

Chapter 2

TIMBRE AND STRUCTURE IN TRISTAN MURAIL'S *DÉSINTÉGRATIONS*

In this chapter I will present a detailed examination of the 1982-1983 spectral work, *Désintégrations* by Tristan Murail.¹ The 22-minute piece is scored for tape and 17 instruments. *Désintégrations* was commissioned by IRCAM and was first performed by the Ensemble InterContemporain on February 15, 1983.² The piece is divided into eleven distinct sections, each characterized by a different type of spectrum, rhythmic profile, and texture. Each section of the work will be examined in terms of its spectra, and the influence of the timbre-chords on the work's structure, phrasing, and cadences, on both the section level and the level of the whole piece. The main focus of the analysis will be on how the timbre-chords affect the musical discourse. While it is possible to reconstruct some of the methods used to create the timbre-chords, this will not be the main focus of the analysis. A number of articles already comment on the building blocks of spectral music,³ and while it is fascinating to understand the mechanics of spectral harmony, it is much more gratifying to examine the musical effects. Just as a Roman numeral analysis of a tonal piece reveals only certain details, a spectral classification would only expose

¹ Tristan Murail, *Désintégrations* (Paris: Éditions Salabert, 1989).

² Ibid., 6.

³ Such as Rose "Introduction to the pitch organization of French spectral music."

the skeleton of a spectral piece. What is more important is how the composer develops the materials as the work unfolds.

Throughout the course of the piece, the spectra are usually transformed using slow and gradual processes similar to those found in Ligeti (see Chapter 1). The transformations have a direct impact on the perceived stability of the timbre-chord, which in turn influences the musical discourse. The processes of spectral transformation make use of techniques that gradually change one chord into a second chord. One of these techniques is known as *mutation*, where one chord is slowly changed into a second chord, using only the notes found in both chords.⁴ A more complex operation is known as *interpolation*. Interpolation occurs when a starting chord is slowly changed into a second chord, achieved by a glissando between the voices of the chords.⁵ There is also the process known as *spectral distortion*, where a spectrum is altered by changing the distance between partials, which either compresses or expands the spectrum.⁶ All of these processes have a number of variants, so it is not always possible to identify clearly which type of transformation is taking place. Luckily, there are several instances where Murail has referred to the spectral transformations.⁷ Wherever it is possible to trace, even in a general way, the transformation, the analysis will incorporate the information.

⁴ Gérard Assayag and Claudy Malherbe, *PatchWork: RepMus Library* (Manual)(Paris: IRCAM, 1996), 20.

⁵ Mikhail Malt and Curtis Roads, *PatchWork: Reference Manual* (Paris: IRCAM, 1996), 40.

⁶ Tristan Murail, "Questions de Cible" [Questions of object], *Entretiens*, 8 (September 1989), 165-66; also Murail, 29 May, 1998, conversation with the author, New York, NY.

⁷ Such as Murail's conversation with the author (1998), as well as the booklet that accompanies the 1996 recording: (Tristan Murail, 1996. *Compositeurs d'aujourd'hui*. Sound Recording, CD 205 212, 1996, Adès, with notes by Julian Anderson). There is also a detailed example, used as one of the tutorials for the *Esquisse* program, which demonstrates the precise steps that Murail used to generate the harmonies for Section X.

However, the main focus of the analysis will be on the repercussions of the transformation.

The first section of this chapter will deal mainly with the foreground material. The harmonic structure for each section will be discussed, as well as its influence on phrasing, cadences, and orchestration. There will be attention given to the level of stability of each passage, as well as the level of tension that each section either generates or releases. The second portion of the analysis will examine how the eleven sections of the work combine into larger units. Large-scale progressions of voice leading and harmonic motion will be discussed, as will the use of rhythm. The chapter will conclude with an overview of the elements of the work, including a discussion of the work's harmonic spectral classification and how it relates to the structure of the work. At this point, we will be able to trace the line of musical continuity through the gradual transformations of the timbre-chords. The main concentration of the whole analysis will be the effects of timbre on the structure of *Désintégrations*, and how the timbral transformations shape the music.

The analysis of the timbre-chords is predicated upon the assumption that a sonority derived from the natural harmonic spectrum will be perceived as more consonant than one taken from an inharmonic spectrum. There is a long history of the association of the natural harmonic spectrum with a consonance, as this is the basis for tonal music.⁸ Unlike tonal music, spectral harmony includes sonorities that are not at all related to the natural harmonic spectrum. Since spectral music

⁸ Stanelly Sadie, ed. *The New Grove Dictionary of Music and Musicians*, Vol. 15. (Hong Kong, London, New York: Macmillan Publishers Limited, 1980), s.v. "Jean-Philippe Rameau," by Cuthbert Girdlestone, Albert Cohen and Mary Cyr, 568-569; see also Hindemith, Paul, *The Craft of Musical Composition, Book 1: Theoretical Part*, trans. Arthur Mendel, revised edition (New York: Associated Music Publishers, 1945), 22-32; Schoenberg, *Theory of Harmony*, 18-22.

contains both harmonic and inharmonic spectra, many composers have treated the natural harmonic spectra as a referential object, often associating it with “points of rest and stability.”⁹ According to Anderson, the “spectra themselves are far less compositionally deterministic than ... their relative consonance or dissonance.”¹⁰ The relative consonance of a timbre-chord is both subjective and contextual, however; in the analysis of *Désintégrations*, the natural harmonic spectrum is designated the most consonant sonority.

Before the main analysis, the rhythmic concepts behind *Désintégrations* and other spectral works must be introduced. Many spectral works deliberately eschew a strong sense of pulse. The composers prefer to rhythmically organize their works in terms of durations. Durations occur when a rhythmic pattern does not clearly articulate a perceived rhythm or meter.¹¹ This concept is important to spectral composers; in one of the IRCAM lectures¹² Grisey spoke of the difference between rhythm and duration. Rhythmic music is controlled by *pulses* (the tempo, expressed in beats per minute) and articulated by *metrics* (the naturally occurring accents that are a product of the meter). The metrics may be regular or irregular, and the pulses may vary. Rhythm is created as the interplay between pulses, metrics, and the musical material. While this formula may produce complex rhythms, such as syncopation or polyrhythms, the pulse is always felt as the guiding force. “Each

⁹ Anderson, Julian. “In Harmony.” *Musical Times*, vol. 134, no. 1804 (June, 1993), 321.

¹⁰ *Ibid.*, 321.

¹¹ Most of Messiaen’s mature works make use of this kind of rhythmic conception.

¹² Cornicello, 18 June 1998, “*Vortex Temporum*.” Lecture notes from *IRCAM Académie d’été*. Presented by Gérard Grisey. IRCAM, Centre George Pompidou, Paris. Available from the author.

rhythm is perceived in its qualitative relationship to meter (on the beat, off the beat) but also in its quantitative relationship to meter (longer or shorter than the beat).¹³

If the reference pulse is not present in the musical material the rhythmic material is not felt in relation to a beat or meter. Instead, the rhythmic material is heard as duration. “Each duration is perceived quantitatively by its relationship to preceding and successive durations.”¹⁴ *Lontano*, examined in the first chapter, is an example of a work based on durations. The tempo is unperceived by the listener, its “only importance is as a point of reference, meant simply for conductors and musicians.”¹⁵

A Foreground Analysis of *Désintégrations*

The foreground analysis of *Désintégrations* will demonstrate how the timbre-chords shape the local events that make up the musical discourse. In general, spectral works do not use themes or motives, as Moscovich has pointed out.¹⁶ Instead, the surface of most spectral works consists of the presentation and alteration of a sonority, using a quasi-homogenous combination of instrumental and electronic sounds. In other words, the musical line of continuity is transmitted

¹³ Gérard Grisey, “*Tempus ex Machina*: A composer’s reflections on musical time.” Translated by S. Welbourn. *Contemporary Music Review*, 2 (1987), 239.

¹⁴ Ibid., 240.

¹⁵ Ibid., 242.

¹⁶ Moscovich, “French Spectral Music,” 22. Moscovich is discussing Murail’s ‘five essential precepts’ of spectral composition, the third of which is “to have a global approach and not a cellular or a sequential one.” This would seem to rule out motivic or thematic processes. Unfortunately, Moscovich does not disclose the source for Murail’s comments. There are a number of exceptions to this rule, of course. Most notable is Gérard Grisey’s 1995 *Vortex temporum I, II, III*.

through the modification of the spectra. *Désintégrations* follows this principle most of the time, and the exceptions to the rule are generally points of interest that will be examined. This portion of the analysis will consider, section by section, the harmonic structure and its relationship to the musical discourse, as well as its relationship to the tension and release model that is found in many musical works.

Section I

Désintégrations begins with a brief, 10-second, tape prelude that functions as an upbeat to the first measure of instrumental music. The tape begins a crescendo from silence, which culminates with the arrival of the ensemble. Measure 1 is deliberately vague and undefined, sounding like the partials of an as-yet-unheard chord; the vagueness of this gesture, as well as the crescendo, highlight the upbeat nature of this measure. The chord in the second measure, struck simultaneously by instruments in the ensemble and tape, serves as a downbeat since it marks the entrance of the instruments. The rest of the section continues this texture. The harmonic element of Section I is derived from the spectra from two low piano notes (B \flat ⁰¹⁷ and C \sharp ¹) that are filtered to produce a variety of chords. Example 2-1 reproduces Murail's notes, showing the chords used in the first twelve measures of the piece. The amplitude envelopes of each of the chords are shaped to resemble

¹⁷ Tristan Murail, "Notes sur *Désintégrations*, 1983(?)" [photocopy], 1, available from the author. Murail's notes for the construction of the spectrum are clearly based on A \sharp , and while the score shows the low B \flat as the inaudible fundamental, the overtones are related to the A \sharp .

the envelope of a piano. A sharp attack is followed by a long decay, with each partial having a different envelope.

Measure numbers

2 4 5 6 7 8 9 9

14 13

(11) 10 (10)

28

36 13 36 15 19

29 11 29 13 12 13 12

20 9 20 11 9 11 12

13 7 13 7 13 11

11 5 11 5 11 7

3 7 7 7

5 6

Fundamental

8ba... 8ba... 8ba... 8ba...

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Example 2-1a Murail's notes for Section I. The measure numbers are indicated above each chord, in bold typeface. The numbers next to each chord represent the partial number in relation to the fundamental shown on the bottom staff.¹⁸

Section I is built from the alternation of the two spectra, beginning with the A^\sharp . The spectra's bell-like quality is emphasized by and reflected in the use of bells and vibraphone. After measure 10, the chords are drawn closer together by the process of mutation. For instance, the chord in measure 13 closely resembles the chord found in measure 4, with the addition of a $G^\sharp 5$, which is close to the G or the G , both of which are a part of the harmonic series related to A^\sharp . Murail also

¹⁸ The following quarter-tone notation is used in *Désintégrations*, as well as this paper: \sharp is a quarter-tone sharp, $\sharp\sharp$ is three quarter-tones sharp, \flat is one quarter-tone flat, and $\flat\flat$ is three quarter-tones flat.

begins to overlap the chords, starting in measure 11 and becoming more noticeable after measure 13. The chords are also attacked in closer proximity, which is heightened by an *accelerando* in measure 21-22. Murail continues the process of blurring the two chords with the attacks in measures 22 and 26. In measure 26, both chords are struck within the same beat. The passage becomes progressively unstable as Murail mutates the two chords into a new object while bringing the chords closer rhythmically. This instability creates a structural upbeat.

In measure 30, the two chords are fused into a single sonority that contains spectra of both chords. Despite the inharmonic nature of the chord, measure 30 is a point of arrival. The structural upbeat of the previous measures is answered in measure 30, much as the attack in measure 2 was an answer to the tape anacrusis. The chord in measure 30 represents the harmonic goal of the fusion process, as well as the peak of a dynamic crescendo. The chords preceding measure 30 all show a gradual increase in density (in the instrumental component, that is), which likewise culminates in measure 30. Hence, measure 30 is perceived as an arrival. The remaining chords of section I similarly combine the two spectra, becoming more inharmonic towards the end of the section. The last sonorities of the section are derived from RM synthesis, producing inharmonic spectra. Example 2-1b presents the chords from measure 30 to 42.

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Example 2-1b Chords from *Désintégrations*, Section I, measures 30-42. The numbers next to the chords refer to the partial numbers as related to the fundamentals listed to the left and right of each chord. Note that some notes belong (exactly or approximately) to both harmonic series. Also note that the third chord has only a few members related to either fundamental, and the last chord has too few harmonic tones to mention.

With the exception of the last few measures, most of this section consists of chords struck simultaneously in the ensemble and tape, and the slow decay of the chordal elements. The piece begins with only a few instruments playing, namely the flutes, clarinets, and pitched percussion. The strings enter in measure 10 as the chordal overlapping begins. Texture, therefore, can serve as a guide to the harmonic tension and release paradigm at work in *Désintégrations*. A break in the prevailing texture is a signal to the listener that the harmonic elements are intensifying. This is especially true of the piano's entrance in measure 19 because it is the only instrument not participating exclusively in the chordal texture. Given the texture, one can almost call the piano's passage in measures 22-28 soloistic (see Ex. 2-1c). The partial disintegration of the texture is important, since it temporarily

disrupts the predominantly homophonic texture. The homophonic texture is resumed on the downbeat of measure 30, which adds weight to the argument that measure 30 is an important structural downbeat.

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Example 2-1c *Désintégrations* Section I, measures 22-28, piano part only.

The arrival in measure 30 is not only the point when the two spectra fuse, but also the first time when most of the full ensemble sounds together.¹⁹ The arrival is short-lived because the chords continue to become more distorted and grow louder towards the end of the section. The acoustical model of the piano envelope is slowly abandoned in some of the parts, such as the string crescendo in measures 36-37. As the piano passage in measures 22-28 foreshadowed the arrival in measure 30, the crescendos in measures 38-42 (particularly the crescendo-diminuendo

¹⁹ The cello and bass do not play in measures 30-33, but the arrival of all the brass instruments (including the now un-muted horn) can not be overlooked as an important event.

pattern in the bass, measures 38-40) create a structural upbeat to the next section of the work. The two brief phrases in measure 43-46 (see Ex. 2-1d) complete the structural upbeat, which is answered by the arrival in Section II. The last phrase provides the final breakdown of the homophonic texture, and represents the highest level of tension in the work thus far. The structural upbeat at the end of Section I is significant because it disintegrates the texture and remnants of the prevailing timbre. For the first time in *Désintégrations*, the instruments are playing independently of each other, and the timbre-chord is based on an inharmonic spectra.

43 Piccolo

Flute

Clarinet

Marimba

Piano

15ma.....

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Example 2-1d *Désintégrations*, Section I measures 43-46, piccolo, flute, clarinets, marimba, and piano only. All parts sound as written, except the piccolo, which sounds an octave higher.

Murail starts the work with a spectrum closely related to the natural harmonic series. The natural harmonic series will be perceived as more consonant than an inharmonic spectrum, as various writers have claimed.²⁰ The upper partials of a harmonic series will most likely be perceived as more consonant than an inharmonic series.²¹ *Désintégrations* begins with a relatively consonant chord. The texture and dynamics are used in correlation with the harmonic elements to create a low level of tension. As the section progresses, the tension increases, reaching its first plateau on the major arrival in measure 30 (see Diagram 2-1). The arrival immediately undermined by the distortion of the timbre-chords and the uncoupling the musical events from the piano-like envelope. As a result, the passage following measure 30 continues the upbeat pattern. The chord reached at the start of Section II (in the piano and tape) is the goal of the upbeat, and therefore an important articulation. Most important is the arrival on the low G, the pedal point for the first 31 measures of Section II.

²⁰ See the paragraph on timbre-chords on page 52.

²¹ This depends on the partials present in the sonority in question. A chord which contains only partials higher than partial number 60 is less likely to be perceived as consonant than one with much lower partials.

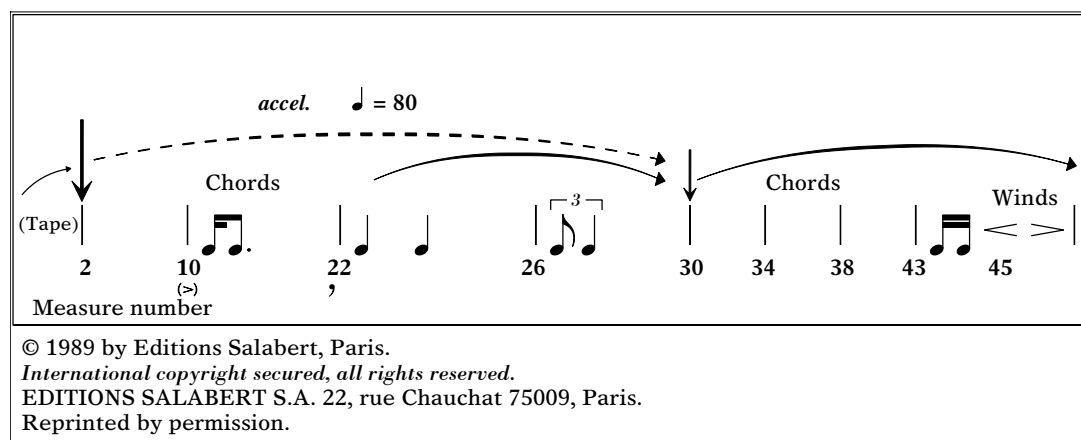


Diagram 2-1 Schematic reduction of *Désintégrations*, Section I. Structural downbeats are indicated by arrows; the larger arrows indicate more important structural downbeats. Significant articulations are indicated by barlines, and an accent above the barline denotes a slightly more important articulation. The curved lines indicate direction, and the dashed curves are meant to show significant background motion. Important rhythmic events are expressed in the reduction as notated values.

Section II

The opening portion of Section II is based on an extremely slow transformation of one chord. The first 29 measures²² of the section are built on one chord, which is based on RM synthesis.²³ The timbre-chords in this section are articulated as an arpeggio built upward from the bass. Most of the chordal elements of this section are played as tremolos, trill-like figures between two notes, or as single notes that are sustained, usually with a hairpin dynamic curve. The dynamics give an expansive quality to the section.

²² The measure numbers start over again for each section of the work.

²³ Murial, conversation with the author. This is not indicated anywhere in the score, and so it is impossible to retrace the steps taken to generate the ring-modulated chord.

The first three phrases, as well as the start of the fourth, are prolongations of the same timbre-chord. The harmonic motion does not begin until measure 31, when the new elements are added, as shown in Example 2-2a. The chordal transformation that occurs from measure 31 to measure 37 is not clearly articulated. Instead, the new notes are introduced as part of the existing musical texture, creating a slow transformation rather than a progression. The transformation is most clearly demonstrated in the bass part, which moves from a G1 in measure 30 to a G 1 at the end of measure 32. There is a cutoff and clear articulation in measure 38, and a similar gesture in measure 45. From measure 45-58 there is no clear articulation of the chords as the transformation process, now greatly accelerated, resumes.²⁴ The timpano's first note of the work articulates the arrival of the F2 in measure 58. The arrival on F triggers a change in the texture, from a Ligetian micropolyphony to a mostly homophonic texture alternating between two chords. The two chords are closely related to the harmonic spectra over F and B, but they do not literally reproduce the harmonic series (see Example 2-2a. The alternating F and B spectra are the last two chords in the example). The harmonic motion of the entire section moves from an inharmonic spectra (generated by RM) to a slightly distorted harmonic spectra. The alternating chords are continued in measures 60-82, and the chords are gradually filtered so the higher partials remain. A written out *ritardando* is utilized in this passage to heighten the sense of structural upbeat. By measure 86, the only remaining note is a G7, a note that is common between the two spectra presented in measure 60. The same G7 is re-articulated to begin the next section of music.

²⁴ The rate of transformation is accelerated when compared to the same process that occurred in measures 31-37. The transformation in measures 45-58 cover a much wider range of harmonic

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Example 2-2a *Désintégrations*, reduction of harmonic motion in section II. Measure numbers are indicated above the chord. Parenthetical measure numbers refer to when the notes in question are *added* to the sustained chord.

The chords in Section II are sustained much longer than the chords of the first section. This creates an illusion of stability, despite the presence of unstable RM chords. There are some articulations during the first chord, at measures 11, 18, and 27, but these articulations are not indications of a new chord or texture (see Diagram 2-2). The clearest articulations occur in measures 38, 45, and 58 where changes in harmony do occur. The arrival at measure 58 is especially significant because of the bass motion. Until measure 58, the bass has been moving in small increments, usually a half step or smaller. The bass moves down from C3 in measure 57 to a tremolo between F2 and B2. This creates a prominent arrival, since

motion, which results in an acceleration of the process.

it introduces the F and B harmonic series that eventually coalesce on the high G and begin the next section. All of the music from measure 61 (where the *accelerando* begins) onwards is upbeat to the G7 that begins Section III. The G is followed by silence, creating a textural cadence.

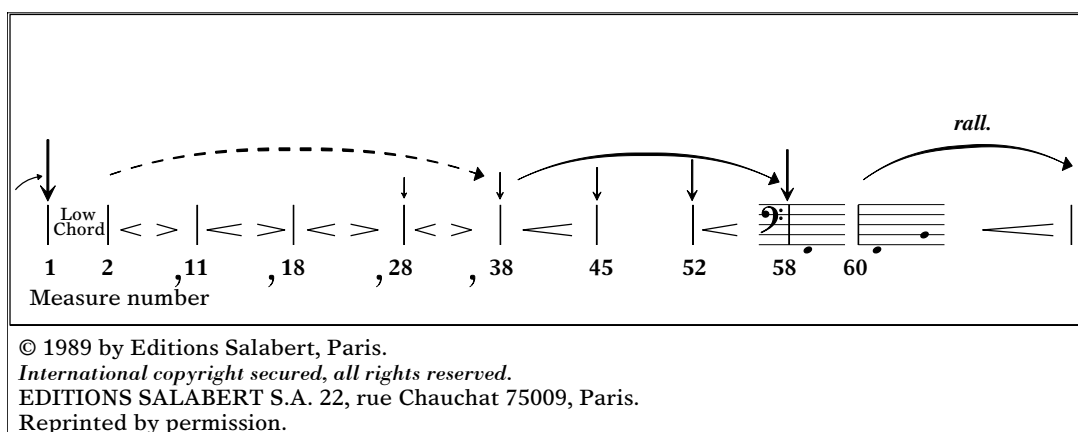


Diagram 2-2 Schematic reduction of *Désintégrations*, Section II, illustrating significant structural features.

In contrast to the discrete steps found in Section I, Section II is somewhat amorphous, slowly changing from one sonority to another. The differences between the two sections may be observed in the general spectral motion, which moves from harmonic to inharmonic in Section I, and inharmonic to harmonic in Section II. The two sections form a unit, moving from harmonic to inharmonic and back to a harmonic spectrum.

There is also a parallel connection between the two sections. By creating a synthetic spectrum Section I blends together two spectra. The end of Section II creates a type of blend by using a note that is common between two spectra.

Although the two processes find a common ground between two disparate spectra, the results are remarkably different. The first produces an inharmonic chord that propels the music forward, while the second creates a kind of cadence on a single note.

Section III

The third section of *Désintégrations* begins with a texture that Murail calls the “cloud of small bells.”²⁵ The texture is starkly different, consisting of glockenspiel, crotales, and piano, all playing rapid figurations in an extremely high register. In terms of rhythmic activity, this passage is the most sparse heard thus far; when combined with the harmonic elements, the passage is perceived as relatively unstable. As opposed to the gradual processes of Sections I and II, the harmonic structuring of this section is quite complex. Murail chose the even-numbered overtones of a spectrum built upon an unsounded F1; these partials are then used to generate their own harmonic series, which are based upon the spectra of the flute, clarinet, and trombone.²⁶ Example 2-3a reproduces Murail’s chart for this section.

²⁵ Murail, “Notes sur *Désintégrations*, 1983(?)”, 2, originally “nuage de clochettes”, translation by the author.

²⁶ Ibid., 2. See Murail, “Spectra and Pixies,” 168 for the identification of the instruments used to create each of the secondary spectra.

**Origin of fundamentals
for the “clouds”**

(fundamental)
(•)
8ba

Composition of the first “bell cloud”

[Flute] 15 5 9 3 7 12
[Flute] 15 8 3 5 7 5 8 4 6
[Clarinet] 15 11 14 12 14 16 13 19 21 23
[Trombone] 15 20 29 17 22 24 15 13 15 18 35 19 24 27 17 14 22 26

Consolidation of spectral cloud (end of 4th “cloud”)

15 13 9 12 7 11 4
[Alto Flute] (all sustained)
(•)

Example 2-3a Murail’s chart for the opening measures of Section III. The numbers near the notes identify the partial number in relation to the indicated fundamental.

As opposed to the previous sections of *Désintégrations*, the spectra are not separated in any distinct fashion. The opening measures present all of the spectra in rapid succession, usually simultaneous or overlapping. Owing to the relationship

of the fundamentals, the passage does not sound cluttered or inharmonic. Example 2-3b illustrates the opening measures of this section. Note the correspondence to Murail's chart that was reproduced in Example 2-3a.

1 (Tape) 15ma.....1

(G4) 3

(A#4) 15ma.....5

(D#4) 15ma.....1

(C3) 3

(Crotales) 8va.....

ff 3 *sempre l.v.*

(Glock.) 8va.....

ff 7 *sempre l.v.*

(Piano) 15ma.....

ff 3 *sempre l.v.*

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Example 2-3b *Désintégrations*, Section III, measure 1. The indications in the tape part refer to the harmonic spectra as shown in Example 2-3a.

Section III begins with an articulation of the G7 that is struck by the piano, glockenspiel, and crotale in the first measure of the section. It is an important articulation, since it is the first unadorned unison. The high register of the

articulation, as well as the music following, creates an unsettled atmosphere, primarily due to the absence of a clear fundamental. Another cause for the unsettled quality is Murail's use of short phrases. At the beginning of Section III, the phrases are one or two measures long, separated by full measure rests. To further complicate matters, each phrase is a combination of different spectra. The phrasing stands in stark contrast to the long sustained chords composed in Section II.

As the rapid figuration occurs in the keyboard instruments, lower notes are slowly revealed as the phrases develop. The music moves towards lower registers, and starting in measure 14 the wind instruments (those generating the secondary harmonic series) sustain their respective fundamentals (see Ex. 2-3a). Each note is attacked individually and sustained for a variety of durations. The flutes, clarinets, trumpets, and trombones sustain single pitches for most of the section. Notes, foreign to any of the spectra, are slowly introduced, starting with the A in the strings in measure 26. The sustained lower notes add a degree of stability to the passage.

After measure 31, Murail moves the timbre-chords away from the prevailing spectrum. As in the previous sections, the chords develop by a transformation process; the motion in the third section is rapid in comparison to the previous sections. Example 2-3c demonstrates the harmonic motion of measures 31-61, which is the end of the section. Note there is a downward motion as the bass descends from C₃ to the C[#]₂ found in the closing measures of the section. One can trace a slow glissando through the voice leading in many parts. For instance, the A₄ that is found in measure 31 (see Example 2-3c). In measure 43, the A₄ is displaced by an A[#]₄, which moves to an A₄ in measure 50 and an A₄ in measure

53. The note moves to an $A\flat_4$ in measure 57. The $A\flat_4$ remains until the end of the section. All of the original fundamentals undergo similar treatment during this section. The harmonic sliding creates instability and the beginning of a structural upbeat.

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Example 2-3c *Désintégrations*, harmonic reduction of Section III. Measure numbers are indicated below the lower stave.

In addition to this harmonic sliding, two other distinct elements emerge. The first is a melody in the English horn (starting in measure 42, see Example 2-3d), the first real melodic passage in the piece. The melody functions in a manner similar to the piano fragments in the first section: it stands out in relief against the otherwise

homogenous texture. The English horn's melody is derived from arpeggiation of the chords. While the melody unfolds, the rate of harmonic change begins to accelerate.

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Example 2-3d *Désintégrations*, Section 3 measures 42-61, English Horn melody.

The second distinct feature is the repetitive arpeggiation found in the strings in measures 58-60. Even with polyrhythms, there is a sense of a steady pulse. As with the English horn melody, the pulsed section is a disruption of the prevailing

texture. Several times in the work it has been demonstrated that a break in the texture indicates a corresponding rise in harmonic tension, which results in an upbeat. Clearly, measures 42 to the end of this section create a structural upbeat, and the pulsed string writing in measures 58-60 contribute to the rise in tension.

One would expect the repeated phrases in measure 58 to create stability, but in this case the repeated phrases destabilize the passage by emerging from an otherwise homogeneous texture. Without any points of stability, the entire section functions as an upbeat passage that accelerates towards the downbeat of the next section. Diagram 2-3 illustrates the main features of Section III.

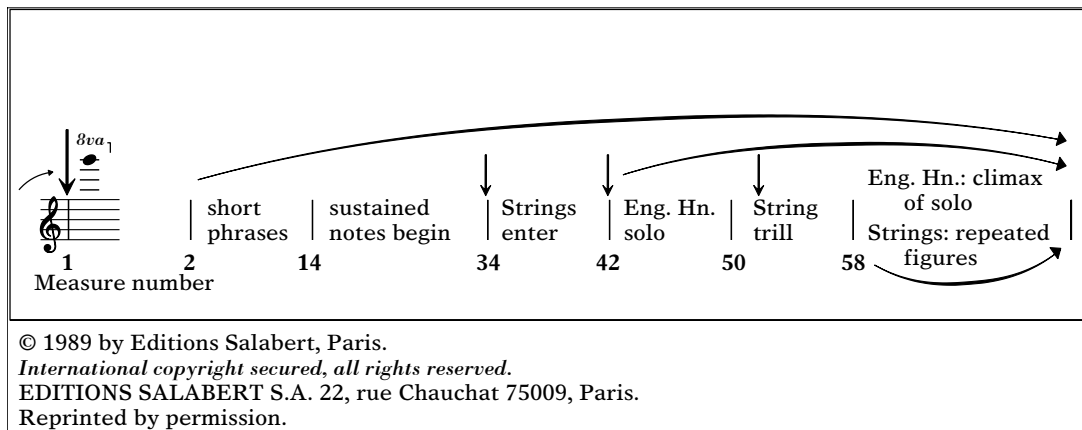


Diagram 2-3 Schematic reduction of *Désintégrations*, Section III.

Section IV

The gesture that begins Section IV is the cadence that ends Section III, creating an overlap between the two sections. The cadence is created by a quick downward arpeggio, similar to the repeated arpeggios in the closing measures of Section III. The lowest notes at the end of Section III (C[#]2) and the lowest note of the first chord of Section IV (B^b1) are a reminder of the fundamentals of the harmonic spectra that opened the work. The descent of a minor third in the bass was a prominent feature of the opening of the work, and a return to the same pitches (up an octave) aids the cadence. This does not imply any sort of return to the opening sonorities or gestures, but the bass motion does recall the opening measures. What is most important about the cadence at the start of Section IV is that the opening gesture (the minor third descent) is now re-interpreted as a cadential gesture. The passage, shown in Example 2-4a, is a release of the tension created at the end of Section III.

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Example 2-4a *Désintégrations*, Section IV, measure 1, brass and upper strings omitted. The phrase in measure 1 is known as the *cascading gesture*.

The cadence is elided to begin Section IV, and the cadential pattern, the rapidly descending arpeggio, becomes the springboard for the first few measures of the section. The cascading arpeggios appear in measure 2, and three arpeggios in rapid succession are sounded in measure 4. The arpeggios are followed by a series of low, inharmonic spectra, articulated clearly in measure 5, and then presented as tremolo through measure 8. (Example 2-4b presents the harmonic outline for measures 1-8 of Section IV.) These gestures, the cascading arpeggios and the low chords create excitement in the work. The structural upbeat that was detected during the last half of Section III has not been properly resolved, and this passage continues the upbeat.

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Example 2-4b *Désintégrations*, reduction of Section IV, measures 1-8.

An important upbeat is produced in the remaining portion of Section IV. The downward moving arpeggios are answered by upward moving figures starting in measure 9. There are four upward moving phrases, each decelerating at different rates. Murail writes a rhythmic allargando accompanied by a broadening of the vertical space of the chords.

Processes of interpolation between the highest and lowest chords in each phrase create the chords for measures 9-24. Murail's interpretation of the interpolation process is not literal; rather than stating each chord of the sequence, he occasionally repeats a portion of the series. The re-iteration of chords occurs in measure 15 and 17. The effect is a slight delay in the upward motion of the line, which adds incrementally to the rising tension. The overall motion of the passage is upward, which creates a strong upbeat. Example 2-4c presents the highest and lowest chords of each phrase from measures 9-24.

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Example 2-4c *Désintégrations*, reduction of Section IV, measure 9 to Section V, measure 1. Reduction shows first and last chords from each interpolation series. Note the final goal of the last interpolation series is the first chord in Section V.

In Section IV, the harmonic motion and gesture are fused into one element, described as “a violent rupture.”²⁷ The upward moving phrases are created from an

²⁷ Julian Anderson, notes to *Compositeurs d'aujourd'hui*. Recording, 34.

interpolation process, which in this case emphasizes the upper chords. Through an interpolation process a series of chords that gradually move from the source to the final chord is created. In *Désintégrations*, the interpolation process is directly responsible for the surface of the music, since the process simultaneously produces the harmonic motion and an implied musical line, the chords moving upwards. The ascending gestures that are the basis for a great portion of Section IV show how the modification of a timbre-chord can have a profound and direct impact on the musical discourse.

At the opening of the section, the music reaches an apparent release of tension. The cascading gesture is followed not by silence, but by a loud, repeated chord in the lower register. The low chords are followed by a new gesture, the upward moving phrase. The cadence at the start of Section IV is completely elided, making Section IV a continuation of the structural upbeat. The broadening at the end of the passage is a signal that an arrival is about to take place. Diagram 2-4 is a schematic reduction of the structural features of Section IV.

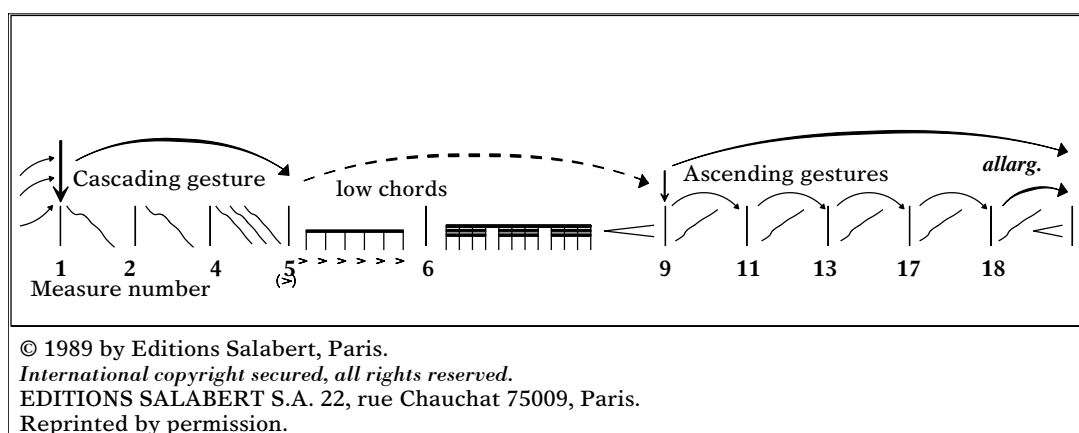


Diagram 2-4 Reduction of *Désintégrations* Section IV. Pitches are omitted to show gestures and rhythmic activity only.

Section V

The fifth section is only slightly longer than the fourth. It is based on a single gesture, the sustained chord, and two subsidiary gestures. The first of these gestures is the short woodwind and string phrases activating chordal tones, played during the sustained chords. The other gesture is the anacrusis chord struck simultaneously in the piano and tape, which always anticipates the notes of the subsequent chord. There are a total of five chords in this section; the chords are sustained, usually fortissimo; the last chord crescendos from *f* to *fff* (in the strings only). The arpeggiating gestures in the woodwinds and strings occur in all but the last chord, while the anticipatory chords in the piano and tape occur before all but the first chord. The anticipatory chords are deliberately created irregularly, so that the second (ensemble) chord is anticipated by two attacks, the next chord by three attacks, the fourth chord by five attacks, and the final chord by one. The activity in this section serves to undermine the stability introduced at the beginning of the section. Example 2-5a is a reduction of the harmonic motion Section V.

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Example 2-5a *Désintégrations*, reduction of Section V. Measure numbers are below the lower staff. The circled numbers between the staves identify the five main chords of the section. The dashed bar lines separate the main chords from notes that are added during subsequent measures.

The beginning of Section V is a major arrival for the piece, and the section starts with a harmonic spectrum on C. Murail uses a chord based on the natural harmonic series to indicate a point of arrival, as he did at the beginning of the work. As the section progresses, the pure spectrum disintegrates into one that is inharmonic. The motion towards less harmonic (and less stable) spectra creates a rise in the level of tension (see Diagram 2-5). The final chord is quite dissonant. Murail highlights the inharmonic effect by including non-pitched percussion instruments, namely 2 tam-tams, a whip, and a guiro. With each repetition of the chord, “the spectrum is more and more deformed until it disintegrates back into grainy noise.”²⁸ The percussion is used to underline the harmonic motion towards an inharmonic spectrum. Section V begins with a clear arrival which releases

²⁸ Ibid., 34.

tension, and ends with a motion towards tension.

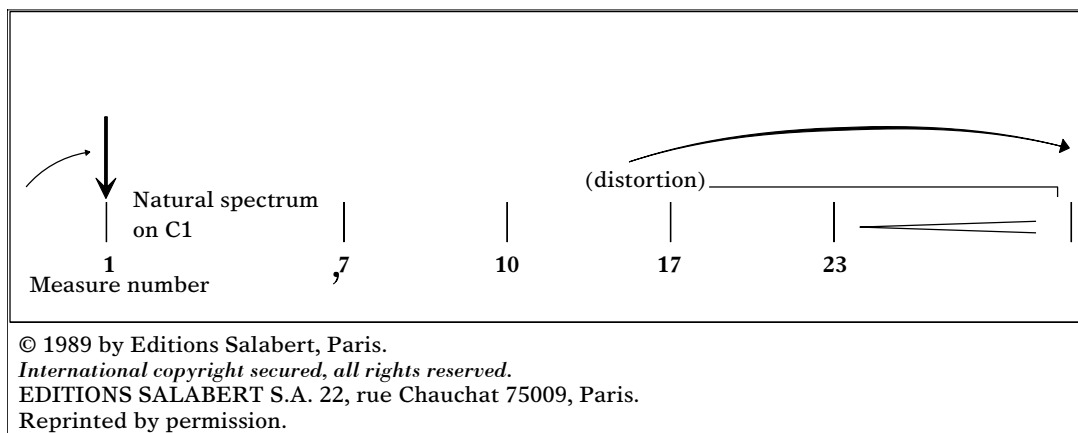


Diagram 2-5 Reduction of *Désintégrations* Section V.

A pattern is created in the manner in which Murail elides cadences. Every time a cadence or significant arrival is reached, the cadence is elided. There is no re-affirmation of the arrival or pause on the cadence. Instead, the music continues to develop, never pausing for reflection. The silences punctuating *Désintégrations* truncate the processes, but often the tension remains. Certainly, the appearance of the cascading gesture at the beginning of Section VI is necessary since it releases tension leftover from the previous section. The cascading gesture also causes another type of overlap, as elements from earlier sections invade Section VI.

Section VI

After the silence separating Sections V and VI, there is a gesture reminiscent of the (false) cadential figure that opened Section IV. The cascading arpeggio appears only in the tape part, as the instruments sustain the chord. Example 2-6a presents the cascading arpeggio opening the section.

1 Fls. *fff* *p*

Ob. *p*

Cl. *ff* *n*

Bs. Cl. *ff* *n*

Bsn. *p*

Hn., Tbn. *p*

Vns. *fff* *mf*

Vla. *fff* *mf*

Vcl. *fff* *mf*

Cb. *fff* *mf*

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Example 2-6a *Désintégrations* Section VI, measure 1. Percussion and tape have been omitted for clarity, as well as performance details. Note the clarinet multiphonic.²⁹

There is a bit of aural confusion presented here. The cascading arpeggio previously released tension. After the build-up of the preceding section, it would be reasonable to expect the same gesture to have the same effect. However, there is not a complete relaxation of tension, as the inharmonic spectrum undermines the release. The strings all play with a technique that “exaggerate[s] the bow pressure on the string (thus producing a noiselike sound an octave too low).”³⁰ At the same time, the clarinet has a multiphonic. The woodwinds are all fluttertonguing, while the non-pitched percussion is played. Here is an instance where an examination of the harmonic elements can help decipher the surface gestures.

The first inharmonic chord found in Section VI is based on frequency modulation. The gesture that is produced with this chord is equally unsettled. Here, Murail presents a gesture of cadence in a position of arrival, and yet the harmonic language undermines the cadence. The cascading gesture is repeated, followed by a ‘noisy’ chord (in measure 9), with the strings moving to *sul ponticello* in the middle of the chord. The second iteration of the cascading gesture initiates a lower level of tension, and the noisy chord in measure 9 actually serves to taper the tension. The two phrases constituting the section thus far serve to lower the energy, but only to a certain degree. At this point (measure 11), a new area of relative stability is reached. The first two phrases of Section VI are thereby introductory to the main body of the Section, which begins in measure 11.

²⁹ The arrows next to the clarinet notes indicate an eighth-tone. In both cases, the notes are one eighth-tone lower than normal.

³⁰ Murail, *Désintégrations*, 7.

Measures 11-25 form the next main phrase group of the section. These phrases are constructed from chords built on frequency modulation.³¹ Each chord is begun *niente* and crescendos to a moderate level. The music unfolds at a fairly slow rate. There are sufficient pauses between the chords so the listener can differentiate between them. This section has all the characteristics of an opening gesture, where material is presented in a clear fashion. However, the inharmonic spectra prevent this passage from being heard as a truly stable harmonic area. Example 2-6b shows a harmonic reduction of Section VI, measures 11-25.

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Example 2-6b *Désintégrations*, reduction of Section VI, measures 11-25. Following each chord are the carrier and modulating frequencies for the FM operation that produces the chord.

At this point, the opening measures of Section VI can be interpreted in a clearer fashion. The initial cascading gesture and chord was indeed a cadence. The cadence is constructed on a new type (for this piece) of harmony, based on

³¹ The frequency-modulated chords are always a product of two notes from the three brass instruments. One of the notes is designated carrier and the other is used as the modulator. This

frequency modulation. It offers a partial release of tension, only because these sonorities, based on frequency modulation, are inharmonic. The passage following creates the impression of a low level of tension, but once again the harmonic language prevents the passage from having the same stability as the beginning of Section V. The clarity found in measures 11-25 is also reflected in the orchestration, which allows no instrument to dominate the passage. This type of writing is also reminiscent of the opening of the work.

The next passage, measures 26-52 begins with the same kind of writing, slowly developing FM chords. In measure 30, two factors begin to push the music towards higher perturbation. The first factor is the overlapping of chords, removing the clarity characterizing the earlier passage. The second is the gradual introduction of elements that protrude from the texture. The crotales and glockenspiel, plus the bell-like sonorities in the tape, form a solo-like passage that extends until 46. In previous sections, whenever an instrumental timbre protruded from an otherwise homogenous texture, there was a corresponding increase in tension. In this passage, the crotale/glockenspiel combination is one of several factors helping to increase the energy.

The overlapping serves to compress musical time (and thus move the work forward) by removing the silence between timbre-chords. This compression of time is intensified further by the return of the cascading gesture in measures 36 and 41. The cascading gesture previously signified a cadence; in this passage, the cadence is subverted by the continuation in the crotale, glockenspiel, and tape. The temporal compression and overlap serves to increase excitement in the passage.

The cascading gesture happens again in measure 46. In this case, the chord is not preceded by a cutoff, because the trombone and contrabassoon are starting a legato phrase, creating another overlap. As was the case in measures 36 and 41, the low arpeggiation raises the tension in the passage. The phrase is cut off for two measures while the strings play a repeated chord that slowly accelerates and ritards; the trombone/contrabassoon arpeggiation continues in measures 51-52 before pausing. The addition of yet another element that emerges from the texture increases the tension even further, suggesting a major structural upbeat is being created. Diagram 2-6 is a representation of the structural elements of Section VI.

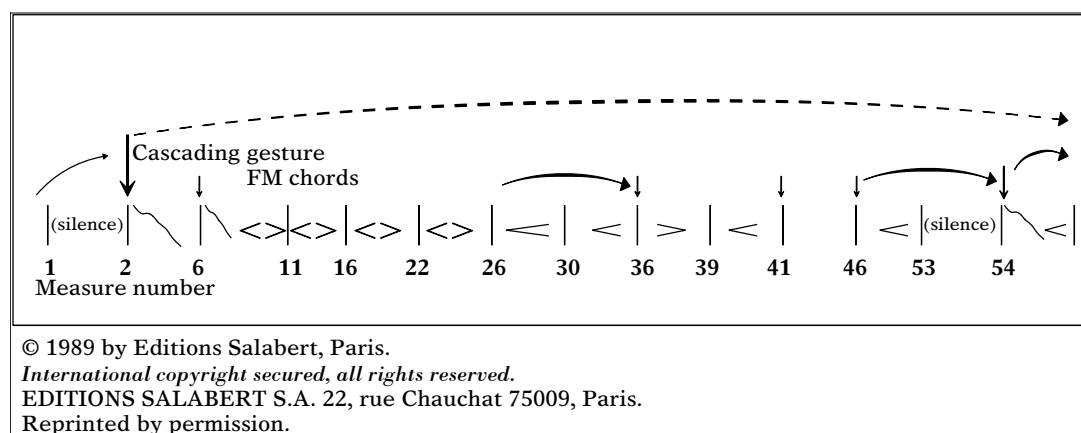


Diagram 2-6 Schematic reduction of *Désintégrations* Section VI.

After the pause, there is one final statement of the cascading gesture. In measure 54, the gesture is preceded by silence, as it was at the opening of Section VI. However, there is an immediate crescendo from the tape part (in the low register), and the trombone begins another arpeggio figure. This brief phrase serves as a transitory coda for Section VI, summing up the basic ideas of Section VI and

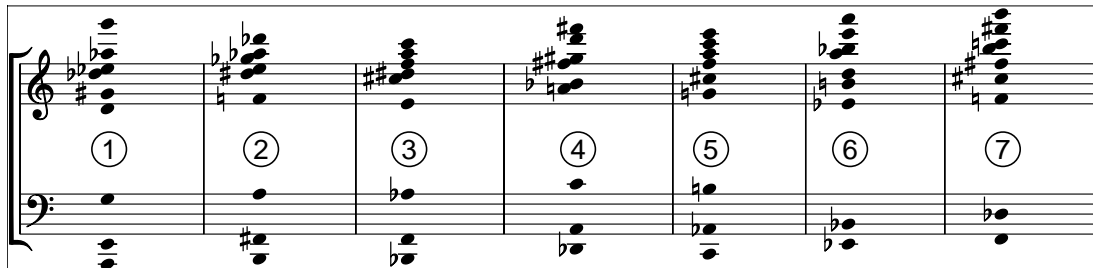
moving the music towards the next section. The instability of the closing measures of Section VI are heightened by the *accelerando*, the first disturbance in tempo for this section.

Section VII

Section VII is characterized by the steady stream of sixteenth notes played by the entire ensemble. The 49 measures of this section are based on seven chords that are repeated throughout. Their order constantly changes. The seven chords presented in Example 2-7a are found in this order at the start of the section.³² Each chord is an approximation of a harmonic series based on a fundamental an octave below the bass note. The chords are repeated in many different orders; for instance, the next iteration of the series is (2 6 4 3 1 5 7), which is followed by (6 5 7 4 2 1 3). There are several instances where the series is not complete. The chords are usually repeated similarly to the original. Any notes added are part of the chord's harmonic series, and therefore do not constitute a significant alteration of the chord.³³

³² There is a slight hint of the chord sequence in the measure preceding Section VII, but the chords are not complete.

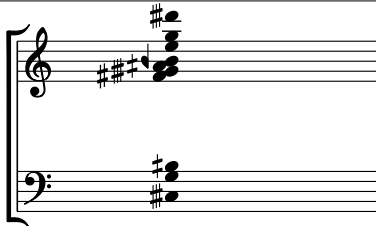
³³ It is important to realize that the chords are sixteenth notes that occur within the context of a ♩ = 90 tempo, so that each chord is ♩ = 360.



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Example 2-7a *Désintégrations*, the seven chords used in Section VII. The first chord has a misprint in the full score: the G \sharp 4 is correct, not the A \sharp indicated in Section VII, measure 1. All other instances of chord 1 uses G \sharp 4.

There are some instances where the material on the surface is not based on these chords. The first is the chord found in measure 10, which is a reference to the FM chords found in Section VI. The cascading arpeggio in the tape, a definite reminder of the preceding section, along with the tam-tam, completes the reference. This chord precedes the sixteenth note runs, which accelerate to sixteenth-note quintuplets. The chord, found in Example 2-7b, creates a weak cadence in measure 10, which is followed in measure 11 by a resumption of the fast note motion.



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Example 2-7b *Désintégrations* Section VII, chord at measure 10.

The first phrase runs from measure 1-10. The second phrase starts in measure 11 and runs to the end of the section. There are a number of articulative points during this lengthy passage, but there is no clear break in the texture. There are two passages of *rallentando-accelerando*, in measures 24-30, and 34-42, which disrupts the steady flow of notes. Rather than separate the passage into sub-phrases, it may be best to conceive of the phrase in terms of episodes. The entire passage can be split into six episodes, each with distinctive characteristics. Diagram 2-7 illustrates the episodes as well as the structural elements found in Section VII.

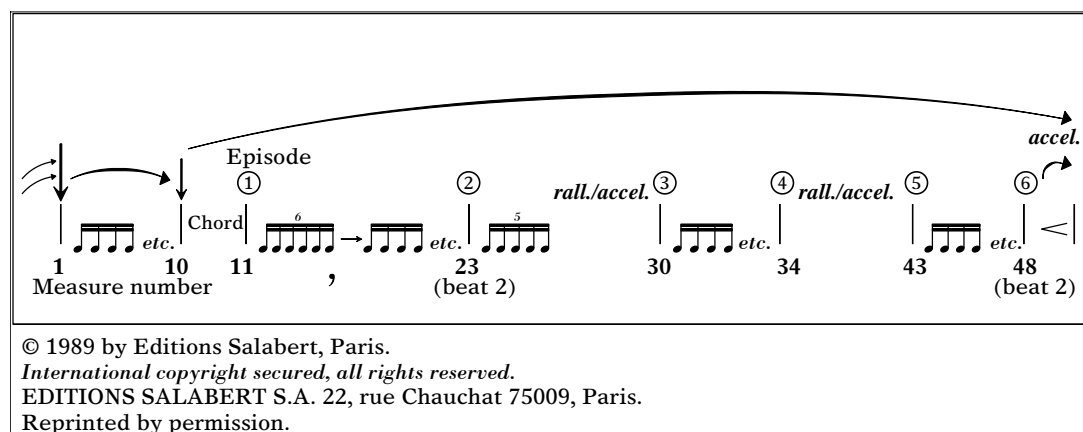


Diagram 2-7 Reduction of the significant structural and rhythmic features of *Désintégrations* Section VII. The encircled numbers indicate the starting points for the six episodes that occur from measures 11-49 of Section VII. Pitches are omitted for clarity.

Although Section VII consists predominantly of sixteenth-note motion, Murail undermines the effect of a steady stream of even note values. He accomplishes by mixing in sextuplets and quintuplets, as in measure 12, and with tempo fluctuation. The constant push and pull of the tempo fluctuations heighten the tension, which culminates with the final accelerando passage. The result is that Section VII continues to increase the excitement that was ushered in at the conclusion of Section VI. Significantly, Section VII does not do so by increasing the level of dissonance. The harmonies in Section VI were based almost exclusively on FM techniques, and the chords in Section VII fall close to the natural harmonic spectrum. Based on previous events in *Désintégrations*, it is reasonable to expect more dissonant chords to follow the FM chords of Section VI as a means of raising the level of tension. Instead, the tension is elevated in Section VII with the presence of a steady stream of sixteenth notes played by the entire ensemble. The tension is

further increased when the listener becomes aware that the same chords are being repeated, although not in any obvious repetitive sequence. The ending of Section VII sets up the climactic arrival of the next section. The ending of Section VII is perceived as a structural upbeat because of the *accelerando* and upward motion of the chords.

Section VIII

Section VIII, the shortest section in *Désintégrations*, consists of one gesture: sustained chords that gradually move from harmonic to inharmonic. To produce the chords for this section, Murail made use of a special technique that he terms “spectral distortion.”³⁴ As described in his 1989 article, “Questions de Cible,” Murail discusses the specific steps he took to arrive at the harmonic structure for Section VIII. Using partials 3 and 21 as a point of reference, Murail gradually stretched the overtone spectrum based on C[#]1 and produced seven chords. The chords are then re-ordered and filtered and additional partials added to shape the density of the chords. Murail likens the effect of this section to an accordion.³⁵ Example 2-8a replicates Murail’s “spectral distortion” diagram.

³⁴ Murail, “Notes sur *Désintégrations*, 1983(?)”, 3-5.

³⁵ Tristan Murail, “Questions de Cible” 165-66.

21st harmonic

3rd harmonic

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Example 2-8a Murail's chart for the chords in Section VIII. The first chord in the middle staff is the unaltered harmonic spectrum over the C#1 fundamental. The numbers next to the chord refer to the partial numbers of each note in the chord. The upper two staves show the stretched harmonics. As the harmonics are raised, the chords in the lower staves become distorted. The lower staves show the chords in the order they appear in Section VIII of *Désintégrations*. The chords in the lower staves are filtered, and notes have been added based on the stretched harmonic series.

As discussed in the previous section, Section VII increases the level of tension in the work. The closing gesture of Section VII is an *accelerando* that heralds the arrival of Section VIII, which is indeed a significant structural point of arrival. However, Section VIII is not cadential. After the arrival, the chords become distorted. The instruments are used to highlight the climactic nature of Section VIII, as most instruments are playing at peak volume, and making use of techniques that

distort the pitch (fluttersong, tremolo, sul ponticello and 'exaggerated pressure' bowing). The tape contributes to the agitated quality of this section with an oscillation of the sound between speakers.³⁶

Section VIII is a continuation of the structural upbeat ending Section VII (see Diagram 2-8). Section VIII does not resolve the upbeat. Instead, it intensifies the upbeat for a moment; Section VIII is the highest point of tension in the work. The intensification of an upbeat has been used previously in *Désintégrations*, most notably in Section V. In Section V, the chords became more dissonant and loud, and at the climax of the passage, the sound was cut-off, and a new section was begun. In Section IX Murail brings the tension-release paradigm to a completion. The release begins with the high piano chord at the very beginning of Section XI, and the gradual release continues through the whole section.

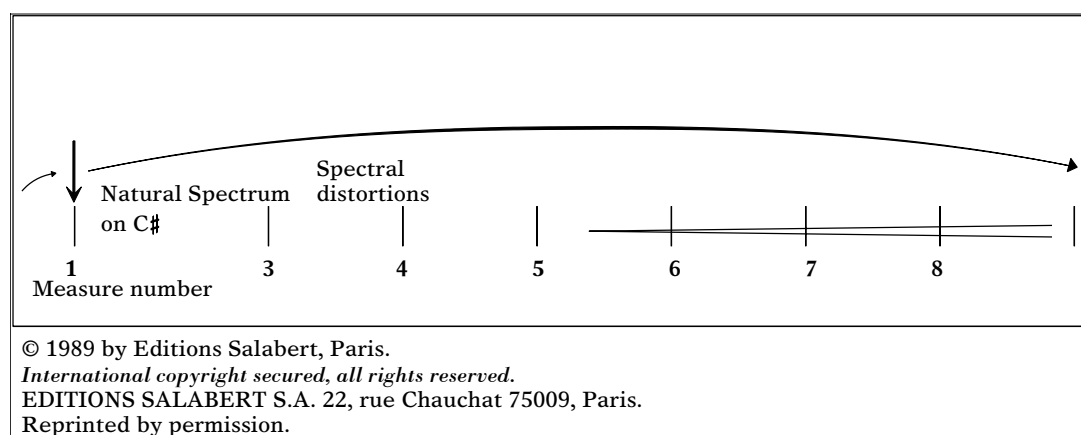


Diagram 2-8 Reduction of Section VIII of *Désintégrations*.

³⁶ Ibid., 165.

Section IX

The ninth section is based upon the gradual unfolding of a chord constructed using RM techniques. According to Murail's notes on Section IX,³⁷ ring modulation is used twice, so two sets of ring-modulated chords become the carrier and modulator of another ring modulation. The final result is an extremely dense chord covering a wide range, which becomes the source for the material in this section. The chord consists of many small intervals (usually half- and quarter-steps), but the phrases used in this section are built on larger intervals. Example 2-9a is a reproduction of the ring-modulated chords forming the intermediary steps in producing the complex harmonic structure of Section IX.³⁸

³⁷ Murail, "Notes sur *Désintégrations*, 1983(?)", 6.

³⁸ The final chord that results from the second RM process is quite complex; the notes create a quarter-tone aggregate for most of the range above C4. For this reason, it was decided not to include the final chord in Example 2-9a.

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Example 2-9a Chart reproduced from Murail's sketches for Section IX of *Désintégrations*. The upper portion of the chart shows the two dyads that were combined using Ring Modulation. The lower staves show the resulting chords that Murail combined once again using Ring Modulation. The final result, not shown in Example 2-9a, became the basis for Section IX.

The recurring cascading gesture forms the basis for the phrases in Section IX. In this section, the phrases are constantly overlapped as each phrase moves lower towards the bass region. The strings (and later, low winds and brass) sustain the lower notes, which articulate the notes of the intermediary chords shown in Example 2-9a. There are some exceptions, such as the G[#]1 in the bass in measure 9. There are also some variations, such as the viola's persistent C₂. The intermittent C₂ is most important because its arrival, in measure 5, is clearly articulated in the bass and tape. The second arrival in measure 19 re-affirms the importance of C₂,

which is confirmed once again in measure 23. Diagram 2-9 illustrates the arrivals in Section IX.

The arrival on C 2 in measure 19 is preceded by an E2, a gesture that is repeated in measures 22-23. This motion is reminiscent of the minor third that opened the work (see the discussion on Section I), as well as the bass motion between the end of Section III and the beginning of Section IV (C#2 to Bb1). The familiarity of this interval (particularly in the low register) creates a point of focus immediately drawing the listener's attention.³⁹ Once the attention is drawn to the lower register, there is an even more important arrival on the low E1, doubled in the bass and trombone. The pitch E1 will become the basis for Section X. It is important to note that a G precedes its arrival at the start of Section X. Once again, the interval of a minor third is used to facilitate an important arrival in the work.

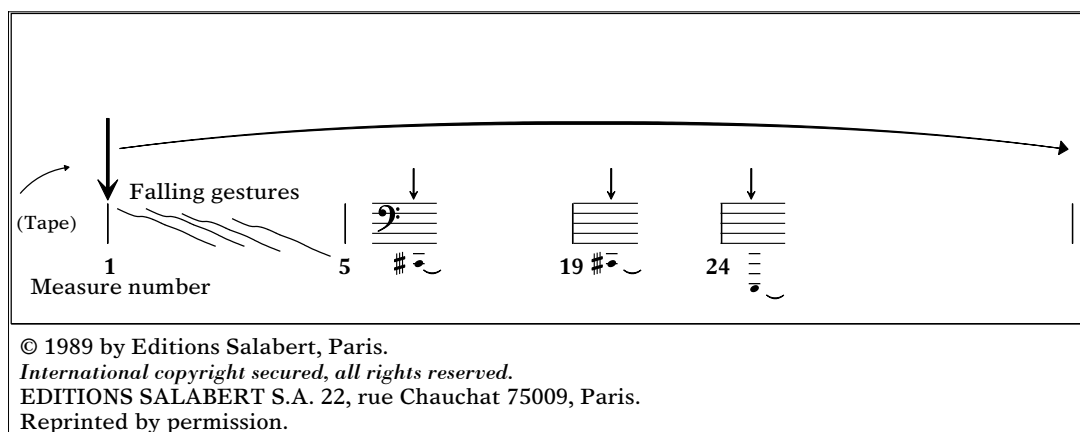


Diagram 2-9 Reduction of the significant features of *Désintégrations* Section IX.

³⁹ Murail amplifies this effect by the *rallentando* in the upper parts, allowing the lower register to be heard clearly.

Section IX is a release of the tension brought about by Sections VI-VIII.

Section IX brings about the ultimate development of the cascade gesture, which was introduced as a quick gesture in Section IV. The cascade gesture constantly appears in Section IX. In this instance the cascading gesture is used as a cadential figure.

When the cascading gesture was introduced in Section IV, it was used as a cadential figure, but the cadence was elided. In Section IX, the cadential gesture returns to its original function, but in an extremely protracted variation. Most instances of the cascading gesture were quick downward thrusts, rarely lasting more than a beat. In Section IX, the gesture is turned into long, flowing, and often overlapping phrases that cover large portions of the pitch space. The overlapping phrases delay the actual cadence until the start of Section X, when the music focuses on E1.

Section X

Section X begins with the arrival on E1, a major structural downbeat. The start of Section X is marked with the bass motion of G – E. The minor third motion, particularly in the bass, has been used before in a cadential manner, at the start of Section IV. In Section X, the minor third motion in the bass enhances the arrival on E1.

The harmonic elements of Section X are based on the spectrum of a trombone playing E1.⁴⁰ Despite the strong arrival on E, there are still some harmonic remnants of Section IX, notably in the violoncello, viola, and piano. As the section

⁴⁰ Murail, "Notes sur *Désintégrations*, 1983(?)", 3.

progresses, these elements become de-emphasized, and the trombone spectrum becomes the more important harmonic structure.⁴¹ The G to E motion is repeated several times during the section, but not after measure 11. There is also a gradual diminuendo as the music focuses more and more on the trombone spectrum.

Example 2-10a shows a reduction of the measures 1-13 of Section X.

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Example 2-10a *Désintégrations*. Reduction of Section X, measures 1-13.

Measures 1-13 continue the gradual lessening of tension characterizing Section IX. While the arrival on E is very important structurally, the cadence does not occur until the harmonic elements have resolved. Section IX consisted of a large ring-modulated chord, and ended with a mutation of the chord into the E1 trombone spectrum. This mutation is not completed until measure 12 of Section X, when all the elements of the ring-modulated chord have been purged. The result is an overlap of Sections IX and X.

⁴¹ The tape is apparently constructed from the trombone spectrum, so the notes not found in the spectrum are perceived as dissonances.

The remainder of Section X is built on the spectral distortion. Example 2-10b shows the distortion, using the twelfth harmonic as the point of reference.

12th partial

15

29 25 21 18 15 12 9 7

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Example 2-10b Murail's charts for the distortion of the trombone spectrum. The uppermost line shows the twelfth partial, which is used to guide the stretching of the harmonic series.

The gradual diminuendo of the first half of Section X is accompanied by a gradual decrease in the surface activity. By measure 12, the instruments are all playing sustained notes, corresponding to the trombone spectrum. These notes are to be found in the first chord of Example 2-10b. As the chords slowly change, the sustained pitches are replaced with new pitches, as indicated in Example 2-10b. Most of the changes are made subtly, so that there is not a noticeable change in harmony. As the section progresses, there is an increase in tension, brought about by the increases in spectral distortion. The increase in tension is aided by the

acceleration of the distortion; Murail has written that the acceleration is a type of temporal distortion that corresponds to the harmonic distortion of this section.⁴²

The overall effect of Section X is the resolution on E that leads to a passage where the tension is once again increased (see Diagram 2-10). The structural downbeat on E is perceived as an arrival, and the listener may even assume that it is the final arrival of the work. The closing measures of the section, measures 27-31, contain a crescendo and the final phase of the distortion acceleration. This clearly indicates a structural upbeat, which is answered on the downbeat of Section XI.

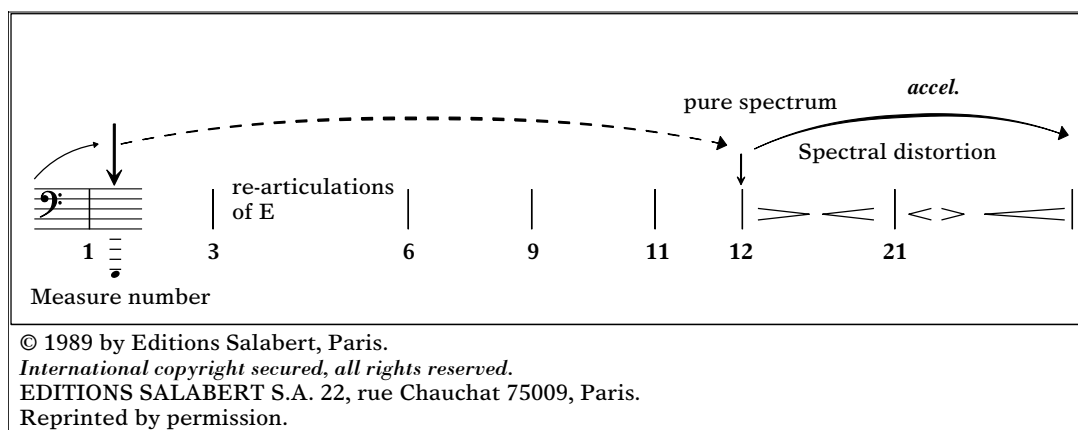


Diagram 2-10 Reduction of the structural features of *Désintégrations* Section X.

Section XI

Section XI begins with a strong, bell-like chord that is followed by repeated Gs in the timpano and bass. The chord appears to be a non-harmonic chord, but it

⁴² Murail, "Questions de Cible", 164.

The next few phrases of this section continue the texture of the first fifteen measures. There are important chordal events in measures 27-28 and 38-39. These chordal events are also directly related to the G-1 fundamental. The G pedal continues in the instruments until measure 40, where it is continued in the tape. In measure 47, there is another important arrival, this time on a spectrum based on G-2; the G pedal returns during the decay of the chord in measure 47, and it is continued in the tape in measure 49. The chord in measure 59 is also based on the sub-audio (below the range of human hearing) G-2 spectrum. After the brief pause in measures 61 and 62, there is a measure of music that is harmonically based on FM. The final sonority of the work, which appears in measure 64, is based on the spectrum from a G-3. Example 2-11b summarizes the main chordal elements of measures 27-64.

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Example 2-11b *Désintégrations*, Section XI, reduction of main chords from 27-64. The notes in this example represent the sustaining elements from the selected measures.

The effect of this section is a final cadence that disintegrates, giving this section the impression of a coda or codetta. The disintegration is highlighted by the solo passages in the piano, in measures 39-43 and again in 51-55. Previously, a solo passage was used to indicate the arrival of a major structural event. In these passages, the solo not only indicates the arrival of the end of the piece, but the final dissolution of the ensemble texture that has characterized the work. Diagram 2-11 shows the significant structural features of section. The strong arrival at the beginning of Section XI on the G is confirmed by the pedal tone and the resounding of the same harmonic series a few measures later. As the fundamental keeps moving well below the audio range, the timbre becomes more non-harmonic. Although the final sonority is based on a pure harmonic spectrum on G-3, the resulting timbre (on the tape) sounds distinctly bell-like.⁴⁴ The bell-like timbres are a reference to the opening measures of *Désintégrations*. The addition of the G pedal, which is present for the first 52 measures of Section XI, firmly grounds the piece around G. The G pedal helps to connect the increasingly inharmonic spectra, since it is present until the third spectrum, which is based on G-2. Significantly, the G pedal is missing from the last sonority of *Désintégrations*, which is based on G-3. The absence of pedal notifies the listener that the cadential sonority has indeed disintegrated, making the final chord something like an ‘anti-cadence.’

⁴⁴ Anderson, notes to *Compositeurs d'aujourd'hui*. Recording, 36.

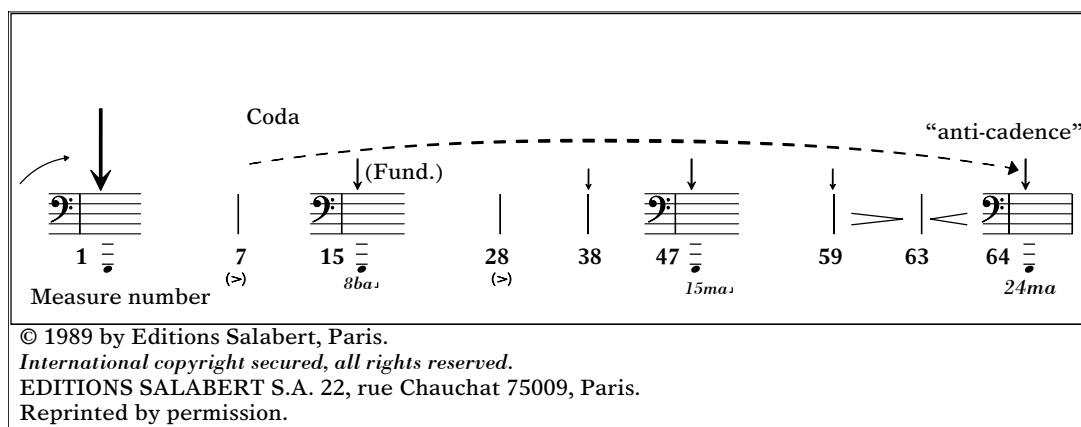


Diagram 2-11 Reduction of the structural features of *Désintégrations* Section XI. Note that the coda begins in measure 7, after the main cadence at the start of the section.

Summary of the Foreground Analysis

Murail establishes the musical discourse through timbral transformations. The timbre-chords and the foreground surface are so tied together that a change in the timbre-chord has immediate and powerful effects on the surface. Because of its introduction at the start of Section IV (creating a cadence that ends Section III) the cascading gesture becomes a cadential signifier rather than a motive.

Thus, Murail's use of timbre-chords and their transformations control the musical discourse within each section of the work. As the timbre becomes inharmonic and distorted, the surface is changed to reflect the disturbance. This is

a reflection of Murail's desire to write "...from the whole to the unit, [which] is opposed to the classical cellular construction technique."⁴⁵ Murail's main concern is the timbral development, which is clearly reflected on the musical surface.

The remainder of this analysis will center on the connections and inter-relations between the sections of *Désintégrations*. While it is true that timbral transformation accounts for a great deal of the musical discourse, there are other forces (namely rhythm, spectral classification, and fundamental-bass motion) having an effect on the shape of the work. Keeping in mind that timbral transformations are the main impetus for the musical line of continuity, these other forces will be investigated at local and large-scale levels of the work.

Form and Structure

Although the work is divided into eleven sections, the sections can be grouped into larger units clearly demonstrating the tension-release schemes of the work. *Désintégrations* can actually be broken into two halves, the first comprised of Sections I-V, and the second, Sections VI-XI.

The work's first half starts with the introductory section I. There is a structural downbeat on the first instrumental entrance, in measure 2. Following the downbeat, the musical elements are introduced slowly, and the slow build-up creates a structural upbeat. The introduction culminates in measure 30, which forms

⁴⁵ Murail, "Questions de cible", 154, quoted in Moscovich in "French Spectral Music", 22.

the first real arrival, and a significant downbeat. Section I concludes with a passage creating another structural upbeat as the tension is raised.

Section II would appear to be the next point of arrival, but the chords are built from RM synthesis. While it is true that the chords are sustained for a long time (over a pedal G), there is not the drop in tension that would occur if the chord was harmonic. Section II starts from a fairly low level of tension, but the tension is raised towards the end of the movement as the music rises to the high G. Diagram 2-12 presents the major structural points of Sections I and II, combined to show the middle-ground level.

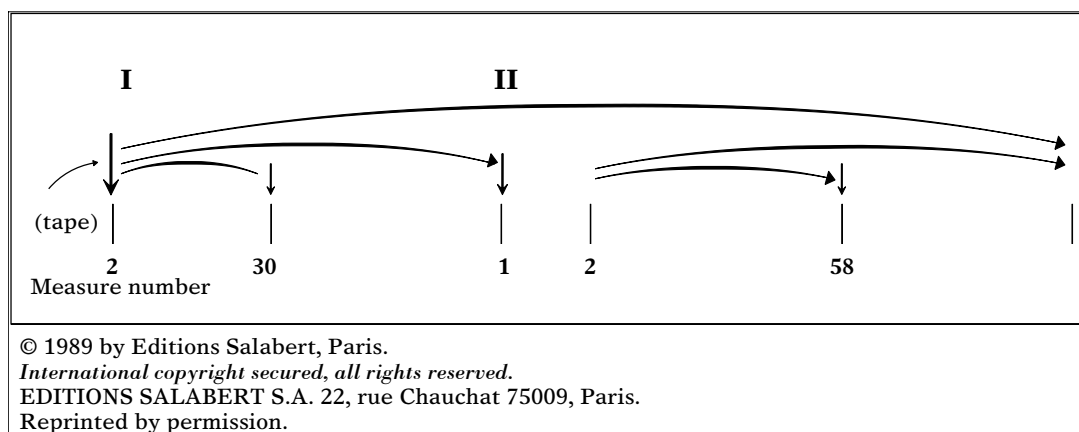


Diagram 2-12 Middle-ground reduction of the significant structural features of Sections I-II of *Désintégrations*.

Section III starts with a structural downbeat, but once again, it is on a high plateau. Therefore the downbeat is not as strong as the initial downbeat in Section I. The change in texture and harmonic motion and rhythm in this section allows the section to be classified as a new subsection. Sections I and II form a distinct unit, and Section III begins a new one.

The faster harmonic rhythm in Section III accelerates into the cascading gesture of Section IV, which raises the tension with the fast moving chords of measures 10-20. The structural upbeat is answered in Section V, with the arrival on the natural spectrum built on C. The expected release of tension is undermined by the unyielding nature of the chord, attacked *ff* several times, with no appreciable decay. As the section progresses, the chord becomes more distorted and a crescendo to *fff* ends the section. In the case of Section V, a downbeat was elided into a structural upbeat. Sections III-V may be combined to form a middle-ground grouping, which is demonstrated in Diagram 2-13.

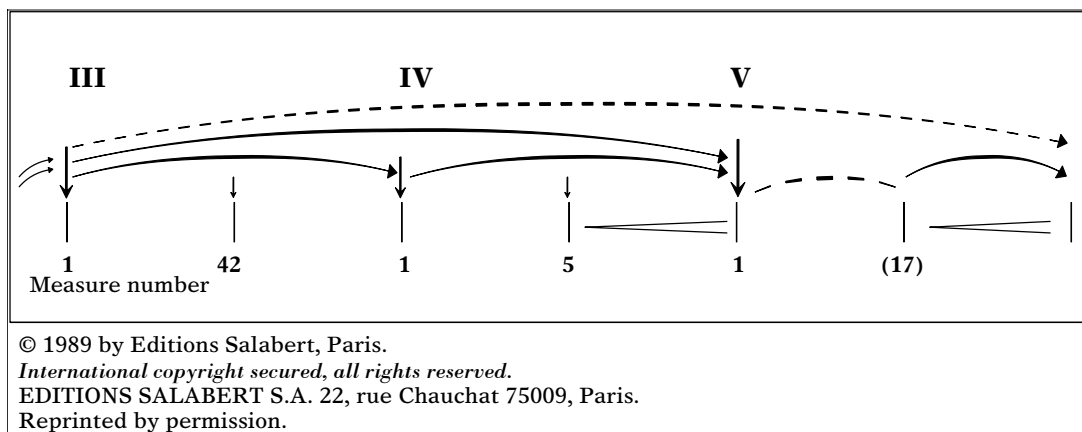


Diagram 2-13 Middle-ground reduction of the significant structural features of Sections III-V of *Désintégrations*.

The combined structural features of Sections I-V may be summarized as follows:

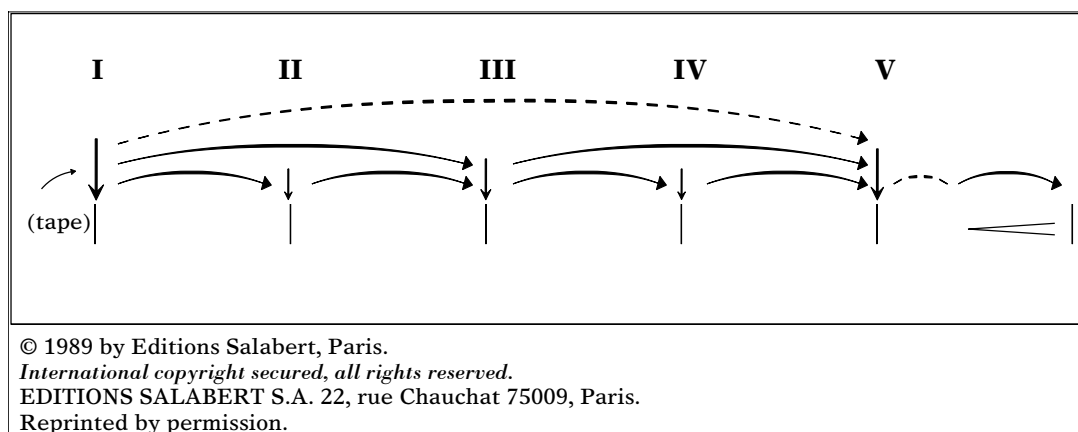


Diagram 2-14 A further reduction of the significant structural features of *Désintégrations*, Sections I-V. Note that the most important downbeats occur at the opening of Sections I (after the tape prelude) and V.

The second half of *Désintégrations* begins with a strong downbeat, perhaps the clearest downbeat since the opening section of the work. Section VI was chosen as the start of the second half of the work based on the parallels between Section I and VI. Due to the gradual nature of most of the work, Section VI begins with a strong reference to the cascading gesture of Section IV. Once these jarring gestures move to the background, there is a relaxation of tension. The FM chords making up most of Section VI are a new element in the work, and the passage from measure 12 to 52 function as a new exposition. There is a gradual rise in tension culminating in measure 36. The remainder of the section dissipates the tension. Murail accomplishes the evaporation of tension without moving away from the inharmonic spectra produced by FM. Instead, he thins the texture and decreases the dynamics slightly. Only at the end of the passage, in measure 51-52, does he hint at an increase in the level of tension. After a pause, an upbeat is created by using a gradual crescendo in Section VI.

The upbeat ending Section VI leads to the furious “toccata for the whole ensemble,”⁴⁶ Section VII. This section, while releasing some of the energy created in Section VI, continues to raise the level of tension through the kinetic energy of the sixteenth notes. The ritardando-accelerando effect of this section contribute to the mounting tension, as well as the endless permutation of the seven chords accounting for most of the harmonic materials of the section. It is a toccata that appears to be move in suspension, expending a great deal of energy while generating more tension.

One may assume that the next section, VIII, would begin with a release of the tension created in Sections VI and VII. Section VIII begins with an arrival on a natural spectrum on C \sharp , similar to the arrival in Section V. Unlike the earlier section, the chord is attacked, *fff*, and the string players are instructed to ‘crush’ the tone. Although Section VIII may be considered an arrival, it is not a structural downbeat. The arrival is quickly undermined by the distortion and permutation techniques. These techniques serve to undermine the stability of this section, and the chords are changed in a rapid, although irregular fashion. These factors point to a structural upbeat as the tension continues to rise during Section VIII.

Sections VI-VIII may be combined to form a middle-ground grouping. This grouping highlights the arrival in VI and the rise in tension created towards the end of this unit. The structural features of these three sections are demonstrated in Diagram 2-15.

⁴⁶ Anderson, notes to *Compositeurs d'aujourd'hui*. Recording, 35.

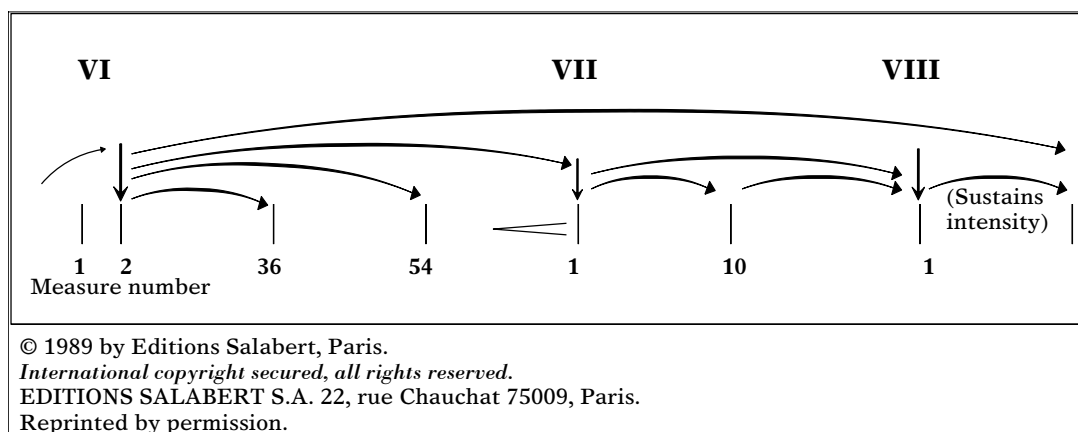


Diagram 2-15 Middle-ground reduction of the significant structural features of Sections VI-VIII of *Désintégrations*.

The ninth section of *Désintégrations* is based on the cascading gesture introduced in Section IV. Section IX is also related to the gradual descent characterizing Section III. The tension is released in a slow and deliberate manner, as the music eventually settles on the low E1 becoming the focus of the next section. The measured pace of the tension release is an essential characteristic of spectral music, which is based on gradual processes. Since the harmonic motion is quite slow throughout most of the work, a fast resolution would seem out of place. The speed of the resolution is also due to the release of tension is independent of pitch relations resolving immediately (as the V/I progression of tonal music). Instead, timbre-chord qualities move towards a state of lowered tension.

The release of tension continues through Section X, as the harmonic elements become focused on the E1 trombone spectrum. The listener may hear everything after measure 12 (the clearest exposition of the E1 trombone spectrum) as a coda. There is a slight increase in tension as the chord becomes inharmonic

and a crescendo builds towards the end of the section. Section XI begins with an arrival on a G-based sonority, which is accompanied by a pedal tone. The tension ebbs and flows during this section, eventually building towards the last inharmonic chord (the 'anti-cadence'). The structural points of Sections IX-XI are illustrated in Diagram 2-16

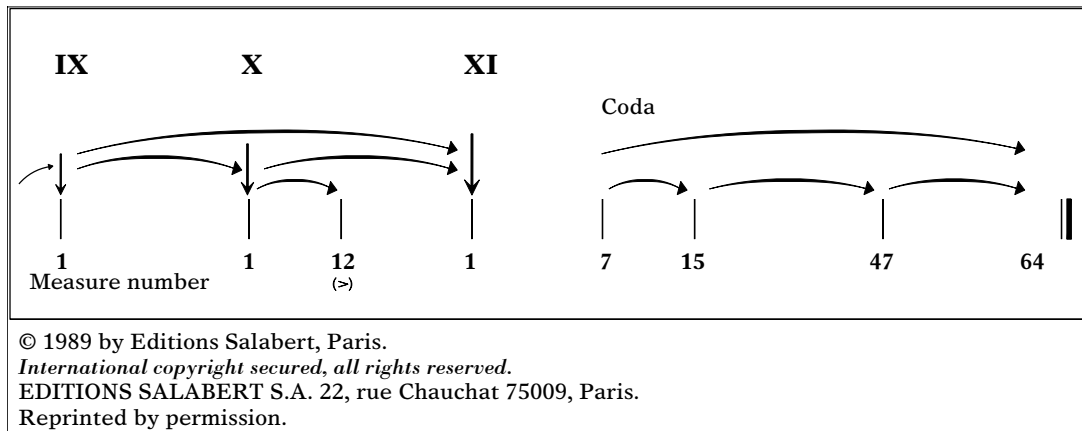


Diagram 2-16 Middle-ground reduction of the significant structural features of Sections IX-XI of *Désintégrations*.

The overall structural features of the second half of *Désintégrations* is summarized in Diagram 2-17:

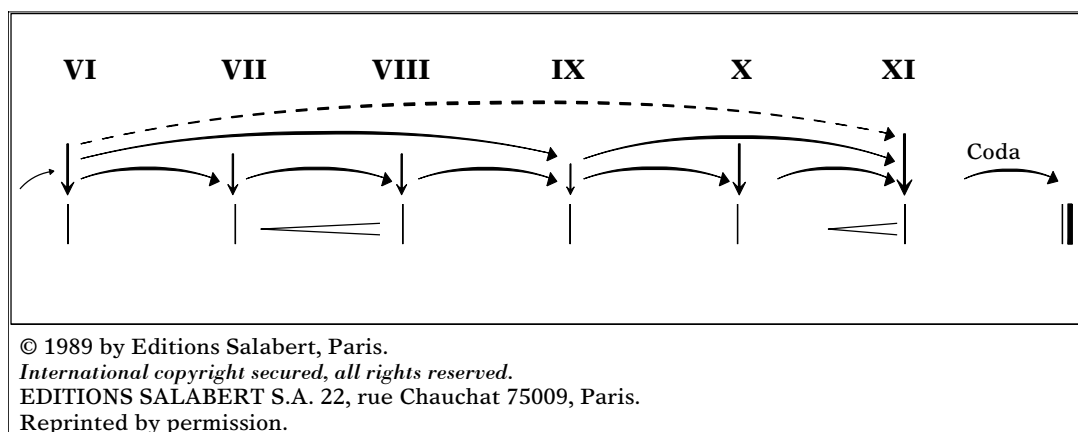


Diagram 2-17 Schematic representation of *Désintégrations*, Sections VI-XI. Note that the most significant downbeat occurs at the start of Section XI. The downbeat that begins Section VI is important, but less so than Section XI.

The first half of *Désintégrations* begins in a clear manner, slowly grows, and then bursts into activity arriving in Section V on an internal cadence. The cadence is not final, and there is a crescendo at the end of Section V that is suddenly cut off. The second half begins in a clear fashion, as did the first, then moves towards the very active Section VII. There is a gradual relaxation of the tension as the music progresses towards the final cadence in Section XI.

Throughout the piece, Murail uses a deceptive motion at cadential points. In doing so, cadences are often elided into the next passage of music. As in tonal music, the deceptive cadence serves to elongate a structural upbeat. In *Désintégrations*, the upbeats are often extended for an entire section, so that the momentum continues for larger passages of music. This type of motion is reflected in Diagrams 2-14 and 2-17. The cadence at the start of Section IV is elided and the motion is continued until the downbeat of Section V. A more significant example is the repeated elisions that occur in the second half of the work, where the cadences

in Sections VII-X are all elided, making the final cadence at the start of Section XI most gratifying.

Large Scale Relationships in *Désintégrations*

Now that the basic elements of *Désintégrations* have been analyzed, it is possible to demonstrate how the overall musical discourse is established. Murail has stated that the spectra can generate the entire musical structure of a work,⁴⁷ but the piece consists of much more than a succession of spectra. There are other factors that can be examined to help explain the overall shape of the work.

It has already been stated that most spectral works do not utilize thematic material, and are not motivic in construction. The cascading gesture serves to unify portions of the piece by the basic motion of a rapid fall from a relatively high note. This work does not make use of any repeating harmonic elements,⁴⁸ and the rhythmic language appears to be vague at times.

However, remember that spectral music is based on the notion of process, "...a technique allowing the transition from a given state to another within a clearly directional continuum of sound."⁴⁹ Certainly, the states referred to by Sédès and

⁴⁷ Murail "Spectra and pixies." Most of the article discusses Murail's concepts on the relationship between the timbre-chord and the work as a whole.

⁴⁸ This is not to imply that other spectral works do not exhibit repetition. Murail's 1975-76 work *Mémoire/Erosion* is based on a distorted repetition (see Éric Humbertclaude "The challenge of Tristan Murail's work", translated by Jacqueline Rose, *Mikropolyphonie* 3.01. [Internet, WWW], ADDRESS: <<http://farben.latrobe.edu.au/mikropol/volume3/humbert-e/humbert-ab.html>>). Also many of Magnus Lindberg's pieces are based on the chaconne principle (see Risto Nieminen, ed. *Magnus Lindberg*, translated by Nick Le Quesne. (Paris: Editions Ircam, 1993).

⁴⁹ Anne Sédès and Guy Lelong, program notes to Marc-André Dalbavie, *Compositeurs d'aujourd'hui* sound recording, CD Adès 205 202: 1996, 6.

LeLong are the levels of stability found in *Désintégrations* and many other works. The main distinguishing feature of spectral music is the slow harmonic motion often resulting in these states being arriving and leaving in a slow and gradual manner. Consequently, the harmonic elements of a spectral work, and, by extension, the timbral elements appear to be in constant motion. In order to understand a work like *Désintégrations*, it is necessary to examine the methods used to control the large-scale motions of the timbres.

The signification of spectral use

Désintégrations is constructed from timbre-chords built upon spectral principles. The timbre-chords are based on operations upon an overtone series. Sometimes the overtone series is the result of analysis of a natural sound, while other spectra are synthetically created. The foreground analysis of *Désintégrations* established where different types of spectra were used. Basically, there are three different types of spectra used in *Désintégrations*: the natural overtone series, FM chords, and RM chords. There are a number of operations Murail employs on these spectra to change the nature of the timbre-chords.

Each type of timbre-chord has a distinct quality, which may be characterized as stable or unstable.⁵⁰ The natural overtone series tends to be stable, particularly if lower-order partials are prominent. If the partials are filtered in some way, the

⁵⁰ The stability of the timbre-chords is contextual, and somewhat subjective. As discussed previously, the natural harmonic spectrum has been designated as the most stable element in this work, and deviations from the natural harmonic spectrum are less stable.

chord is still stable, but much less so. Chords that are based on modulation are usually less stable, particularly if a high index number is employed, since it results in more partials. Depending on the ratio of the carrier to modulator, the result may be quite dissonant, and therefore unstable. Certainly the chord formed in Section IX, would be extremely unstable, since the result would be a cluster covering more than four octaves.

Murail uses each type of timbre-chord for a specific purpose. Generally speaking, timbre-chords that are more consonant are employed for points of stability, and less consonant chords are applied to create harmonic tension. The natural harmonic spectrum is utilized at points of arrival and moments in the work where stability is desired. The chords opening the work are somewhat stable as are the rapidly moving spectra appearing in Section III. The arrivals in Sections V and VIII are also constructed from the natural spectrum, but the operations employed quickly undermine the stability. The last two sections are distinguished by the prominence of the natural spectra. After a long focus on the trombone E1 spectra, instability is introduced, leading to the final section. The chords of the final section begin at a fairly stable level, and become unstable as the section progresses. The illusion of stability is enhanced by the pedal tone G. When the pedal tone is finally removed, the work loses a degree of stability, causing the final cadence to be a dissolution rather than an affirmation.

Timbre-chords derived from FM and RM synthesis are less stable, yet Murail uses them to create the illusion of stability at certain points. Section II opens with RM chords sustaining for long periods of time. Despite the inharmonic nature of the RM chord, an illusion of harmonic stability is created by the duration (hence,

rhythmic stability) of the chords. As the section progresses, the chords become less stable and the tension builds. The same is true of the FM chords presented in Section VI. After the opening phrases, the texture is deliberately thinned to introduce a degree of stability. During most of Section VI, the FM chords appear stable, and the cascading gesture is the unstable element.

The RM timbre-chord found in Section IX would be an extremely unstable element if it were played all at once. Here is another example of how the texture and the musical phrases can counteract the unstable nature of a chord. Section IX functions as a gradual release of the tension raised during the preceding sections. One would not expect that an unstable RM chord would be used to lower the level of tension, yet that is exactly what happens in Section IX. The tension is released by a series of rapidly descending phrases overlapping to create a blur. The listener is drawn to the lower sustained notes, which eventually focus on the E1. Murail uses the unstable RM chord to bring attention to a stable element. Consequently, the device used at the end of Section IX is quite traditional: an unstable harmony progresses to a more stable one, making the arrival on E remarkably important.

Surprisingly, the moments of extreme activity and tension are not built from FM or RM chords. The rapidly moving passages in Sections IV and VII are constructed mainly from natural spectra (with some interpolation in Section IV). Murail builds the tension in these passages by the sheer force of the musical texture: loud, fast music played by the entire ensemble.

Murail uses the process of spectral distortion to gradually move a relatively consonant sonority to a less stable, dissonant chord. This process is utilized in

Sections V, VIII, and X. The process in Section V is a distortion that results from the interpolation of a natural harmonic series into an inverted spectrum. The distortions in VIII and X are similar in that the chords are ‘stretched.’ In all these instances, the chords are significant points of arrival, and the spectral distortion process serves to undermine the stability of the passage.

In short, the natural spectrum is *generally* used for passages requiring stability, and the modulated spectra are used to create unstable harmonic areas. The musical texture can be used to either amplify or contradict these factors. Certainly, in *Désintégrations*, Murail does not use the modulated chords for the strongest points of stability.

The transformation occurring during a section can easily affect the stability of a passage. The arrivals in Sections V and VIII are quickly destabilized by the use of spectral distortion, and the seemingly final cadence in Section X is disturbed in the same manner. It has also been noted that the less-than-stable RM chords of Section II become less stable as the section progresses. In this case, the stability is affected by changing the elements of the RM chord. The instability increases as the transformations occur more frequently. The end result of a distortion process is quite predictable since it will always lead to a less stable chord.

Generally, faster transformations create a rise in tension in spectral music, as it does in most other music. Wallace Berry points out that the motion away from a primary system will create a rise in the level of tension in a work; an acceleration will have a similar effect.⁵¹ Throughout *Désintégrations*, Murail deftly utilizes a

⁵¹ Wallace Berry, *Structural Functions in Music*. (New York: Dover Publications, 1987), 11.

particular timbre-chord as a point of relative stability (the type of chord determines the stability). When a slight increase of tension is desired, Murail alters the chord in any number of ways. If there is to be a drastic rise in energy, the chords change rapidly, and at moments of high tension, the changes are radical and fast-paced.⁵² Therefore, transformation has a large effect on the stability of a passage, since the type of transformation, the degree of alteration, and rate of timbral transformation will all combine to destabilize the passage in question. In fact, the transformation process has a greater effect on stability than the spectral make-up of the timbre-chord generating the passage.

Rhythm and duration

The rates of timbral transformation bring the entire sphere of rhythm and tempo into focus. Upon first hearing *Désintégrations*, the listener is struck by passages that do not exhibit any discernable pulse. There are many passages in which the pulse is not activated on the surface, or the rhythmic units (meters and surface rhythms) are organized to deny a strong sense of pulse. This type of rhythmic organization would be classified as durational music, since the temporal proportions between the events are organized independently of a pulse. However, Sections IV and VII are definitely pulsed, metric-based music, so *Désintégrations* is

⁵² Such as Section VIII.

not constructed of only durational rhythms. The interplay between durational and rhythmic music contribute to the work's structure and tension/release scheme.

Most of *Désintégrations* is durational. Both halves of the work move from durational to rhythmic and back to durational music. Sections IV and VII are clearly pulsed, rhythmic music, while sections III and IX are pulsed with irregular material placed in the time frames. As is the case with spectral transformation, a clear picture of Murail's rhythmic usage emerges when the interplay between these elements is examined; the rhythmic profile is complete when a study of tempo relations (particularly the tempo fluctuations) is included.

At the opening of the work, the tempo is stable, but the metrical fluctuation and surface activity do not clearly relate to the pulse. Therefore this section is durational. Towards the end of section II, the pulse becomes more prominent, and the tempo begins to fluctuate. Pulsed music is a foreign element to the work, so a reference to a clear pulse would tend to destabilize the passage. In the third section, the tempo remains constant, and the material moves from clearly articulating the meter to a durational micropolyphony. Towards the end of the section, the music begins to exhibit rhythmic characteristics, which forms a transition to the pulsed music of Section IV. This section is rhythmic, but the surface rhythms change in a discontinuous manner, creating *accelerando* and *ritardando* passages within the context of a steady pulse. The result is a very unstable passage, which is followed by a passage (Section V) having a steady and perceptible tempo. The return to a durational rhythmic organization heightens the sense of return to the original state, yet this is undermined by the reference to pulsed music. This concurs

with the other analyses of this section, since Section V is a point of arrival, yet highly unstable.

A similar pattern is created in the second half of the work. Section VI is parallel to Section I because it is durational. It is followed by a section that is pulsed, complete with a steady stream of sixteenth notes. As Section VII unfolds, the pulse is disturbed by the constant *accelerando-ritardando* tempo fluctuations, adding to the instability of the section. Section VIII follows with discontinuous tempo changes, resulting in a jarring switch to durational music. Like Section III, the ninth section of the work begins with a pulsed music leading gracefully to music based on durations. The remainder of the work is durational.

Curiously, Murail presents the durational music as stable in this work. This is because durational music is normally associated with stable harmonic material, whereas rhythmic (metrical) music is associated with less stable harmonies, and is utilized to create excitement as the piece unfolds. The pattern of durations-rhythms-durations is used in both halves of the work, and there is a significant focus on durational music in the closing sections of the work. Whenever the pulse becomes prominent, either the tempo fluctuates or the rhythms become varied. In both cases, the rhythmic music becomes unstable. In doing so, Murail establishes durational music as the referential unit, and rhythmic music as the unstable element. In *Désintégrations*, rhythmic music is employed primarily to articulate moments of tension.

One may argue that the tempo pattern is really slow-fast-slow (repeated for the two halves of the work), which may be only partially true. Perceptually, the

durational music may seem slow in comparison to the rhythmic music, since it does unfold at a much slower rate. However, the durational music is not only slow, it is irregular, which is why a strong pulse is not felt. Irregularity is normally associated with a high level of tension⁵³, yet the durational sections of the work are points of stability. The highest points of tension in *Désintégrations* are indeed faster than the durational portions in terms of surface activity and harmonic changes. However, these sections are deliberately destabilized, so their irregularities are emphasized. There is the problem of passages like the ninth section in which the tempo is not a clear indication of the surface activity. The tempo is a moderate ♩ = 75, but the surface begins with fast moving figures eventually slowing down. The next section (X) continues the same tempo, with a radically different type of music, which can only be classified as durational. One may describe *Désintégrations* as having two halves that have slow-fast-slow tempo relationships, but this description does not accurately depict the complex weavings of tempo, duration, and rhythm. In actuality, the motion is not from slow to fast and back, but from rhythmic ambiguity to clarity and a return to ambiguity. The ambiguous nature of the opening section gives the impression of a slower moving music, but that is not always the case in terms of tempo relations.

Large-Scale Pitch Concerns

⁵³ Irregularity often occurs during moments of tension in tonal music, such as in the development section of a sonata.

Because of the gradual processes in spectral music, it is easy to look at the large-scale unfolding of pitch. Quite often, the fundamental pitch provides an instant focal point of the harmonic structure, even when it is only implied. In sections that are based on inharmonic concepts, the fundamental is not apparent (although an inharmonic spectrum will always have a fundamental, even one that inaudible and thereby ‘imaginary’). This is not meant to imply that the pitch selection in these cases is in any way arbitrary. More likely the general intended result was conceived and the carrier and modulator were selected to create that effect.

The work begins with two spectra a minor third apart, C \sharp and B \flat (or A \sharp). The same sequence appears in the transition between Sections III and IV. The same interval of a minor third also appears towards the end of the piece, in Section X, which opens with a bass motion of G to E.

The minor third appears in two other important chains of relationships. The two spectra opening the work lead to a section with a long G pedal tone, forming the chain C \sharp -B \flat -G. In the second half of the piece, Section VIII is based on the C \sharp spectrum, Section X on E, and the final section on G, forming another minor third chain: C \sharp -E-G. Notice that both these chains end with G, and that each section with the G includes a lengthy pedal tone. The second section ends with the G7 emerging as the common note between two spectra a tritone apart. The importance of the G7 is paramount since it is articulated as the first unison heard in *Désintégrations*. While G is not the overriding ‘tonic’ of the piece, it is the most important note in the work.

Another possible choice for primary notes is C \sharp . However, due to its placement and duration, the C \sharp does not receive ample focus during the work's unfolding. It begins the first half of the work, but the harmonic activity does not focus on C \sharp , and the chord at the end of Section III is too brief to be considered a return. In the second half of the work, the chord produced by C \sharp in Section VIII is unstable. While the C of Section IX is an anchor for the passage, it does not help to raise C \sharp to a degree of primacy. One may also question the possible prominence of E, which plays a significant role in the second half of *Désintégrations*. The E has a long focal point in Section X, and functions as the lowest note in Section VI. The role of E in Section VI is less significant, since the timbre-chords are based on FM (and E would not be perceived as the fundamental), and there is a constant fluctuation between E and E \flat . However, the E is a temporary focal point in the second half of the work. In both cases, G is the goal of the passages in question, since Sections I and X both lead to passages focused on G. The largest scale reduction of the pitch structure would be: C \sharp -(G)-E-G. Diagram 2-18 shows the pitch relations of each section.

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Diagram 2-18 Schematic representation of significant pitch relations in *Désintégrations*. The diagram shows audible and inaudible fundamentals in addition to the lowest notes in Sections II, VI, and IX. Note that there is no prominent pitch in Section VII.

Timbral Organization in *Désintégrations*

Throughout all of *Désintégrations*, Murail makes use of the tension-release model. Tension is raised during moments of excitement, and is released at moments of arrival. Murail builds tension throughout the piece, releasing some (but not all) of the tension, as the work unfolds. Consequently, the new points of arrival (such as Section VI) are less stable than Section I. The ultimate goal of the work is

the cadence at the start of Section XI; it is at this cadence that most of the work's tension is released. Murail accomplishes the tension-release model by skillfully manipulating harmonic (timbral) stability, changing the rate of timbral transformation, and varying texture and rhythm. Of these factors, timbre and timbral transformation rates are primary, while texture and rhythm are employed to articulate the timbre. Murail is able to achieve climaxes and arrivals through the interplay of timbre and articulating factors. Hence, timbre is the primary organizational factor in *Désintégrations*.

The types of chords employed by Murail have a distinct effect on the level of tension in the work. The natural harmonic spectrum is presented in a manner that creates the most stable music. This is true even for the filtered spectra found in Sections I and III. RM and FM chords are less stable, but these spectra are capable of producing stable sonorities. Section VI, which is based on FM chords, begins with a great deal of stability. The least stable chords tend to be chords constructed from spectral distortion or from inversion (as is the final chord in Section V). Significantly, the major point of arrival (Section XI) is a timbre-chord that is constructed from the natural harmonic spectrum.

Additionally, timbral transformation has a significant influence on the tension-release aspect of the work. Since timbres are almost always in a state of transformation, the rate and depth of transformation have a catalytic effect on the stability of a section. There are many examples of accelerating transformations in *Désintégrations*. All of these examples are found at moments in the work where the tension is mounting. The points of highest instability are invariably linked with rapid and profound timbral transformation.

Large-scale pitch motion has an effect on structural levels of *Désintégrations*. The two most significant devices utilized are the descending minor third and the pitch class G. The minor third is introduced at the opening of the work and is used at key points as the piece unfolds. Significantly, the minor third is employed in Section X, as the G-E motion in the bass creates a focal point on the E1. The G has a strong presence in *Désintégrations*, since the only lengthy pedal points of the work are constructed with a G in the bass. As opposed to tonal music, large-scale pitch motion is not the overriding structural factor. In spectral music, the significance of large-scale pitch motion is realized only when all of the processes are combined.

The formal organization of *Désintégrations* is based on the interplay of elements. The components of timbre, timbral transformation, rhythmic usage, and texture, usually in flux, combine to create structural articulations. Murail uses the elements *simultaneously* in order to create maximum variety and maximum impact for formal articulations on both the middle- and background levels of the piece. Each section of *Désintégrations* can now be examined for its usage of the components of formal organization.

The climax of the first section of the work is built from two factors. The timbre-chords are slowly transformed while the chordal attacks are accelerated. The combination of harmonic instability and rhythmic acceleration is a common device to bring about a structural upbeat. Murail uses this technique in several sections of this work, including Section II. The second section begins with a stable chord (in this case, a RM chord) with a lengthy pedal point on G. During the opening passage of Section II, durational rhythms (which were introduced in Section I) and

the slow harmonic transformation induce stability. A destabilization of the timbre-chord and an accelerando of the rate of transformation bring about the climax towards the end of Section II. The remaining portion of the section stabilizes the harmony by emphasizing the notes that are common between the F and B timbre-chords, eventually coalescing on the high G.

The high G that begins Section III serves an important structural and formal articulation. It re-affirms the primacy of G that was established with the pedal tone of Section II, and brings about a closure for the first two sections of the work. Though the major point of arrival in the first half of *Désintégrations* is in the fifth section, the articulation at the start of Section III is still significant.

In the third section the pattern of accelerating harmonic destabilization established in Sections I and II continues. Section III also contains a disruption in the texture, a device that was used previously in the piece. As opposed to the short passage in Section I, the textural disruption in Section III is greatly enlarged, indicating that a larger structural upbeat is being created. Indeed, Section III leads to passages that are the first big climax in the work.

Most significantly, the climax in Section IV comes about on two levels. On the foreground, the increased surface activity is combined with a rapid rate of timbral transformation. Although this device has been used previously in *Désintégrations*, the transformation rate here, as well as the surface rhythms are used with much greater intensity. This serves to create a climax on the surface of the work. Simultaneously, a climax is achieved on a background level through a disruption in the overall rhythmic texture of the work. Up to this point, most of

Désintégrations has been composed using durational rhythms, with only occasional references to metrical music. The second half of Section IV (the ascending chords) is pulsed music, which represents a stark change in the rhythmic nature of the work. The disruption of texture is a device that has been used already in *Désintégrations*, and in Section IV, the same device is being used on a larger scale. In both instances, textural disruption creates an instability that has a distinct influence on the course of the music. The two levels of climax combine to create a major structural upbeat that is fulfilled by the arrival in Section V.

The arrival in Section V heralds a return to a harmonic spectrum. The importance of the arrival is reinforced through the simultaneous use of a stable, sustained spectra (based on the natural harmonic series) and a return to durational rhythms. Harmonic transformation is brought to a momentary halt. Towards the end of the section, the stability is undermined by the timbral distortion, which propels the work forward.

Section VI begins with the less-stable FM chords presented in a stable environment, with a return to durational rhythms for the sustained chords. A climax is created by an acceleration of the timbral transformations and two significant breaks in the texture. The disruptions in texture are the emergence of the trombone/contrabassoon phrases, and the cascading gesture. The rupture in the texture once again indicates a structural arrival, in the form of a climax, is about to take place.

The climax in the seventh section is created on three different levels. On the surface level, the increased surface activity (in the form of rapid sixteenth-note

motion) with tempo fluctuations create instability, similar to Section IV. Like Section IV, the pulsed, metrical music creates a disturbance in the rhythmic activity in *Désintégrations*, since durational rhythms are not utilized in Section VII. However, Section VII does not make use of significant timbral transformation, and there is no distinct pitch center for the section.⁵⁴ These factors place the climax in Section VII as the most intense in the entire piece, easily surpassing the climax reached in Section IV. In all respects, Section VII is the main climax of the work. Everything that follows this climax (except Section VIII) represents a gradual relaxation of the tension generated in Section VII.

Section VIII sustains the upbeat with the unstable nature of the timbre-chords. As discussed previously, the spectral distortion is designed to create a jarring effect, especially when combined with the irregular duration of each chord. After the articulation at the start of Section IX, there is a gradual move towards stability through the use of bass notes that serve as an anchor. These notes eventually move toward the E, which is a significant structural articulation at the start of Section X.

In the tenth section of the work, stability is created through the employment of a natural harmonic spectrum, a return to durational rhythms, and a slow rate of timbral transformation. The transformation rate is so slow at the opening of the section that the listener may perceive it as the final cadence. As the section

⁵⁴ The chords in Section VII are generally repeated in a quasi-random fashion. There are alterations to the chords as they are repeated, but the alterations are in the form of notes within each chordal spectrum. There is also a brief passage where transformation occurs simultaneously with a disruption in tempo, but this is quite short and the chords return to their initial state immediately. Therefore, no significant timbral transformation occurs. As to pitch center, none of the chords are emphasized enough (or at all, for that matter) to determine primacy.

progresses, the familiar device of accelerating timbral transformations creates a structural upbeat that is answered by the downbeat in Section XI.

The beginning of Section XI is a major articulation as well as a significant arrival. It is another re-affirmation of the significance of G, which is used for a pedal. The timbre-chords that form the basis for this section are stable, as they are constructed from the natural harmonic spectrum. Timbral transformation is virtually brought to a halt, since the timbre-chords are each prolonged for many measures. The harmonic stability is gradually undermined during the coda, but the durational rhythms are maintained and the rate of transformation is not significantly accelerated.

All of the schematic graphs of *Désintégrations* have shown a formal division between the two halves of the work, which are maintained in Diagram 2-19. The climaxes in Sections IV and VII form a parallel that clearly define the two halves of the work. The climax in Section IV is followed by the arrival in Section V, which is elided into the distortion that propels the motion into the second half of the work. The more intense climax in Section VII is sustained through Section VIII, is gradually released through Section IX, and leads to the arrival in Section X. However, the two halves of the work are not entirely separate. Besides the elision at the end of Section V, the second half of the work does not start from the same level of stability as Section I. The climax in Section VII comes much more quickly than the climax did in the first half of the piece, and the bulk of the second half of *Désintégrations*

is focused on the resolution of tension. The work exists as a unified whole, but with a significant formal division occurring between section V and VI.

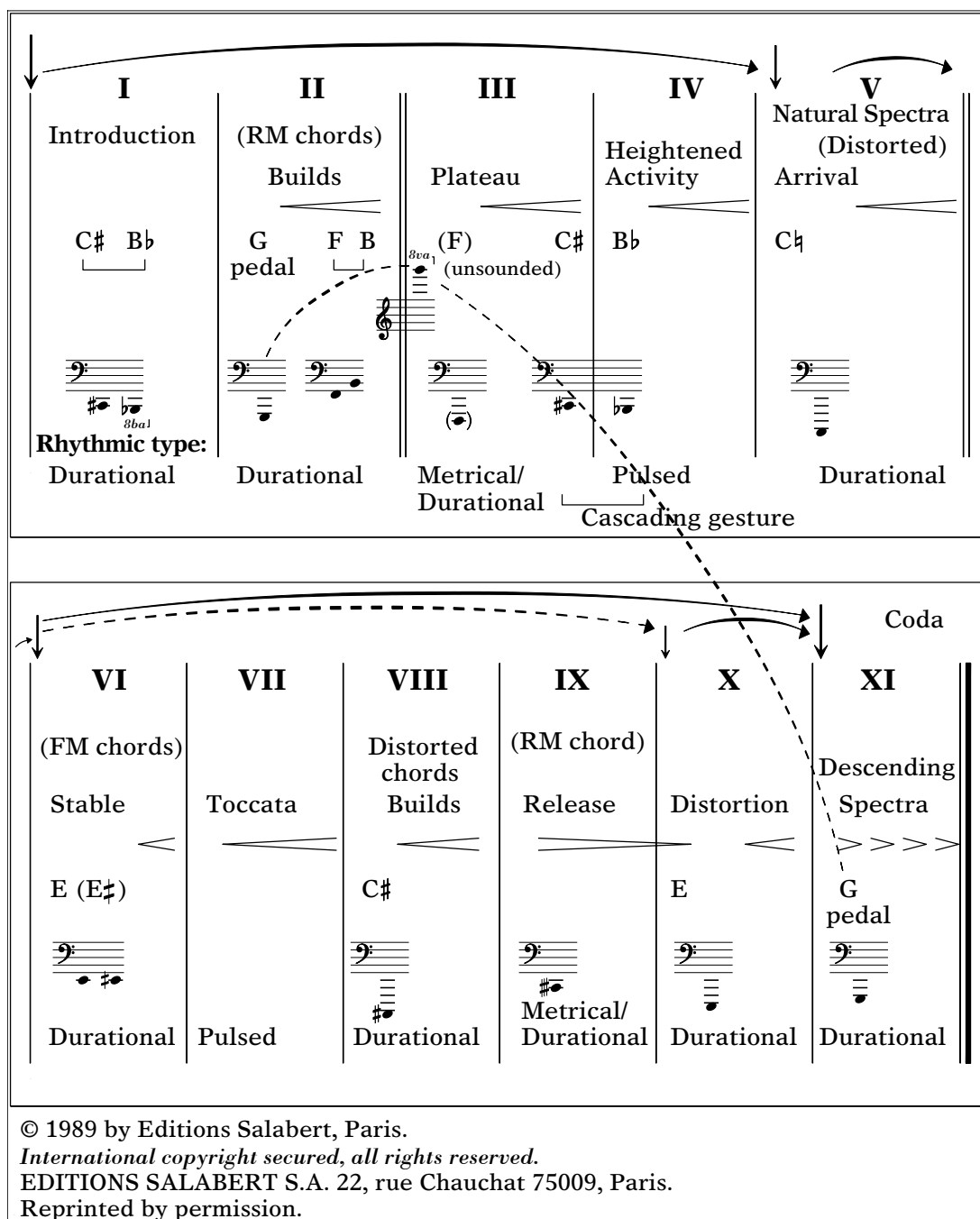


Diagram 2-19 Schematic representation of significant features of *Désintégrations*.

Désintégrations is based on timbres and timbral modulation, but exploits the traditional tension-release model. As the work unfolds, the listener becomes aware that some articulations and arrivals are more important than others; a discernable hierarchy of downbeats is revealed that progress towards the main climax in Section VII. There is a clear cadence at the start of Section XI that concludes the work. This simple formal structure traverses the eleven sections, as the initial downbeat builds into larger downbeats, climaxes, and reaches a final cadence. The tension-release paradigm is the cohesive element in a work that might otherwise seem ambiguous.

The preservation of the tension-release model is an important link to the music of the past. This link is important for the listener as well as for the composer. With the tension-release model, the composer creates focal points in his music, so the listener hears the structural and hierarchical points of interest in the piece. Many twentieth-century composers either deliberately avoid the tension-release paradigm or attempt to evade it. The listener is left unaware of the formal structuring and hierarchy in the music.

Of course, the tension-release paradigm is so ingrained in Western culture that it is difficult for a composer to circumvent. The tension-release model is a basic element of drama, theology, and literature, and is an integral part of all forms of contemporary Western music. Even the radical avant-garde works of Ligeti and Scelsi still adhere to the principles of tension and release; though these composers

were innovative, they realized that the tension-release paradigm was a unifying factor that could not be eliminated from their music.

Murail's Importance to Spectral Music

Like Ligeti and Scelsi, Murail builds climaxes and arrivals through timbral means articulated by texture. Murail differs from these composers in that *Désintégrations'* timbres are almost constantly in motion. Unlike Scelsi, Murail makes use of a larger pitch language within the context of a piece; where Scelsi is content to base an entire movement on a single, sustained chord, Murail is more likely to alter the chord after a few measures. Unlike Ligeti in his 1960s works, Murail utilizes a wider variety of textures within a single work, often changing texture as a beacon for forthcoming structural events. In Murail's music, texture is associated with a timbre-chord; variations in the texture or pitches produce repercussions in other facets of the collective sonority.

The spectral composers extend the timbral lineage by associating a timbre with a harmony *and* a texture, and by keeping the timbre in a state of motion. Timbral activity accounts for the seemingly constant elisions found in *Désintégrations*, as many cadences are undermined by the timbral transformations.

Murail distinguishes himself from the other spectral composers by using shorter sections and pulsed music. Grisey's 17-minute work *Modulations* has been analyzed to consist of three distinct sections, the first lasting nearly 2/5 its total

duration.⁵⁵ The seven-minute portion of *Modulations* is made of a process that is quite similar to the opening passage of *Désintégrations*. Two timbre-chords are slowly transformed into a third chord representing a sonority halfway between the initial chords. In the case of *Désintégrations*, the process lasts approximately two minutes; the arrival in measure 30 of Section I is an intermediate goal for the work as a whole. The corresponding passage in *Modulations* is longer, as most of the seven minutes is spent on the interpolation process creating the final chord. In the Grisey work, the chordal fusion (the end result of the interpolation process) is the main goal of the entire section, and given the weight of the section, a major structural event for the work. Grisey's music, particularly *Modulations*, is more akin to the *idée fixe* works of Scelsi, where one idea tends to dominate huge portions of pieces. Murail's music, especially *Désintégrations* allows for changes in timbre and texture in a much more flexible manner.

Murail also differs from Grisey in the manner of surface rhythms. Grisey eschews metrical music in most of his music, deriding it as 'old fashioned' and 'academic'. Only in his last works did he incorporate metrical music into his music of pure duration.⁵⁶ In *Désintégrations*, Murail makes significant, but judicious, use of pulsed, metrical music; the work would not reach its climax in such a powerful way without this important element.

⁵⁵ Maria de la Cruz Padron Lopez Le-Dilly, "Aspects de la 'music spectrale': *Modulations* de Gérard Grisey" [Aspects of spectral music: Gérard Grisey's *Modulations*], *Mémoire de DEA de l'Ecole des Hautes Etudes en Sciences Sociales*, 1993, 93-109. Quoted in Moscovich, 26.

⁵⁶ Cornicello, 18 June 1998, "*Vortex Temporum*." (Lecture notes).

Murail's Musical Direction after Désintégrations

In the more than 15 years that have elapsed since the premiere of *Désintégrations*, spectral music has continued to evolve, more towards the direction suggested by Murail in this work. Specifically, Murail has moved away from the *idée fixe* and towards a type of music that is more discontinuous and eclectic. Murail's *Serendib* (1991-1992) is, according to Julian Anderson, his most discontinuous work to date, filled with unexpected harmonies that refuse to 'settle down'.⁵⁷ Another piece, *L'esprit des dunes* (1993-1994) utilizes samples taken from Tibetan and Mongolian trumpets and *khöömiy* chanting (the technique used to produce vocal multiphonics).⁵⁸ Murail has also been experimenting with harmonic elements generated by non-musical events, such as the sampled surf breaking against the seashore that became the basis for *Le partage des eaux* (1995-1996).⁵⁹

Younger composers are interested in Murail's techniques and eclectic tendencies. Many younger European composers know the general techniques of spectral music, and some, such as Marc-André Dalbavie and Magnus Lindberg have taken Murail's spectral concepts and mixed them with other musical techniques.

Dalbavie is most strongly influenced by Murail's spectral concepts. Many of his works employ the slow, deliberate harmonic processes that characterize spectral music. He also makes extensive use of timbre-chords, interpolation techniques,

⁵⁷ Anderson, notes to *Compositeurs d'aujourd'hui*. Recording, 19

⁵⁸ Ibid., 26.

⁵⁹ Ibid., 43.

quarter-tones, and references to electro-acoustic models.⁶⁰ Dalbavie's music is marked by the "oppositions it sets up between sound object and transitory process, continuity and discontinuity, speed and stasis,"⁶¹ demonstrating the influence of Murail on his music. Dalbavie shares Murail's interest in discontinuity and eclecticism, as he incorporates minimalist techniques reminiscent of Steve Reich.

Spectral composers have likewise influenced Finnish composer Magnus Lindberg. His music is rich with spectral harmony, and he often utilizes interpolation processes.⁶² Lindberg also shares Murail's taste for the exotic in music, as demonstrated in *Joy* (1989-1990). The sounds of a piano being slowly destroyed (strings detuned by several octaves or being cut with pliers) became part of the harmonic material for the piece.⁶³ Lindberg's music also makes use of pitch-class sets in the manner suggested by Forte; Lindberg delights in the mixture of musical styles and ideas.⁶⁴

Murail's importance to contemporary music is threefold. Primarily, along with Grisey, he created the basic techniques of spectral music. These techniques, which exploit the microcosm of sound itself, provide the spectral composer with a huge variety of rich sonorities and textures. The techniques are both powerful and flexible, allowing the composer to modify the processes to fit the musical needs. The open-ended nature of the spectral processes are of particular importance, since they allow the composer the ability to add in other elements.

⁶⁰ Sédès and LeLong, 6-7.

⁶¹ Ibid., 7.

⁶² Jean-Pierre Cholleton, "Time and force: (*Ur* and *Kraft*)," in *Magnus Lindberg*, ed. Risto Nieminen, 35.

⁶³ Peter Szendy, "The Point of Style (*Joy*)," in *Magnus Lindberg*, ed. Risto Nieminen, 66.

Secondarily, the discontinuous and eclectic nature of Murail's music is of importance to the composers of the late twentieth and early twenty-first centuries. Towards the end of the century, many composers utilize more than one technique in a single piece. Although Murail is not the first composer to employ eclecticism, his music is an excellent example of how cohesiveness can be achieved.

Finally, Murail's legacy can be traced to his application of technology to explore new timbres and textures while utilizing the traditional tension-release paradigm as evidenced in *Désintégrations*. Although other spectral composers employ the tension-release model, Murail does so in a much more forthright manner. This allows him to explore new timbres and textures and yet maintain a clear musical discourse. Murail is not the only Janus-faced composer of these current times, but once again he provides an excellent example of the combination of new techniques (and technologies) with the knowledge of previous music. This may be Murail's greatest contribution to the course of music.

⁶⁴ Peter Szendy, "Interview with Magnus Lindberg" *Magnus Lindberg*, ed. Risto Nieminen, 14-15.