
Sound-objects, Values and Characters in Åke Parmerud's *Les objets obscurs*, 3rd Section

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In volume 12, number 2 of *Organised Sound*, we presented a revision of Pierre Schaeffer's spectromorphology adapted to practical analysis. The present paper shows the steps of applying the proposed method of analysis to a specific work by the Swedish composer Åke Parmerud, as we pursue the application of two other central terms in Schaeffer's analytical work, namely 'caractère' and 'valeur'. Whereas 'sound-character' would refer only to a timbral constant that supports pertinent values, we identify a form-building entity, termed integral sound-character, consisting of a union of sound-character and its temporal behaviour.

1. INTRODUCTION

In his *Traité des objets musicaux* (1966) Pierre Schaeffer did not only define the sound-object and propose ways to classify it. He proposed a model that was supposed to ensure the unity of a sonorous discourse diversified by structurally pertinent values; it was defined by a pair of mutually dependent musical features, termed *character* and *value*. Moreover, he insisted that concrete, experimental research was what was essential in order to lay the foundations of a new kind of music that availed itself of the new sonorous resources discovered.¹

In view of the development of music during the half-century that has passed since then, one may conclude that the further development of electro-acoustic music did not proceed in the research-based manner that Schaeffer had envisaged. Most composers considered research on characters and values a futile exercise; the younger composers in his group preferred to experiment and compose only guided by their musical instincts. Their resistance to his rigid, research-based approach may have been musically justified as in fact a new musical style, the acousmatic music, emerged. However, a few theoretical issues proposed by Schaeffer such as that of character/value were left unresolved in his wake, and deserve a closer scrutiny.

¹Schaeffer envisaged a field of research, called 'acoulogy'. '... in the last analysis, acoulogy is the study of the hypothetical logic of the material at the most elementary level; a logic which we assume to be potentially rich enough to dictate the laws of a structure without a code' (Chion 1983: 96).

2. CHARACTERS AND VALUES

Pierre Schaeffer's hypothetic formula for how sounds support musical structure consists of two inter-dependent elements: *value* and *character*. The *values* are the features of a given sound-character that through their differentiation form the pertinent elements of musical structure; the *characters* are the remaining, less changing, more repetitive features of sound, those that do not constantly change but through their static quality serve as a common background facilitating the integration of the differential values into a unified pattern. The analogy with the relation between pitch and timbre in traditional music is evident. Michel Chion adds further clarification to the concepts by saying:

Values are the *pertinent* features emerging between sound-objects integrated into a structure, and forming the elements of an abstract musical discourse; the other features of the object that are not pertinent in the musical structure but constitute its concrete substance, or as it were, its matter, are collectively referred to by the concept of *character*. The model of the relationship Value/Character corresponds to the couple Pitch/Timbre in traditional music. Pitch is anyway the privileged value in most of the traditional musical systems ... The law of the complementary relationship Value/Character can be expressed in this condensed formulation: '*The objects are differentiated in values through the mediation of their resemblance in character*'. ... In other words, the value only exists from the moment when there is more than one object, and when between several of these objects there appears a difference of the same aspect, the same property common to them all. The resemblance in character among the sounds facilitates the perception of the values they support, and contributes to '*weaken the interest one easily would direct towards the identification of the objects, which otherwise would present themselves as a series of heterogeneous events*'. (Chion 1983: 70–1; John Dack's translation).

The resemblance in character is the timbre that is being repeated for every new occurrence of the musical value; it forms a homogenous ground for the emergence of the pitch dimension. The repetition of the same instrumental timbre has the effect of neutralising the attention that otherwise would be

spontaneously directed towards the identification of the concrete cause of the sound (indexical listening). The instrumental timbre functions as the supplement – the ground – that allows abstract values to emerge. The character in its prototypical definition is therefore the first abstraction of the instrumental timbre in the direction of a generalised musical function. The couple character/value, then, is modelled on the play of a musical instrument. In Schaeffer's definition:

Every device from which a varied collection of sound-objects – or various sound-objects – can be obtained, whilst keeping in the mind the permanence of a cause, is a musical instrument in the traditional sense of an experience common to every civilization. (Schaeffer 1966: 51; John Dack's translation)

Thus the perceptual pattern of permanence in timbre combined with variation of an emergent sonorous feature is founded on the experience of the musical instrument.

The couple character/value is more or less doubled by another couple of concepts: *genres/species*. The latter couple comes as a part of Schaeffer's grand unifying scheme (labelled TARSOM; Schaeffer 1966: 584–7). On the vertical axis of the scheme he lists seven criteria of perception, on the horizontal four orders of approach to these criteria (*types, classes, genres, espèces*). Under *genres* (defined as 'caractèrologie musicale') he intended to group sound qualities fit to serve as sound-characters, under *species* the specific features of these sounds that could be organised along scale-like criteria so as to form values.

The genre of a sound (or its character) is defined by a certain combination of criteria, a 'bundle of criteria' which characterizes it; it defines a physiognomy which is simple, immediately perceptible yet complex to analyse. ... In other words, the sound is not a sum of features, simple independent criteria; these features are combined and interdependent.² (Chion 1983: 104)

The genre opens for a play on differential values:

Generally speaking, the combination (lit. 'synthesis') of musical objects ... would aim at the production of series of objects of the same genre leading to the emergence of a variation of a pertinent feature between them, or a value. In this sense, genre becomes synonymous with

²I have chosen, throughout the text, to use the term 'character' as translation of the French 'caractère'. John Dack has consistently translated it with 'characteristic'. My reason for choosing 'character' is that this word suggests – among a number of related meanings – 'an aggregate of features and traits that form the individual nature of some person or thing'; this seems to match Schaeffer's idea that a genre, which is more or less the same as 'caractère', is a bundle of criteria. The term 'characteristic', on the other hand, usually refers to one selected feature that helps to identify, tell apart, or describe recognisably a certain person or thing, thus representing a distinguishing mark or trait. 'Characteristic', then, seems to be a term that is better suited for the description of a singular quality rather than a composite one. In fact, a value may be the characteristic of a character.

character, in the sense of the concrete, sonorous, instrumental aspect of the sound rather than its abstract aspect, which functions as a musical value. Genre would then play a role equivalent to the timbre of instruments. (Chion 1983: 104)

Since Schaeffer's idea to work out inventories of suitable musical objects organised in genres ('characters') and species ('scales') has not seemed to be a viable approach neither to the production nor to the analysis of acousmatic music, the terms genre/species will not be used further in our analytical terminology. However, his concern for integration and diversification, and the preservation of identity in a manifold are issues that cannot be dismissed as unimportant to any composition. After all, what is involved in Schaeffer's definition of character/value are basic gestalt principles. One is the *law of similarity*: 'When more than one kind of element is present, those which are similar tend to form groups' (Katz 1951: 25). The other has to do with the definition of foreground and background. Schaeffer's own paradoxical formulation was: 'That which varies is what remains constant' (Schaeffer 1966: 303). The gestalt principles involved are:

if the conditions are such as to produce segregation of a larger and a smaller unit, the smaller will, *ceteris paribus*, become a figure, the larger the ground ... the figure would be defined by the greater density of energy ... those parts which have the greater internal articulation will, *ceteris paribus*, become figure ... The ground is simpler than the figure. (Koffka 1963: 177–210)

These considerations will be pursued and assessed in the discussion to follow.

3. A SPECTROMORPHOLOGICAL ANALYSIS OF *LES OBJETS OBSCURS*

For the purpose of demonstrating the use of the spectromorphological notation presented in Thoresen 2007, and in order to discuss further the application of the concepts of characters and values, we have chosen *Les objets obscurs* (1991) by the Swedish composer Åke Parmerud (b. 1953; Movie example 1). The work consists of four parts, of which we have analysed the third. The piece was composed and produced in the studio of GRM in Paris, and is dedicated to the founder of this organisation, Pierre Schaeffer.

3.1. Spectromorphological transcription of *Les objets obscurs*

The process of analysis consists in the aural identification of the typology of the sound-objects; as explained in Thoresen 2007, this presupposes a reductive listening intention. Figure 1 shows the final

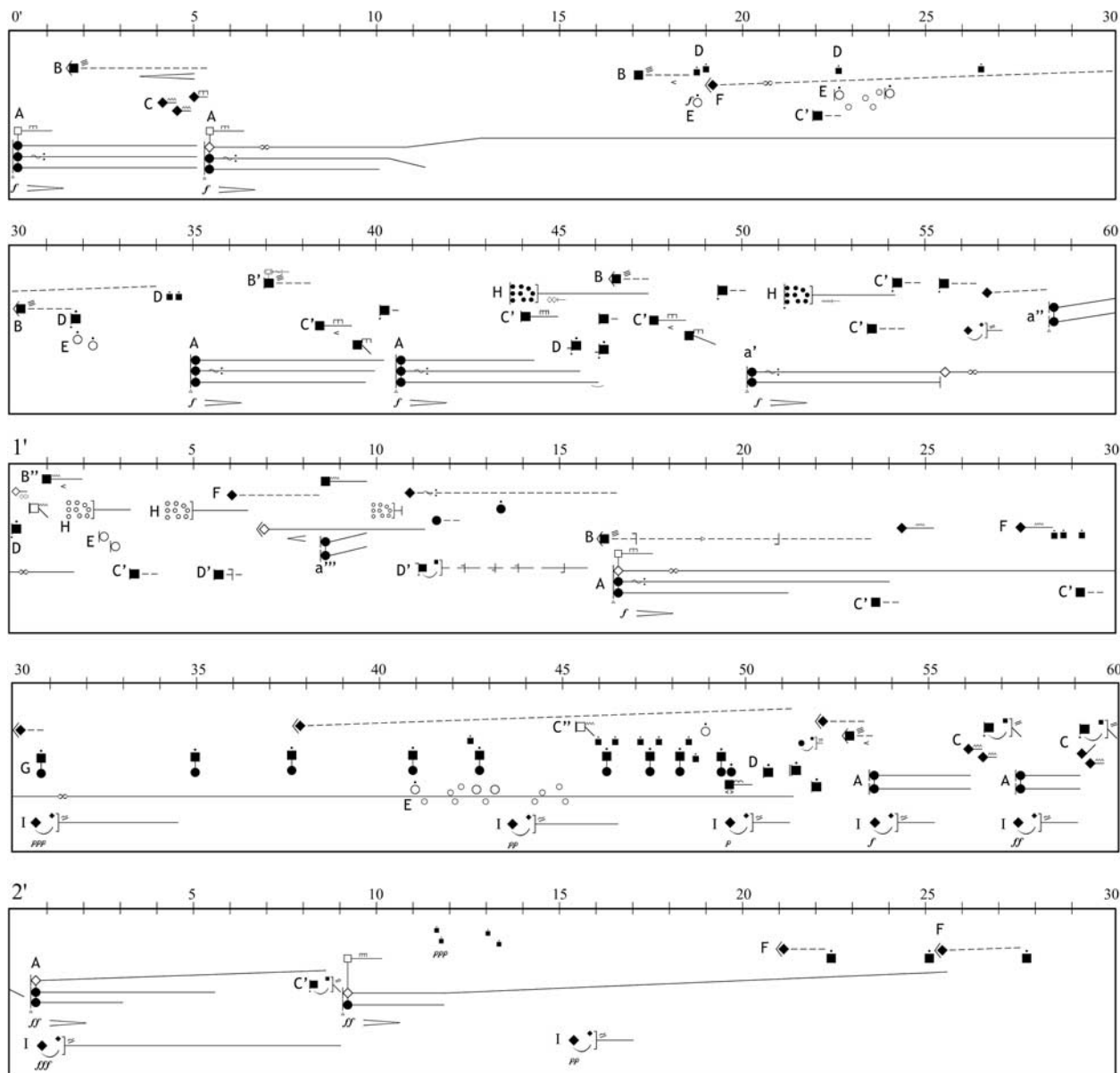


Figure 1. Spectromorphological transcription of *Les objets obscurs*, 3rd section.

spectromorphological transcription of Parmerud’s piece notated with the Sonova³ font. The result we present is a listener’s score – in other words, a *descriptive* representation of what is heard. A traditional score, on the other hand, would be *prescriptive* – in other words, used for reproducing the music.

The score follows a time line, but chronometric time measurements are not an intrinsic aspect of the analysis, which is based on the music-as-heard. In a few instances the placement of the signs show slight deviations from an exact placement on the

time-line; the signs may have been somewhat compressed to suggest a musical time-field. The analysis is an example of a compact notation of all sounds in a single system, where the pitch (or brightness) axis goes from low to high; however, it cannot always be exactly maintained due to practical reasons, as for example when there are simultaneous occurrences of many sounds in the same register.

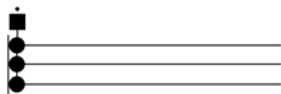
3.2. Discussion about analytical choices made in the analysis

The present approach to analysis – indeed most forms of analysis – transfers information from a concrete reality with an almost infinite number of shades and nuances, into a conceptual space with a

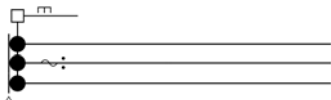
³The Sonova font enables the analyst to enter all the graphic signs of the revised spectromorphology, in a text-based digital document. The graphical examples in this article are written with this font, originally developed by Andreas Hedman.

limited number of distinct positions and categories. Accordingly, the analyst will have to decide how to divide continuous phenomena in order to assign them to discrete, conceptual categories. A brief discussion about how ambiguous cases have been resolved may be useful, and is found below. Please note that the time indications in seconds start after the reading of the French text (i.e. after approximately 18"), and will therefore differ correspondingly from the seconds showed when playing the CD recording of the music (Parmerud 1994).

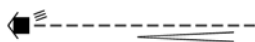
- [0"] The music starts with a chord of several *pitched* sounds. The attack of the chord contains a *complex impulse*. This could have been explicitly indicated in notation as shown:



However, the notation can be simplified by using the sign for *brusque attack* already indicating an attack containing a transient sound with a *complex spectrum*, separate from the continuation of the sound. Further, the *pitch gait* symbol has been used to capture the instability of the spectrum of the chord. The sign of a *spectral gait* would have been more adequate, but is hard to accommodate graphically. In the background, sounding simultaneously with the chord, there is a faint rattling. Since it may be heard as belonging to the spectrum of the chord, we have chosen to notate it thus:



- [1.5"] A *complex, rapidly iterated* sound is gradually increasing in intensity (a crescendo), leading up to the onset of the next chord:

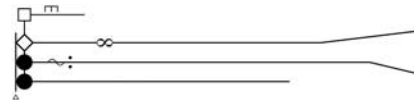


- [4"] The three sound objects just before the next chord are notated as *dystonic*, because they have a very vague pitch quality of a somewhat 'metallic' nature, but they are on the border of being characterised as *complex*. The first two have a medium *granularity*; the last one has got *coarser* and *slower grains*, bordering on *iteration*. It is nevertheless notated with a sign for coarser grains to show its resemblance to the two previous objects in the group:



- [5"] As the chord gradually fades out a dystonic component comes to the foreground. The ascending glissando has a somewhat 'noisy' timbre. As it

does not have a dense spectrum, the unfilled symbol (for 'unvoiced' sounds) is used:



- [17"] An iterated sound, very much like the one at [1.5"] leads up to a short *pitched impulse* and two *complex impulses*. The pitched sound is simple in nature, not really a sine tone, but without prominent overtones. The second complex impulse is slightly *brighter* than the first. As they are both very brief, they do not have an onset. Although the onset sign could have been used here to transmit to the reader the perceived abruptness of these sounds, this would not have been in strict accordance with the definitions pertaining to onset notation:



- [22.5"] Here is a group of short, pitched sounds, a *cell* listed under Schaefferian special cases, in which the first and the last ones are accentuated. Although they are not pure sine tones, not least because of the sharp, somewhat complex attack, they make up a border case and are notated as *pitched components*. The *cell* could also be notated as a *compound object*; however, since these objects are separated and do not really fuse, that notation is not used here:



- [31.5"] This sound, although brief, nonetheless has a short resonating body. In this case it is appropriate to combine the sign for a *sharp onset* with that of an *impulse*:



- [38" and 39"] These two sounds are actually a bit more intricate than the notation would suggest. Given their briefness, it was thought that a simplified notation would suffice:



- [1'1.5"] For this *accumulation*-type sound, the open version of the pitched sign is used (Example 10):



- The spectrum of the constituents is much simpler (sinusoidal) than those at [43"]. The sound reoccurs at [1'4"] and as a short interrupted fragment at [1'10"]:

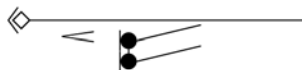


- [1'8.5"] Here the *complex granular* component is notated as a separate sound, since it has already

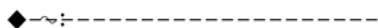
been presented individually at [1'1'']:



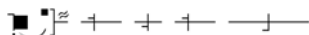
- It can also be noted that the *dystonic* part of the characteristic chord is here presented before the onset of the pitched part (at [1'8'']). The internal structure of what was previously perceived as one sound object is here revealed:



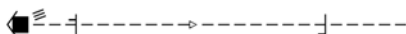
- [1'10.5''] A simplified representation of two sonic events is used here. The sounds are similar in timbre, the first slightly higher pitch, the second an iteration varying in pitch:



- [1'11''] A series of *short, complex impulses*, grouped together as cells. The chosen notation is an attempt to reduce the clutter that would result if each one were notated individually. The wide differentiation in brightness (or register) of the individual sounds is here shown with the use of the signs for spectral brightness. The broken line signifies separation by silence:



- [1'15.5''] The notation of the *spectral brightness* is here used in the proper manner. We hear a gradual transformation in the complex sound, from bright to dark, without the main body of the sound changing register:



- [1'30.5''] Dystonic sounds appear in a polyrhythmic setting. This is rendered by the sign for *oblique pulse*. This first occurrence is very much in the background, but the sounds are repeated with gradually increasing intensity until it reaches the climax at [2'0.5'']:



4. CHARACTERS AND PLAY

Based on the transcription shown in figure 1, the sound-objects identified may now be sorted into *sound-characters*. A sound-character establishes a timbral 'family' of sounds that more or less spontaneously group themselves by virtue of their similarity. Since the identity of the sound characters are recognisable despite variations, they take the role as elements in a higher-order form. In a *sound-based music*, they in fact may take the same role as a theme or core motive in *interval-based music*.⁴ The piece can be

⁴The term *sound-based music* typically designates the art form in which the sound, that is, not the musical note, is its basic unit. A liberal view of sound-based artworks would indicate it to be a

heard as being composed by the interplay of nine sound-characters shown in figure 2. The features singled out for differential play (the 'free variables of the sound-character' with which the composer can 'play'), are described in the third column.

4.1. Analysis of characters and values

Being a case of sound-based music, this piece avails itself of *relative* differences of values: fixed intervals play no role, except to some degree in 'I', where rhythmic time intervals based on periodicity are perceptible. Usually, in interval-based music, it is the play with the intervals that constitute the pertinent features of the music, not the timbre or the tonal background elements; thus the structuring of the music happens not between characters (timbres), but in the play with the values (pitches, durations) supported by the characters. In traditional music the structural discourse consists in motives, melodies, harmonies, themes; the timbre of the instruments playing the music serves a subordinate role. However, in sound-based music using relatively short sound-events *the differential play with the single elements usually establishes no identifiable pattern of its own; it is the difference between characters that clearly is the most prominent aural feature while the play with the values within each character establishes no 'structure', nor any recognizable identity*.⁵ Therefore, the play with the differential values serves only a subordinate role in creating variation while the sound-character is the dominant element of the two in that it represents the listener's primary focus. The function of the play is, using a word that evokes Schenker's theory of tonality, *prolongation* – in our case not of a tonality but of a timbral character and behaviour. Accordingly, the character of the sound-object (its timbral dimension) and its prolongational, temporal behaviour can be subsumed under the same

(*F'note continued*)

subset of music' (Landy 2007: 17). While we adopt the term 'sound-based music' from Landy, we would characterise its opposite as 'interval-based'; Landy calls it 'note based'. We define a musical interval as an objectified, transposable difference between sounds. In addition, there is a culturally shared agreement about the perceptual criteria that define this differential quality. Since intervals may also be formed in the rhythmic domain, rhythmic music based on periodic pulse hierarchically would be considered interval-based. However, since most music is not really pure, it may eventually be necessary to define mediating categories (e.g. the use of pitches as found in dodecaphonic music, and music such as Stockhausen's *Gesang der Jünglinge* that combines serially composed lines with pitched or pitch-less sounds).

⁵Despite the lack of exact interval categories, value-based 'structures' may nevertheless be formed by means of pitch contours or rhythmic contours; one may moreover assume that if such contour-patterns were formed, they would be capable of passing from one sound-character to another. This, however, does not happen in Parmerud's piece, nor does it normally happen in acousmatic music.

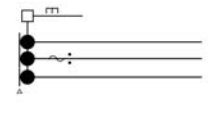




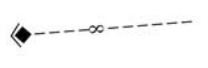



Motive index	Sound characters	Differential values; 'play'
A. 	An 'Enlarging Sound' ('Grosse Note') consisting of a chord with an overall dystonic character, supposedly built up by pitched sounds; brusque attack (i.e. attack with complex impulse); rough grains in the upper part of the spectrum; variable mass (ascending glissando).	Placement in register, duration. The full object includes an ending consisting of gradual reduction of the thickness of the chord combined with a diminuendo and an upwards glissando. The ending may be abbreviated for the sake of repeating the chord.
B. 	Complex sound; high speed iterative.	Duration; dynamics (crescendo or stable).
C. 	Dystonic, sustained objects, gesture time, with rough grains, often with crescendo and combined in cells.	Some have a fixed sonic substance, others are shaped as glissandi; the degrees of granularity vary.
D. 	Complex impulse with sharp attack.	Small differences in relative brightness; relative time differences.
E. 	Single sinusoid and pitched impulses.	Pitch and duration are varied.
F. 	Dystonic, iterative, in ascending glissando, ambient time; often with inaudible attack; upper/middle register.	Durations vary. Sometimes stable tonic substance.
G. 	Synchronized impulses of complex and tonic substance, forte.	The time distance between objects is varied.
H. 	Accumulation of tonic impulses, or sinusoid impulses.	The activity tempo as well as the dynamics of the accumulations vary in an undulating, slightly irregular manner, sometimes disappearing completely.
I. 	Composite object with dystonic objects in markedly oblique rhythm; ostinato.	The rhythmic motive comes and goes, dynamics being an evident variable.

Figure 2. Sound-characters and differential values.

category: we propose that the *union of sound-character and temporal behaviour be termed integral sound-character*. Whereas 'sound-character' would refer only to a timbral constant that supports pertinent values, the integral sound-character refers to the identity of a complex object by including the temporal behaviour, and its variations, and may contain a number of constituent sound-events of different spectromorphological categories. The successive elements in the integral sound-characters (e.g. an accumulation) may only show relative and non-pertinent differences between themselves, but contribute to the formation of the integral sound-character as a whole.

Our considerations about values/characters may be illustrated by means of a few, simple formulae. The original Schaefferian hypothesis of the interplay between structural values unified by a sound-character may be represented as follows:

$$\frac{v_1 + v_2 + v_3 \dots}{k}$$

The v's stand for value: the differential elements whose organisation is what usually is called musical structure. The k stands for character – the timbral aspect of the sound that serves as a common denominator of all the v's. Elements notated as numerators are supposed to have foreground attention; the character, by virtue of

being repetitive and less changing, assumes the role of a background and is notated as denominator. The '+' signs would indicate combinations of v , both successive and synchronous ones.

Interestingly, this simple formula is homologous to Schenker's idea of tonal prolongation: a static or slower background element – the *Ursatz* – integrates a faster moving foreground.⁶ Moreover, a similar structure is identified in the analysis of structural semantics in a literary discourse; here the same structure is called *isotopy*.⁷

However, it is the sound-character itself which in Parmerud's piece attracts the foreground attention. This is in blatant contradiction to the assumptions that Schaeffer built into his philosophy of values and characters: he insisted that the sound-characters were to form the unifying backgrounds of pertinent structure supposed to emerge as foregrounds from the interplay of values; the latter emergent qualities were to be the real substance of the musical play and organisation, not the sound-characters as such whose repetition and constancy were to lead the ear away from the timbre which so often directs the attention towards the causes of the sound (indexical listening). Thus the formula proposed above, suggesting a complementary distribution of priority between character and values, is not at all adequate to describe this structure of the present music. It rather seems we have got:

$$K_1(v_1, v_2, v_3...) + K_2(v_1, v_2, v_3...) + K_3 \dots \text{etc.}$$

As the formula shows, the common denominator is lost; instead we have a series of disconnected integral sound-characters (K), each with their characteristic timbre and temporal behaviour in time (v). Now, if the sound-characters themselves act as some kind of macro-values, what would then be their common denominator – the 'super-character' of the individual characters? The characters do not of course form fixed intervals between themselves, but in order to

⁶Defined in a very general way, prolongation in a Schenkerian context is the extension of an underlying note (or interval, or chord) by the introduction of additional notes. What is ultimately prolonged is the tonic, the simplest and most essential part of the *Ursatz*. Prolongation in a narrower sense is defined as 'the way in which a musical component – a note (melodic prolongation) or a chord (harmonic prolongation) – remains in effect without being literally represented at every moment' (Forte and Gilbert 1982: 142).

⁷A. J. Greimas has borrowed the term isotopy from the domain of physical chemistry and translated it to semantic analysis by conferring on it a specific signification in the context of its new field of application. In its operational character, the concept of isotopy first of all designated iterativity throughout a syntagmatic chain of classemes which assure a discursive utterance [discourse = *énoncé*] its homogeneity. From this definition, it is clear that the syntagm joining at least two semic figures can be considered the minimal context allowing the establishment of an isotopy. Thus, regarding the semic category which subsumes two contradictory terms: the four terms of the semiotic square [*carré sémiotique*], when we take into account the trajectories to which they can give rise, would be called isotopies.' Introduction by Ronald Schleifer to Greimas 1983.

integrate into a reasonably organic form, – to 'speak together' – they must anyway not be too different. Thus a new investigation is called for: what are the relationships between the different sound-characters?

4.2. Relationships between the different integral sound-characters

A closer scrutiny shows that the various sound-characters in Parmerud's piece are indeed interrelated. One sound-character serves as the core of the entire piece, the one that is the most pregnant in the sense that most of the other objects may be derived from it in some way or other; one that also is being prominently and repeatedly exposed in the composition: it is the opening chord, labelled 'A'. Its main occurrences that seem to signal the beginning of the main temporal divisions of the piece are all well prepared in the context. Sound-character 'A' is related to sound-character 'B' in that the latter seems to emerge from the granular upper spectrum of 'A'. The iteration of 'B' can possibly be construed as a slowing down of the granularity of 'A'. The dystonic spectrum that characterises 'C' can be seen as related to the overall sonority of 'A' as a chord. The brusque attack of 'A' may be conceived as the source of 'D' (complex impulses). 'G' represents a further development and synthesis of impulses, creating a new 'chord' when complex and tonic impulses are synchronised. The introduction of the clearly pitched impulses of 'H' is anyway a relative contrast to the sonority of 'A'. The sound-characters 'E' and 'H' may, however, be heard as vaguely related to the granularity of 'A', by means of a (virtual) slowing down and enlargement of the sonorous grains. 'I' may be considered a reduction or temporal ordering or clarification of 'H' into an ostinato in oblique pulse and ripple time, even suggesting the existence of time intervals in one layer of the music. The emergence of 'I' in the last third of the piece is among the more exiting occurrences that happen in the temporal unfolding of the piece, at once organic and unexpected. Figure 3 sums up these properties.

Figure 3 makes it clear that characters 'B' through 'H' are, more or less, isolated features of the core character 'A', which serves as a *super-character* for all the differential, integral sound-characters of the piece. This function is reinforced by the fact that 'A' often serves as a background to the other sounds that seem to emerge from 'A' or to move within its spectrum. Schaeffer's theory posits that the character serve as an *implicit* background. While this is not the case in the present piece, a unifying background for the various *integral sound-characters* is nevertheless present, but now as an *explicit* background. We may illustrate this new constellation through the following formula:

$$\frac{Kv_1 + kv_2 + kv_3 + \dots kv_n}{Kv_1\{k_2 + k_3 + \dots\}}$$

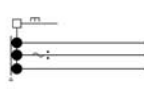
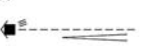


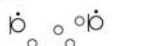
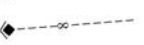


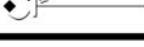
Integral Sound Character	pitched	dystonic	complex	impulse	iterative	accumulation	composite with oblique pulse	variable mass	rough grains
A. 	+	+	+	+	+/-	+/-	-	+	+
	(components of the 'chord' may be heard as pitched)	(through an overall character of a 'chord')	(attack and iterated grain)	(Brusque attack containing complex impulse)	(Only suggested by rough grains)	(Only suggested by rough grains, complex substance)		(Ascending glissando)	(In upper part of the spectrum)
B. 			+		+				
C. 		+/-	+/-					+/-	+
D. 			+	+					
E. 	+			+					
F. 		+			+			+	
G. 	+		+	+					
H. 	+					+			
I. 		+					+		

Figure 3. Relationships between the integral sound-characters.

Here **K** designates a super-character: a special case of an integral sound-character. The **K** occurs in the numerator, since it is exposed in the foreground as one integral sound-character (**Kv₁**) among others (**kv₂** etc.). It is also found in the denominator because of its function as an explicit background. The following bracket shows that it contains elements of other integral sound-characters **k₁**, **k₂**, **k₃**, which account for its integrating function. Its background function is not as an intrinsic quality with all the sound-events, but as a separate layer that overlaps other sound-characters. If it were not for **Kv₁**'s function as an explicit, static background for the other sound-characters that momentarily attract the attention as foreground, the similarities between the sound-characters would have been so remote that a listener would have been unable to perceive their relationships, to the detriment of the overall musical cohesion and sense of form.

5. PRINCIPLES OF ORGANISATION IN LES OBJETS OBSCURS

Schaeffer proposed that timbre, an elementary perceptual quality on the level of sound-objects, could

take the role of tonality in providing an element of integration and prolongation.⁸ Moreover, we pointed out previously that the formula values/character was structurally similar to Schenker's formula of *tonal* prolongation; since his work was confined to interval-based music he placed the integrating background on the more abstract level of sound-patterns. The analysis of this piece, however, has shown that the use of a super-character in order to integrate other sound-characters has shifted this formula to that of *form-building patterns*: as a *layer constellation of an active foreground over a more passive background*. Moreover, integral sound-character 'A' is singled out as the equivalent of a traditional theme that serves to orient the discourse around a centre.

⁸It is fair to mention at this point that, while Schaeffer insisted on the couple values/character as being fundamental, the concept of character is not limited to be being represented only by one timbre; it may also be represented by a class of similar timbres. Abstracting the concept of character further, he even suggests that the constancy of a perceptual dimension in which the pertinent values are found can substitute for any constancy with regard to timbre (Schaeffer 1966: 373-4). However, neither of these abstractions makes any difference with regard to the conclusions drawn in this article.

This way to organise the spectromorphological discourse may be characterised as *centric* (Smalley 1997: 116). It seems to be one viable approach for a composer who would like to maintain a degree of structural consistency and organic unity in his music. The centric strategy for interrelating sound-characters shown above (one pregnant sound-character that is mirrored in smaller entities, plus one subordinate contrast) is actually one exemplary solution for the integration of the objects into an overall, organic form pattern. Since it can accommodate an infinite number of specific integral sound-characters, it may serve as one model, though certainly not the only one for creating and integrating differential sound-characters into an organic whole.

Summing up the analysis, we note that in Parmerud's piece there exists a vocabulary of sound-characters with subtle similarities (and a subordinate contrasts), and a way to vary each character through a play with subordinate, relative values. Through this combination of timbral and temporal characteristics *the integral sound-character* is formed, an entity capable of a varied prolongation, and of being recognised as an identical entity between other *integral sound-characters*. The existence of a *pregnant* sound-character containing features from the total ensemble of sounds employed, is indicative of a centric organisation principle that facilitates a compositional project directed towards the creation of organic forms. By exposing this object repeatedly and in moments when it attracts focal interest, the listener is given the opportunity to perceive its inherent richness of sonorous details which are subsequently fragmented and distributed in the other sound-characters. By also letting it resound as a background layer for the other related sound-characters, the composer enhances its role as an integrating factor, a reference against which other sounds are appreciated. The problem of the weak integration of the sounds elements on the level of sound-patterns (intervals, chords, motives, rhythms, etc.), is then resolved by an explicit exposure on the level of form-building patterns, as the opposition between layers with foreground and background characteristics, and enhanced by the subtle similarities between the timbres. Thus the Schaefferian notion of characters and values, hardly functional on the level of sound-objects, has reasserted itself on the level of form-building patterns.

6. POST-SCHAEFFERIAN OBJECT DEFINITIONS

Our previous and present articles have shown that the ideas of Schaeffer are fruitful for the development of analytical approaches to sound-based music, but not adequate without certain modifications. The

need to go beyond Schaeffer's concept of the sound-object has led a number of analysts and composers to define object categories other than Schaeffer's sound-objects. A question that needs to be discussed is whether the new concept of integral sound-characters proposed in this article really is different from various proposals to defining musical objects and entities occurring in sound-based music.

The so-called 'unités sémiotiques temporelles' (UST) is an approach to the categorisation of sonorous units, developed at MIM (Le Laboratoire Musique et Informatique de Marseille) (Delalande 1996: 21), with a particular focus on the temporality and endosemantics of sound-events.⁹ The morphological description criteria of the UST's temporal behaviour represent an interesting development of the description of sound events that actually could serve as a further conceptual tool for the description of the integral sound-characters. The removal of timbre, though, makes the UST decidedly different from our definition of the integral sound-character which includes a detailed morphological description of the sonorous substance ('masse sonore'). If that is removed, it is hard to answer fully the questions that are of importance both to Schaeffer and us, namely what could be the criteria that function as integrating factors of the music. As to the semiotic aspects of the UST, they seem first of all to be endosemantic descriptions, referring to the contextual implications and expectations that the units create in a listener. Endosemantic descriptions and their structural implications have also been dealt with by us in terms of 'contextual meanings' (Thoresen 1985, 1987). By adding a whole typology of velocity to the description of sound-objects, our spectromorphological notation also goes further than Schaeffer does in describing the internal temporality of sound-events.

Denis Smalley (1997) is also concerned with a classification of functions and expectations in sound-based music. While Smalley provides various conceptual models for temporality, functions and interrelations he does not provide many clues as to how he regards Schaeffer's typomorphological categories; the categories he himself proposes are few and not capable of a detailed description of the morphology of single sounds. We would think that our revision of Schaeffer's typomorphology (Thoresen 2007) could well provide a potential for a more detailed description of sound-events that enter into his higher-level, abstract categories of sound-patterns. As with the UST approach, Smalley's models might actually be of

⁹Exosemantic content structures within music refer to extramusical sound events ... Endosemantic content structures consist of musical references to sound structures (e.g. motifs or themes) which exist within music only ... The discussion of these structures is sometimes restricted to *intramusical* references (to sound structures within one composition)' (Nöth 1990: 431).

use in our context for further definition of integral sound-characters. One enriching insight that stands out clearly from his work is that the character, the unifying factor in a complex object, may well be a predictable movement, such as for instance ascent, descent, oscillation or rotation.

Another important development that has taken place after Schaeffer is the development of 'l'Acousmographie' at INA/GRM. This is a computer program that facilitates the synchronisation of visual signs and sounds. Analytical signs are freely designed and drawn using digital drawing tools; the only rule to be followed is that similar sound-events be represented with similar signs. What the analyst uncovers are in fact, very often, integral sound-characters (e.g. the split glissando in F. Bayle's *Rosace I* (2006; Bayle and Thomas 2008: 82)). Depending on the talent of the analyst as a visual artist, colours and shapes may further indicate subtle semantic elements perceived in the musical discourse; the analyses become art-work commentaries which are both aesthetically pleasing and pedagogically useful. But while the acousmograph presents the integral sound-characters as real time musical syntagms, paradigmatic comparisons are also needed to discuss the piece in full to make an analysis with musicological relevance. The development of concepts and theories around the analytical comprehension of music is indispensable in such a context; a good example of the combination of the acousmograph with analytical commentaries is provided by Marcus Erbe (2008). The analytical concepts we have proposed may well be used for commenting acousmograph analyses and might eventually also be integrated in the acousmograph program as an optional plug-in.

Stéphane Roy's book on the analysis of electro-acoustic music (Roy 2003) is an outstanding scholarly work of considerable weight; his work summarises a great number of proposals for approaches to the analysis of electroacoustic music. His approach to representing sound-events graphically is through free drawings of dynamic shapes, sonorous mass, and relative pitch that represent sound-qualities defined by Schaeffer's spectromorphological terminology. His ideas on implicative analysis are inspired by Leonard Meyer's theories on expectations (Roy 1998). A number of the functions he defines and to which he gives a graphic sign are the same as the ones that we have suggested (such as foreground, background, accent functions).

For a first transcription of the sound-events of the music, Roy proposes a set of hand-drawn shapes that represent some of the basic types of Schaeffer's typology. On this point one could suggest that the use of our spectromorphological signs would be an improvement, firstly because they are better standardised so as to represent a category rather than an

individual occurrence of a sound-event; secondly because not only the rough, but the finer parts of Schaeffer's sound-morphology may be notated whenever desired. Roy's graphic approach could also work well in combination with INA/GRM's Acousmograph, which also bases its approach on intuitive representations of the sound. Roy's original idea, the implicative analysis, seems like a handy tool that can be drawn on a spectrogram, for example. Roy's paradigmatic analysis addresses the question of sorting out the different integral sound-characters of the piece. It does not, however, spell out the difference between a general description of the character and its relative values of free play.

7. CONCLUSION

Schaeffer's idea that aspects of timbre should support and unify pertinent values forming gestalt-like foreground structures shows a number of deficiencies, since in sound-based music one may suppose that generally values are not pertinent, and that the character dominates over the values. Thus it seems that this feature cannot be transferred from interval-based music to sound-based music. Nevertheless, the character/value distinction is useful as a designation of features that enable the listener to identify a musical entity in a manifold, and to integrate a multitude of sound-events into greater wholes. As an improvement we propose the concept of the integral sound-character. This concept comprises the global perception of timbre and temporal behaviour, and refers to the recognisable elements in a musical composition. The analysis of integral sound-characters discerns unifying features, varying elements ('play'), and constraints. As a matter of fact, a number of analysts of sound-based music end up identifying the kind of elements that we have termed integral sound-characters, and some go on to describe them and list them paradigmatically. Since a number of concepts proposed by Roy, Smalley and MIM, as well as the pictographic representations of the Acousmograph, all to different degrees thematise important questions pertaining to the relation between the sound-objects and their organisation as sound-patterns, a further development through carefully negotiated syntheses of terms and methods is thinkable. Schaeffer's spectromorphology in its revised state and transferred to a graphic code, such as the one proposed by us, can offer a detailed and objective approach to the transcription of sound-based music – objective in the sense that, given a consensus to practise a reductive listening intention, it is possible to arrive at intersubjective agreements about a basic description and transcription of sound-objects and integral sound characters. Through the Sonova font, examples of the music may be entered in to a text-file for reference, closer

scrutiny, and analytical reflections. The spectromorphological description of the sound-objects allows for detailed insights into questions of the integration or non-integration between different sound-characters.

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