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AN INTRODUCTION TO HORACIO VAGGIONE'S MUSICAL-THEORETICAL THOUGHT

Makis Solomos

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Abstract. In the 1980s, Vaggione began coupling his compositional work with theorisation that can in many ways be described as conceptualising the issues at stake in recent music. This article attempts to summarise and comment on this conceptualisation by proposing an overview in five parts: 1) Interaction. Vaggione develops the idea of complexity as generalised interactivity. 2) Time. His reflection on time defines sound as a dissipative structure of energy and elaborates a multi-scale approach. 3) Morphology. This concept provides the means to bridge the gap between material and form. 4) Singularities. At the heart of Vaggionian thought lies his interest for the "saliences" and "details" which constitute morphological singularities. 5) Object Networks. Vaggione thinks of music as the interlocking of three levels (with variable degrees of temporal size), figures, objects (in the informatic sense of the term) and networks. In conclusion, this article addresses an essential question for Vaggione, that of the operative.

Keywords. Vaggione, recent compositional theory, interaction and networks, time scales, morphology, singularity

INTRODUCTION

Composer Horacio Vaggione doubles as a theoretician, as demonstrated by the abundance of his writings. Though his musical-theoretical thought evidently stems from ongoing interaction with his compositional work, it does however follow contours sufficiently abstract so that, from one moment to another, it achieves a high degree of generalisation. It can be grasped as a theorisation about the most important mutations in music of recent decades. Thus, it gives us a precise and elegant conceptualisation of the conjunction between instrumental and electronic composition, and even more precisely, between traditional composition and computer-assisted composition. In a more general way, it tackles the problem of conceptualising what is no doubt the most significant challenge of today's music: the bridging of the gap between "sound" and "structure", between material and form, or –to adopt Vaggionian terminology– between micro-time and macro-time. A systematic exposé of this thought can therefore be of interest not only to someone who wants to understand Vaggione's music, but also anyone tempted to analyse the evolution of recent music.

This text is based on articles published by Vaggione since the beginning of the 1980s. This period has been chosen for two reasons. First of all, the articles became abundant then, marking the start of day-to-day compositional *and* theoretical work –which, obviously, does not signify that, before this time, Vaggione was not interested in theory. Second of all, this period corresponds to a moment of historical importance. In order to find a way out of the crisis of the 60s and 70s, when music was torn between axiomatisation and intuitiveness, between hyper-rational and irrational tendencies, Vaggione opted, from this period on, to combine what he would call the "formal" and the "informal" (cf. Vaggione, 1982: 137), a choice which continues to characterize his approach (cf. M. Solomos, A. Soulez, H. Vaggione, 2003).

The musical-theoretical thought of Vaggione has three particularities, which, *a priori*, make its systematic presentation delicate. To begin with, it develops like a work-in-progress, calling for constant revision, during which are observed the birth and progressive disappearance of ideas and concepts. At some point, this article should perhaps be supplemented with a genetical type of analysis. Secondly, Vaggione's thought is characterised by its capacity to integrate multiple references into a complexly woven fabric, by proposing a "locus of intersection" (cf. Vaggione, 1996b: 269) for numerous disciplines, ranging from theorisation on instrumental music to computer music research, and from science to philosophy. In some ways, his ideas constitute a body of "layered concepts" that resemble his music, which he readily describes as a group of "layered forms" (Vaggione, 1995: 99). Thirdly, his thought is by nature radically non linear. Characterised by the very dense interactive weaving of the subjects it treats, any attempt to reduce it to simple issues becomes impossible. The reader should therefore be forewarned that the following exposé is only linear in appearance: the five principal subjects on which I have chosen to concentrate, criss-cross with one other according to a non-deductive logic. And if I begin with the concept of interaction, this is precisely because it clarifies the complexity that all non-linear thought creates. In this sense, the final subject, which addresses the concept of networks, brings us immediately back to this concept of interaction. The order of the other three subjects indicates when this presentation turns into interpretation: by proceeding from a reflection about time to the concept of singularity (via the concept of morphology), we are brought to the very heart of Vaggione's thought.

INTERACTION

Complexity and interaction

Vaggione's first article from the 1980s, begins with a critique of "the dominating Western way of listening to music", as a "linear homophonic discourse" which "always seeks to resolve, to transform antithesis into Unity" (Vaggione, 1980: 99). This critique, if taken out of context, could seem *a posteriori* like a post-modern *credo*, which proposes the dislocation of the work of art into a collage-like plurality. But, Vaggione did not take this route: he developed a kind of music and a form of thought that are *complex*, a way of operating that is plural, while maintaining the notion of the work as a clearly defined and articulated entity. Unlikely the composers of the British *New Complexity*, he refers to "theories of complexity" and defines the concept of "complexity" by quoting the physicist Lévy-Leblond: "Will be called 'complex', a system where mutual interactions between different levels are manifest" (*in* Vaggione, 1998b: 171)[1].

[1] In this article, Vaggione continues to quote from Lévy-Leblond's remarks on the "conditions" of complexity: when speaking about complexity (or about "intrication"), "it is necessary that a hierarchical structure ('levels') be distinguished, but one of which the articulation is not linear. […] In other words, it is the conjugation of both structural heterogeneity and functional reciprocity that appears to me to subtend the notion (of complexity), if it does have a definite content" (Lévy-Leblond *in* Vaggione 1998b: 171).

Interaction: this seems to be the keyword to understanding the concept of complexity that Vaggione subscribes to. This word possesses several meanings for him, which are outlined in the following quote dealing with the plurality of time-scales, a concept that we will return to later: "The emergence of an approach articulated around the idea of *generalized interaction* (being *internal to the musical work*) allows us to consider at the same time the existence of many possible doorways between previously unrelated time-dimensions and the nature of the *non-linearities* arising from their interaction. The problem for a composer interested in an extension of a given syntax to all available time-dimensions is one of finding the means to articulate such a complex situation". (Vaggione, 1995: 100, *nota bene*). Interaction is "internal to the musical work". As has been said, Vaggionian complexity is not synonymous with any post-modern plurality that tends to disrupt the notion of work of art. It is concerned with "non-linearities": this is why, by adopting this definition of complexity, Vaggione will for example abandon fractals. It is "generalised": the operative concept best adapted to describing Vaggione's music and thought is the network. We should add that this type of complexity is eminently anti-reductionist: we cannot "revert" to a cause, to simple principles or subjects, because, in generalised interaction, a linear causal chain does not exist. Finally, it would doubtless be interesting to consider this concept of interaction with regards to the concept of *mediation* (a term which Vaggione sometimes uses: cf. Vaggione, 2003a: 98-99), in particular as developed by Adorno: and in many respects, Vaggione's music seems like a response to the crisis of mediations running through 20th century music.

Interaction "direct actions"-algorithmic calculations

There are at least two areas in which the question of interaction takes on, for Vaggione, a more particular dimension. The first concerns use of the computer. During its protracted beginnings, computer-assisted composition was dominated by the ideal of automatic music – work by Hiller, Barbaud, Xenakis or König comes to mind. Due to the restrictions of linear programming, computer-assisted composition consisted of creating a "black box" (an algorithm) which, after the introduction of certain data, generated the work. If he did want to intervene, the composer could only do so on the output, by selecting or transforming the results supplied by calculations. Thus, with Vaggione, we notice that this first substantial stage of computer-assisted composition falls within the domain of "Turing's music" (Vaggione, 2003a: 97): it is characterised by the very slight and feeble interaction between compositional thought and (algorithmic) calculation. The alternative, he tells us, consists of envisaging "a plurality of diverse operations, rather than a single algorithm" (Vaggione, 2003a: 97). This alternative allows the composer to envisage *direct actions* (or "interventions" or *écritures*), as being in constant interaction with algorithmic calculations.

Direct (also called "manual") actions: explaining his work on phase decorrelation (in view of generating a spatialisation emerging from the morphology of a sound) with desynchronisations made by hand, Vaggione remarks that this possibility is "neither laborious nor so naïve as it might seem: to write music 'manually', note by note, partial by partial, or grain by grain, is an approach proper to a composer, and he should not be embarrassed about using this aspect of his craftsmanship" (Vaggione, 2003b: 24). It is clear that this "hand", is

not necessarily working without the extension of a computer's mouse. By calling for the hand and the concept of craftsmanship, Vaggione is in fact asking a question about *formalisation*: the interaction between direct composition and algorithmic calculation is synonymous with the interaction between formalisation and craftsmanship. "Science, regardless of its deductive or empirical nature, tends at least ideally towards an equivalence of process and result. Music shows no tendency of this kind, for the rigor of the generative process does not guarantee the music coherence of the work" (Vaggione, 1996b: 268), he notes at the beginning of a very dense text about formalisation in composition and musical analysis. This is not about reinstating the necessity for formalisation, but about designating its limits. Though it is true that formalisation can be "a powerful means of invention" (Vaggione, 1996b: 272), "the role that deduction plays in composition cannot be other than partial, 'regional', and cannot be generalised" (Vaggione, 1996b: 273). And, if for example, Vaggione chooses to call non-formalisation "craftsmanship" –rather than "intuition"– when referring to non-formalisation, it is because, on other "partial" levels of the composition process, the composer can "take good advantage of the (very subtle) lack of definition" of his problems (Vaggione, 1996b: 272). There is thus no opposition (or dialectic) between two antagonistic concepts, but rather a complementarity, which is mutually benefited by their interaction.

Interaction local-global

Relationships between the *local* and the *global* constitute the second domain where interaction as a concept is essential to Vaggione. This subject is in fact subjacent to the interaction between direct action and algorithmic calculation. Even if Vaggione restricts the latter, as we have just seen, to the "partial" levels of a compositional process, it always stems from a global approach –it is in fact the only definition that can be given of the notion of algorithm. Direct action, on the contrary, arises out of the local. The interaction between direct action and algorithmic calculation is thus thought of as an interaction between local and global: "a local action of *écriture* definitely has the possibility of being integrated into an algorithmic process, in the same way that, symmetrically, the product of an algorithmic process can be locally transformed by an action of direct musical *écriture*" (Vaggione, 1996c: 24).

However, this subject, to which Vaggione dedicates a chapter in his doctoral thesis (Vaggione, 1983), possesses a certain autonomy. If we once again refer to the crisis of mediations that atonal music went through, we could say that the subsidence of tonality led these mediations to favour sometimes the local (in the case of serialism) and sometimes the global (composition of masses or of textures) and to define the passage from one to the other in terms of "deduction". Vaggione's *propos* is to affirm that a mediation (an interaction) can be redefined between these two levels simply by giving them the same status: that of *composable* events.

TIME

Dissipative structures of sound energy

A group of questions dealing with time are brought up by Vaggione's texts. Among the most important, we begin by noticing that Vaggione, after composers like Xenakis and in parallel with the spectral composers, integrates the "modern" idea of time, considering it as irreversible. In this context, sound is no longer conceived in terms of periodicity or repetition, as defined by the "classical" acoustic model of Helmholtz, but as a dynamic, energetic phenomenon. One of his important references, in this domain, is the work by physicist Ilya Prigogine, the inventor of the "theory of dissipative structures". This is the theory to which Vaggione is referring when he describes "dissipative structures of sound energy" (Vaggione, 2003a: 102).

Micro-time and granularity

Secondly, Vaggione is interested in delving into the infinitesimal, into what has often been presented as the "inner life" of sound, a crucial question for a long line of composers starting no doubt with Varèse and continuing through Stockhausen to the current vogue of "microsounds". However, with relation to that issue, Vaggione differs in at least three ways. To begin with, he does not subscribe to the concept of "inner life" and its corollaries ("immersion", "auscultation" or even "delving into the infinitesimal"), which tend to be associated with space. For him, it is a question of *time*, and this is why he prefers to speak about a "descent" into *micro-time*. Further, beyond his fascination for phenomena occurring at this particular temporal scale, for him, the crucial question is that of *articulation*, of how to *compose* these phenomena. The title of an article from 1996 sums up these two aspects: "Articulating Micro-Time". In addition, whereas, in the problematic of the "inner life", fascination is frequently shown for a supposedly original matrix, a Unity –giving rise to the mystical leanings of composers like Scelsi, Stockhausen, Harvey, or even Grisey–, Vaggione sees this, on the contrary, as an opportunity to discover *pluralism*: "Descending into micro-time is for a musician, the means of discovering phenomena he is unaware of when he satisfies himself with the agitation of sound surfaces without taking into account their substrates. […] As Bachelard said: 'our intuition of time is still quite poor, limited to our intuitions of absolute beginning and continuous duration'. We have to therefore 'find the pluralism beneath identity', and 'to break down the identity far beyond an immediate experience summarised too soon as an aspect of the whole'" (Vaggione, 1998c).

This explains Vaggione's interest for granular synthesis: a technique based on a particular conception of sound which overturned numerous certainties. It corresponds to a corpuscular description of sound in opposition to its description as a waveform. Synthesising a sound in this way consists of juxtaposing samples in the domain of micro-time, by playing on their global density and on their morphological variations. It really is about finding "pluralism" (grains) beneath "identity" (the resulting sound). In addition, Vaggione stresses that a corpuscular description, unlike the oscillatory type, refers to irreversible time. The

granular approach "enables us to work with complex morphologies in a space-time where irreversibility reigns: 'dissipative' structures that emerge within a directional space-time, rather than in symmetrical, smooth continuities" (Vaggione, 2005: 341). This is why, in Vaggione's music, the granular approach is much more than a technique of synthesis. Not only does it permit him to articulate micro-time (synthesis), but he also applies it to macro-time (instrumental music). Moreover, he likes using the general concept of "granulation" and enjoys tracing it back to Lavoisier (cf. Vaggione, 1996a: 34).

A multi-scale approach to time

Thirdly, some of Vaggione's texts, from the second part of the 1980s until the close of the 1990s, elaborate the idea of a *multi-scale* approach to time. The idea is not new in itself – for example, Xenakis and Grisey had already brought it up– but its developments are. Vaggione begins with the pragmatic observation that there exists, as much within both musical tradition and human perception, a threshold from which we can delimit two orders of scales, corresponding to the domains of micro- and macro-time. In musical tradition, it is the "note" that instrumental music considers as the elementary unit: macro-time "encompasses all possible scales" above, and micro-time, all those below (Vaggione, 1998b: 172). The repercussions of this apparently innocuous formulation are enormous: they allow the break between instrumental and electroacoustic music to be reformulated and in doing so, tempered. In fact, seen from this angle, the gap between the two does not dwell in a difference of "nature" (of material, for example): it lies in a change of (temporal) scale. This way of thinking was made possible by the arrival of digital electronics, which permit micro-time to be composed. We can then view either side of the threshold, micro- and macro-time, as falling beneath the common emblem of the composable, of what can be articulated –without *abolishing* the threshold as there is a change of scale. In terms of human perception, the threshold is situated, as we know, between 50 and 100 milliseconds. Defined with the help of the granular model, this threshold signifies that, with less than ten to twenty sounds per second, the ear perceives grains as entities; when there are more, it perceives them as belonging to a global texture. By applying this model, as much to synthesis as to the instrumental they can therefore be unified, without however abolishing the difference between them. In the case of synthesis, we perceive the granular nature of the resulting sound, but it is indeed "a" sound. With the instrumental, on the contrary, even when the threshold of micro-time is close to being attained –as is often the case in Vaggione's scores, where musicians are asked to play demisemiquavers to a crotchet value of 100 MM–, we remain within the framework of a segregative flux. This is why granulation must not be taken literally when it is applied to instruments: Vaggione is not looking for an "instrumental granular synthesis" (cf. Vaggione, 2005).

I insist on the fact that the Vaggionian approach, which establishes the difference between the microscopic and the macroscopic in terms of time scales, does not set out to abolish the threshold that holds them together. This means that, even if these two levels can be unified, their disparities are however maintained. We cannot move from one level to another only by transposition. In Vaggionian terminology, a *non-linearity* exists between time

levels, an irreducibility from one to another. This is perhaps where the originality of his theorisation lies, because many musicians who also addressed this question, prior or parallel to him, were rather inclined to follow the principle of transposition. This is the case of Xenakis writing pieces conceived for the GENDYN programme, where everything is automatically deduced from a wave form; and equally applies to Grisey who was able to use the same waveform outline in several time scales (*Vortex temporum*). We could also refer to certain uses of fractals in music[2].

For Vaggione, non-linearities between time scales not only exist, but can also be productive to musicians: "To recognise the reality of [the] mismatches [between the different time levels] does not drive us to paralysis; on the contrary, it gives us the possibility to explore the passages between different dimensions, allowing us to articulate them inside a syntactic network covering the whole spectrum of composable relationships" (in O. Budón, 2000: 15).

MORPHOLOGY

The morphological approach

Unifying the electronic and the instrumental (while keeping their non-linearities in mind), also means unifying material and form. Both material and form are composable and can be articulated. From a Vaggionian perspective, there is no difference of nature or ontology between the two terms of this duality, but a difference of (time) scale. This is why the duality could be put aside: one could then use a single word rather than two words, one word declinable according to the scale. This is the role that the concept of *morphology* seems to play in Vaggione's texts. According to Vaggione, all time scales exploit morphologies: a sample (of granular synthesis), a waveform, a figure composed of a few grains (or a few notes) and the global form (macro-form) of a musical work can all be understood as "forms" which evolve in a (scale of) time pertaining specifically to them.

His use of the concept of morphology refers to two sources that he acknowledges. First, he refers frequently to René Thom, whose work –parallel to that of others– has led science to "rediscover" the fact that "our world is not reducible to a simple assemblage of microscopic material particles interacting one upon the other, but is made up of a multitude of objects, each possessing a singular form that itself obeys its own rules"(A. Boutot, 1993: 10). Next, there is the electroacoustic tradition which, in its musical praxis and its theorisations (Schaeffer, Bayle, Smalley, etc) developed –extending the intuitions of Varèse– a

[2] It would seem that this was not always the case for Vaggione. No doubt, he initially went through a stage where autosimilarity interested him (cf. Vaggione, 1989). "My last works like *Tahil* (1992), *Kitab* (1993) or like S*chall* (1994) and *Rechant* (1995) explore the dynamics of interaction, convolution, aliasing, and movement between laminar and turbulent sonic states, *out of which are born figures which do not function in the same way in different time scales*", he remarks in a revised version of the article from 1989. While reading this article, Vaggione said to me that he had already been interested in non-linearities in the mid 1980's, with works like *Thema* (1985), *Ash* (1989-90) or *Till* (1991). We could hypothesise that it was in becoming aware of the non-linear effects of the transposition of timbres that he arrived at this point of view (cf. Vaggione, 2003a: 106). From this moment on, non-linearity, as a generator of singularities, became a central concern.

"qualitative" treatment of sound in opposition to the "quantitative" treatment of serialism (cf. Vaggione, 1996a and Vaggione, 1999).

Besides the fact that it manages to unify the sound field (by going beyond the distinction material/form), the morphological approach has three things to offer. To begin with, it postulates that material (sound) is not neutral. In other words, its basic tenet is that minimum units ("blocks") do not exist to be assembled at will into some combinatory play that produces abstract "forms" –that is to say totally autonomous in relation to the material (cf. Vaggione, 1999: 237). This leads to an approach different from the parametric one. If a sonic form must be analysed (the morphological approach is not necessarily holistic), we will speak of its "characteristics", "aspects" or "components", and not of its "parameters". However, Vaggione does not object to parametric treatment. He postulates that the two approaches are complementary (cf. O. Budón, 2000: 13). Lastly, the morphological approach allows sonic forms to be thought of as dynamic movements, as processes. In Vaggionian terminology, this approach is "transformational", which implies that evolutions of characteristics or parts of a sonic morphology are envisaged with regards to their context (cf. Vaggione, 1996c). We know that processual thought is able to "orient" the musical discourse, to "vectorise" it, in Vaggione's language (cf. Vaggione, 1989 or Vaggione, 1996c: 26). It can also provide solutions to the problem of "mixity": bridges can be built between the instrumental and the electroacoustic worlds "by constructing the two sources out of the same musical situation" or else by using a "common vectorisation" (Vaggione, 1987)[3].

The example of space

Let us briefly examine the treatment of space, as an example of the morphological approach. Like numerous other composers, Vaggione postulates that space is composable (cf. Vaggione, 1998a). However, unlike musicians coming from the serial tradition, he does not view it as a parameter. Space *is part of* the morphology of sound, and, if it does have relative autonomy, this is as a morphology "which will modulate and be itself modulated by other morphologies" (Vaggione, 1998a: 154). This double status of space is the reason why Vaggione, in treating it, does not use standard techniques (reverb, panning, etc). These techniques have no relationship to the morphology inherent to a sound they are "spatialising"; they are simply added on to it and, in consequence, finish by levelling any singularity proper to it (Vaggione, 2003b: 26). This explains Vaggione's use of micro-temporal decorrelation techniques derived from signal engineering (cf. Vaggione, 2003b). In his use of them, they consist for example, in generating replicas of a waveform and proceed to desynchronize their phase relationships, within a micro-temporal scale, which creates a sensation of space intimately linked to the morphology of sound.

[3] Vaggione prefers to speak of the "transformational approach" rather than of "process" and uses the latter word in a more general sense. He no doubt meant to separate himself from spectral composers who have amply used this term (however, we find it in the sense used by spectral composers in: Vaggione, 1983, second part, chapter 5; Vaggione, 1998b: 195-196). We note also that the word "vectorisation" is used by T. Murail (1989: 157).

SINGULARITIES

Morphology and singularities

The morphological approach is also capable of emphasising a concept that is paramount to Vaggione, one often referred to in this article: *singularity (–ies)*. Once again Vaggione's reading of Thom was beneficial[4]: "The first obligation of any morphological interpretation consists in determining the discontinuities of a morphology and the stable parts of these discontinuities. In this interpretation appears the notion of singularity, of which, in fact, discontinuity is a particular case", writes Thom (1983: 91), in almost Vaggionian language. What is interesting about the concept of "morphology" in music is, as we have seen, the way it connects traditional concepts of "material" and "form". The idea of "morphological singularities" clarifies this connection: it challenges both the neutrality of the material and the universality of the forms. By morphological singularity, we mean that, as material evolves in time, at one moment or another "outstanding" characteristics are produced. This explains the use of the word "salience" as a synonym for "singularity": "It is the study of a morphological salience (the 'brilliance' of brassy sounds and how it is perceived in terms of temporal evolution), which led Risset […] to establish a model for the dynamic character" of sound, writes Vaggione (2003a: 92). Sometimes, he uses the word "detail" as a synonym. "The 'saliencies' are local qualities (forms) which emerge within the tension of the composed present and which allow a detailed morphological analysis, having them rebound as morphophoric, by creating classes which embrace and propagate their specificity: i.e. morphological details, which can be brought out and projected here and there into other regions, in the interplay of the work's vectors" (Vaggione, 2003a: 107).

The concept of singularity was already a central element in Vaggione's doctoral thesis. But, at that time, he tended to identify it with isolated sounds (cf. Vaggione, 1983: 2-3), to what one could call "monads" or (if we think of Cage) "singular" (in the sense of unusual) sonic actions. Subsequently, he was to consider singularities as assembled, sustained, tightly organised, framed by (or within) something. For them to stand out, they need to be inserted into a context which, without being neutral, is not just a sum of singularities, but also includes less salient elements. The problem can be presented in another way: a "direct action" can possibly *bring* a singularity *forward*, which implies that it also contains less singular elements. If the singularity consists of a "catastrophe" (Thom), it can only be measured with regard to the continuum that it fractures.

Figural work and the "informal"

The "framework" in which singularities spring out is called a *figure* by Vaggione, a concept which seems to become increasingly important to him. The concept of figure as he uses it, is firstly to be understood in its traditionally accepted musical sense: a group of several notes (with their combined pitches, rhythms, dynamics and playing modes) that form

[4] Note that other composers were also inspired by Thom (notably by his concept of "morphogenesis"): Hugues Dufourt, François Bayle, Aurèle Stroë, etc.

an entity. Starting with *Thema*, it is with this sort of figures that Vaggione defines (electroacoustic-instrumental) "mixity". For each work, he begins first by composing figures intended for the instruments (cf. Vaggione, 2005). He then records and analyses them to put their morphological singularities intro relief. Finally, he composes, both the electroacoustic and instrumental parts, by fashioning transformations of these figures, transformations which amplify and/or project their morphological saliencies into other regions. He calls this compositional technique "*écriture* [writing in the sense of composing]-processing", a technique that acts like a "prism" (cf. Vaggione, 2003a: 104). Another definition of the word "figure" is put forward by the fact that this concept can be applied to any time scale. Vaggione remarks that the morphological transformations he puts into practise, "generalise a 'figural' work which can be projected into the most diverse temporal scales" (Vaggione, 1998c). It would seem that this generalisation is especially applicable to micro-time, in which the granulation of a sampled sound can be thought of as figural work (cf. Vaggione, 1989), or in which Vaggione produces "composed spatial figurations" (Vaggione, 2003b: 27), thanks to the technique of micro-temporal desynchronisation.

The use of the word "figure" refers, in one way or another, to the problematic of "thematicism" (thematic thought). The music of Vaggione is of course, not thematic, but deliberately positions itself with regards to the question of thematicism via a significant reference: Schoenberg's period of free atonality as commented on by Adorno in "Vers une musique informelle" (1961). Vaggione thus relates his figural work to the *positive* surpassing of thematicism that Adorno spoke of with regards to *Erwartung*: "The expression is taken from Adorno. It retains, it seems to me, a content that is relevant for us today: after having accomplished a profound questioning of traditional thematicism during the 20th century, we can now envision new perspectives to develop with regards to the issues raised time and again by the need to articulate the material" (Vaggione, 1998c). This reference to Adorno –which also seems to have stimulated other contemporary composers such as Ferneyhough– is important, because it allows us to understand that the Vaggionian criticism of algorithmic composition, as well as his concern for "direct action", in no way veers toward (as Cage might have) a criticism of rationality. To characterise Vaggione's music and philosophy, we could almost repeat word for word the following passage from "Vers une musique informelle": "Only music that is fully mastered can itself be free from all constraint, including its own. […] The task of informal music would be to positively surpass those now counterfeit aspects of rationality. Only a completely articulated work of art provides the image of a non mutilated reality, and at the same time, of liberty" (Adorno, 1961: 538).

OBJECT NETWORKS

Objects and networks

A figure "can be coupled with the concept of object, the latter being a category that allows figures to be included and circulated through a network of compositional operations" (Vaggione, 1998c: 98-99). In one sense, Vaggione's compositions consist in making

singularities productive through the construction of three-tiered musical edifices: figures, which we have just discussed, *objects* and *networks*. It should be clarified however, that these tiers do not designate orders of a determined (temporal) size, because they can change scale.

The Vaggionian "object" concept is borrowed from informatics: it refers to object-oriented languages that were first developed in the 1980s, and propose an alternative to linear programming. In his music, as in his musical-theoretical thought, Vaggione radically appropriates the informatic concept of the object: his first article on the subject is entitled "A Note on Object-based *Composition*" (Vaggione, 1991; *nota bene*). Objects can be "functions (algorithms), lists of parameters (scores), scripts (chains of actions to be undertaken) or sounds (products as well as sources)" (Vaggione, 1998b: 187).

Independently from the reference to informatics, Vaggione's use of the object concept is not insignificant. We know that, in the field of electroacoustics, it refers to the tradition of *musique concrète* as conceptualised by Schaeffer. But Vaggione's approach is quite different for two reasons: Schaefferian "sound objects" are only located in the domain of macro-time, while Vaggionian objects can be found in any time scale; furthermore, the first are "opaque" since they are produced on a magnetic-analogue tape, whereas the second, being digital, are always composable (cf. Vaggione, 1998b: 188-192). Moreover, Vaggione is careful to distinguish between his concept of the object and the one prevailing in the philosophical opposition between subject and object (cf. O. Budón, 2000: 13-14).

Among the consequences of using this concept in composition, Vaggione remarks that it enables both the sound and the "score" (in the sense given above) to be "encapsulated" (Vaggione, 1991: 212-213). In musical terms, nothing prevents us from understanding "score", as structure (or a as syntax). So, thanks to the concept of the object, Vaggione manages to bridge the gap between the traditional duality of sound and structure –just as the concept of morphology enabled the schism between material and form to be attenuated. The notions of morphology and object allow the dualities in question to be overcome because, thanks to them, the concepts they contain can be considered in terms of composition, of articulation.

The notion of "network" is intimately bound to that of the object: "Any object is […] a network, just as any network is constituted of objects" (Vaggione, 1998b: 187). It can however be distinguished from the concept of object, if we consider a network as defining a level superior to the object. Thus, "the concept of the network applies to all types of relationships possible between object ensembles and subensembles (classes and subclasses)" (in O. Budón, 2000: 14). The notion of the network is also understood as the association of different types of representation in the manner of a hypertext (cf. Vaggione, 1998b: 189-190). It could be thought that to define a network, Vaggione would be referring to informatics. But he chooses to quote a book by Michel Serres from 1968, *Hermès 1. La communication*: the concept of network "refers to a situation where there are a 'plurality of points (peaks) linked by a plurality of ramifications (paths)', and in which 'no point is univocally subordinated to any other: each possesses its own strength […] its zone of radiance, or even its original determinant'. In addition, a network is always recomposable: 'it represents any state of a mobile situation'" (Vaggione, 2003a: 99). He adds, in a footnote, that he gives this "relatively dated and non-technical definition, first to show the constancy of the network concept, and

secondly because this definition has not been biased by more recent connotations which would tend to trivialize it" (Vaggione, 2003a: 114).

I have emphasised the fact that Vaggione appropriated the computer concept of the object, going as far as to speak of object-based *composition*. We could therefore suppose that it was object-oriented programming which led him to compose in this way. But this is not at all the case. In the article "A Note on Object-based Composition", he explains that he developed this approach in the 1980s, in a computer environment which was not object-based (cf. Vaggione, 1991: 209-210). We could therefore say that Vaggione intuited the concept of the object before having studied object-based programming. This explains why the conceptualisation was done *a posteriori*, and also applies to the "network" concept. We could hypothesise that even works anterior to the 1980s were already implicitly working with this concept. In a sense, at the end of the 1980s, this word took the place of another word, by which any musician would want to qualify the music of Vaggione: *polyphony*. We can infer that Vaggione replaced the word polyphony (treated in his doctoral thesis completed in 1983, a text which does not use the word network) by the term network in order to dissociate his music from classical polyphony (which, as musicians say, is "linear"), and maintains it only when designating his use and his manner of overtaking of the latter (or replaces it by the term "stratification" when naming, for example, the assemblage of diverse layers which make up his mixed music: cf. Vaggione, 2005).

Operative categories

By pointing out that Vaggione's intuition precedes his conceptualisation, my intention is not so much to stress the antecedence of his compositional practise on his theorisation (that antecedence is obvious). My intention is also not to re-establish the duality intuition-conceptualisation, a duality that Vaggione's musical-theoretical thought tends to abolish. I merely want to suggest that Vaggione's concepts are not implementations of imported notions. These concepts, Vaggione tells us are *operative*: "the concept of composing with networks of objects is above all operative, its main purpose being to allow working at several simultaneous time scales, hence linking micro-time features, which are not always directly perceived, with 'surface' activity, where these features can clearly show their incidence on larger time scales" (in O. Budón, 2000: 13).

Operative: in conclusion, let us linger on this word, so well-suited to the Vaggionian *method*. In one sense, all of the categories with which Vaggione constructs the multi-layered conceptual whole, characterising his musical-theoretical thought, are operative in nature. The same applies to his manifold references to fields outside of music. Take for example one of his unpublished texts in which the mathematical concept of dimension is evoked. There he notes, that in music one could assimilate an isolated grain (point) to the dimension of 0, an isolated sinus wave to the dimension of 1 and a spectrum (plane) to the dimension of 2 – his intention being to envisage musical spaces with "fractional" dimensions, that is to say, the transitions between the musical states which have just been mentioned (Vaggione, 1989: 3-6). He adds: "[…] what I am trying to reach here is no more than purely operational criteria. […] It is not important that the spaces segmented here be 'real': they are useful because they offer

ways to grasp the idea of a music constructed from multiple time scales" (Vaggione, 1989: 6). Operative thought does therefore not *hypostasise* its categories (they are not referring to the "real"). In addition, the "usefulness" of which it is a question here, does not signify that one *makes use* of the mathematical concept of fractional dimension: operative thought should not be confused with pure "instrumentalism": "it is thought that determines both the operation and the object", Vaggione writes, referring to Granger (in M. Solomos, A. Soulez, H. Vaggione, 2003: 224). It is in this sense that all the "objects" of Vaggionian thought (his categories and concepts) are operative in origin. To take another example, in relation to the preceding: the notion of multiple time scales is operative because "the levels (time scales) involved in a musical process are simply not countable (and therefore not reducible to phenomena relating to linear taxonomy), but musically defined – this definition being considered already as belonging to what is to be composed. In other words, the time scales themselves are determined according to the "multi-scale" field that is postulated for each composition" (Vaggione, 1998b: 171-172)[5].

Translation by Jacqueline Rose and Jeffrey Grice

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[5] In this the Vaggionian notion of "micro-time" differs for example from the developments of Curtis Roads concerning "micro-sounds" (cf. C. Roads, 2002): for the latter, micro-time scales are hypostasised.

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