally, keep to their own groups of notes, though there is a certain amount of doubling up. Three of the sound masses derive from material heard earlier in the work; the major 7th played by the bass and contra-bass trombones is based on the trombone pedal points which have often been used throughout the work, the horn idea is loosely based on the Bb clarinet figure in bar 185 and the trombone articulated Ab, with ornamented glissandi, was originally heard as a solo B figure in bars 32-52.

Bars 198 and 199 form a link to the next section. The horn sustains the A from the previous section and is joined by other instruments, which gradually build up a chord which is then used to accompany the oboe solo. The trombone, glissando, in bar 199, not only, gives a reminder of the sound mass it played in bars 196 and 197, but also, the F in the glissando completes the note-group D-G which is used for the chord in bar 200. The Chinese block figure in bar 198 is a development of the rhythm it played in bars 32-52, significantly, the section in which the tenor trombone played the solo B \natural with a glissando, identical to the glissando in bar 199.

SECTION 4: BARS 201-224

The oboe solo at bar 201-206 is almost exactly the same as the oboe solo at bar 161-168. The changes include:

- 1) Transposition down a minor 3rd.
- 2) The first and last notes of the first phrase are shortened, the first is $6\frac{1}{2}$ beats long instead of $7\frac{1}{2}$ and the last is $4\frac{3}{4}$ beats long instead of 5 beats.
- 3) The melody finishes two beats earlier.
- 4) The second phrase is accompanied (by the chord that was first heard in bar 200).

The accompanying chord punctuates the important notes of the oboe melody, which is a similar technique to that employed by the D trumpet in bars 93-100 and the Bb clarinet in bars 131-132.

In bar 206 the string drum announces the start of a new passage which is, in fact, the return of Section "C" from bars 101-121 and bars 144-154. Bars 206-212 represent a reconstruction of several parts from the two original statements of the sound mass. The rhythm of the first phrase, for example, is taken from bar 105, whilst the pitch is based on the recapitulation at bar 144, but transposed down a tone. The D trumpet plays what was previously played by the horn, the C trumpet plays what was the D trumpet part and the tenor trombone plays the C trumpet part.

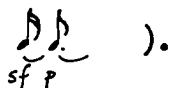
The second phrase in the passage, bars 210-212 is taken directly from

bars 148-149. The final chord of the trumpets/trombone idea (bar 212) is opposed by the woodwind, which plays a chord which crescendos while the trumpets and tenor trombone diminuendo. Significantly, the only notes which are rhythmically articulated, are the A and Bb in the woodwind chord (the importance of this feature is emphasised by the fact that the castanets play the same rhythm). The dominance of the woodwind chord is underlined by the accompaniment of the suspended cymbal and the triangle at the end of the crescendo.

After the one-bar percussion interlude, which is based on bar 103 (Section "C"), the recapitulation of wind material from Section "C" resumes. In bars 206-212 the trumpet pitch centre was lowered one tone; now in bars 214-216, Varèse transposes the whole of bars 118-120 down a minor 3rd. The only changes are to the rhythm in the horn and contra-bass trombone parts, and the final note of the horn (which in bar 120 was Bb and in bar 216 is Eb instead of the expected G).

At the beginning of bar 217 the Bb clarinet shifts to a C to form a chord with the piccolos that consists of two equal intervals of an augmented 4th, which derives from the structure of the trombone chord in bar 93. The horn moves up a semitone as the percussion enter and, immediately after, the woodwind chord ceases to play. The percussion parts that accompany the horn E in bar 217, are basically a slightly extended repeat of bar 213. This bar acts as another short interlude, because, at bar 218 the recapitulation of Section "C", that was started at bar 214, now continues from the point where bar 216 finished. For, bar 216 was the repeat of bar 120 and bar 218 continues to repeat Section "C" from bar 121 (still a minor 3rd lower). Bars 218-223 is a repeat of bar 121-125, the only changes to the original concern the simplified trombone parts in bar 220.

The recapitulation of bars 121-125 leads directly into the final chord of *Intégrales*, which consists of 10-tones (A and D being the missing tones). Because Varèse only required 10 notes for this chord, but wanted all instruments to play, he had to double one of the notes (C), but, to avoid

it sounding obvious, keeps them well apart; one is played by the Bb clarinet and the other by the bass trombone four octaves away. The chord is accompanied, all the way through, by the tenor drum, cymbals, tam-tam and bass drum. The gong entry and the beginning of the bass drum roll mark the start of the brass 'pavillon en l'air'. It is interesting to note how Varèse, by being particular about the details of notation, is able to define exactly, when the 'pavillon en l'air' should start (

The construction of the final chord, suitably, rounds-off the whole work by referring back to the very opening of the work. The top three notes of the chord form a minor 9th with a minor 3rd at the bottom of the chord, and the lowest three notes of the chord form two equal perfect 5th's; both of these chord structures have been repeatedly used throughout the work in various related forms.

NOTES: CHAPTER FOUR.

1. Louise Varèse op.cit., p. 210
2. F.Oulette op.cit., p.83

APPENDIX

BIBLIOGRAPHY

- Varèse L. 'Varèse, A Looking-Glass Diary.' Vol.I 1883-1928. London
Eulenburg 1975.
- Fernand Oulette 'Edgard Varèse, a musical biography.' London
Calder & Boyers 1973.
- Ian Bonighton & Richard Middleton 'Ives and Varèse.' Milton Keynes
The Open University Press 1979.
- Karl H.Wörner 'Stockhausen, Life and Work.' London Faber & Faber 1973.
- Joan Peyser 'The New Music: The Sense behind the Sound.' New York
Delacorte Press 1971.
- Eric Salzman 'Twentieth-Century Music; An Introduction.' New Jersey
Prentice Hall 1974.
- Reginald SmithBrindle 'The New Music.' London, Oxford University Press 1975.
- Francis Routh 'Contemporary Music.' London, The English University Press 1968
- Joseph Machlis 'Introduction to Contemporary Music.' London, Dent 1963.
- Busoni 'Sketch of a New Esthetic of Music.' New York, Dover 1962.
- Feruccio Busoni 'The Essence of Music.' New York, Dover 1957.
- William W.Austin 'Music in the Twentieth Century.' London, Dent 1966.
- Martin Cooper (Ed.) 'The Modern Age 1890-1960.' London, Oxford University Press
1974.
- E.Schwartz and B.Childs 'Contemporary Composers on Contemporary Music.'
New York, Holt, Rhinehart & Winston.1967.