

Music, Musical Semiology, Musicology: Contribution of the Philosophy of Complexity and Musical Heuristics

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ABSTRACT

My contribution postulates the need to include Edgar Morin's principles of philosophy and complexity as additions to musical semiology and musicology so as to be able to tackle analyses basing oneself on a polysemic attitude that is most likely to convey all the riches of the musical phenomenon especially regarding its fluidity and dynamics. The first part of the article aims at approaching Jean-Jacques Nattiez's musical semiology as well as the analyses that stem from it. The second part attempts to make the notion of musical work intelligible as its systematic complexity is examined while the difference between the score and the work is defined. The re-structuring of a work that is made possible by musical heuristics gives way to an "embodied" approach of reference pieces thus giving Nattiez's analyses the follow-up that is necessary for them to come to fruition. The last part of my communication attempts a musicological implementation of the three underlying principles of the philosophy of complexity.

Keywords: Music, musicology, semiology, complexity, heuristics.

INTRODUCTION

This article aims at providing elements that will strengthen the link between two fields that intersect on the subject, fields such as music and musicology, but which reveal great differences as to the tools they require as well as to their methodology. With this aim in mind I shall venture into a critical analysis of the limitations of the rational approach when faced with music. This will lead me to suggest fresh outlooks on "the musical" that will complete the analyses that stem from semiology, basing myself on the philosophy of complexity, on the one hand, and on musical heuristics (Mandolini 2012)¹, on the other hand.

SEMIOLGY AND MUSICAL ANALYSES

Approach

Inspired by linguistics, the semiology of music that Jean-Jacques Nattiez develops around Jean Molino's tripartite classification views the musical work from the perspective of its creation and the circumstances surrounding it

(poietic dimension), from its material medium (score, transcription, recording support: the neutral level) as well as from the way it is perceived and under what circumstances (esthetic dimension) (Nattiez, 1990)². Starting from this classification, Nattiez asserts that today's diverse musical analyses can use this diversity as an epistemological base that can make it easier for both the student and the musicologist to understand.

“The analysis of works, the analysis of forms, the analysis of styles: the suggestions made by Schoenberg, Reti, Ratz, Walker, Keller, Epstein, Meyer, Forte's set-theory, Schenkerian, neo-Schenkerian and post-Schenkerian analyses; sociology, anthropology; psychology, and soon neuro-psychology of music. [...] If one is aware that the multiplication of theories and lines of enquiry coincides with a period in the history of culture in which, as far as teaching is concerned, the clarity of the philosophical and epistemological concepts does not prevail, the least one can do is come up with a framework so as to classify the various groups of analyses. [...]”

¹MANDOLINI (Ricardo), 2012, *Heuristique musicale – contributions pour une nouvelle discipline musicologique, (Musical heuristics, contributions for a new musicological discipline)* éditions Delatour France.

²NATTIEZ (Jean-Jacques), 1990, *Music and Discourse – Towards a Semiology of Music*, translated by Carolyn Abbate, Princeton University Press, p. 10 – 16.

(Nattiez, 1990)³

Molino's classification makes it possible to set up a typology made up of five different analytical situations:

Inductive Poietics (From the Neutral Level to Poiesis)

One of the most frequent situations in musical analysis is an attempt to uncover certain aspects of poietics starting from the Neutral Level.

“We witness so many recurrent methods in a work or a series of works that we find it difficult to believe «the composer was not aware of it”⁴.

For instance, the leitmotifs in Wagner's operas, that Wagner may not have immediately thought of, have been identified by Hans von Wolzogen in his *Thematic Guides* (von Wolzogen, 1878)⁵

External Poietics (From Poiesis to the Neural Level)

Relying on documents, letters, rough sketches made by the composer, the analysis attempts to decipher the work.

Example: the analysis of some of the passages in Beethoven's *Ninth Symphony*, op. 125, through various sketches catalogued by Giovanni Biamonti in 1968.⁶

Analysis of the Neutral Level or Immanent Analysis

In this situation, neither the circumstances of creation nor the circumstances of reception of the work are taken into account. It amounts to no more than a description of the structural configurations that can be found in the score as, for example, Boulez's analysis of the tempo of Igor Stravinski's *The Rite of Spring* (Boulez, 1966)⁷ or that of Bela Bartok's *Music for Strings, Percussion and Celesta* made by Jürgen Hukemöller (Hinkenmöller, 1982)⁸.

³NATTIEZ (Jean-Jacques), “La semiologie dix ans après” (“Semiology Ten Years Later”), 1986, *Musical Analysis Journal Chosen Reprints* 1985 – 1993, p. 30.

⁴*Ibid.*, p. 31.

⁵VON WOLZOGEN (Hans), *Guide through the Music of R. Wagner's «The Ring of the Nibelung»*, 1878, translated into English by Ernst von Wolzogen, Leipzig, Publisher Feodor Reinboth, ,

⁶See BIAMONTI on-line catalogue in <http://www.lvbeethoven.com/Works/Biamonti02.html>

⁷BOULEZ (Pierre), “Stravinsky demeure” (“Stravinsky lives on”), 1966, in *An Apprentice's Notes*, Paris, Seuil publisher, p.75-145

⁸HUNKENMÖLLER (Jürgen), 1982, *Béla Bartok – Musik für Saiteninstrumente, Schlagzeug und Celesta (Music for*

Inductive Aesthesis (From the Neutral Level to the Aesthetic Dimension)

In an attempt to establish the perceptive relevance of music, the musicologist determines, on the basis of the interpretation of the Neutral Level, *what one really hears*. It is the case in this example which is an interpretation of the beginning of Section 4 (28 to 32) of Gérard Grisey's *Partiels*.

“In opposition to the melodic and soothing character of the previous section, the fourth section begins with a loud clang of Tam. The echoes of the strings and the trills of the winds give life to the movement. The irregular vibratos on the breathing associated with the beatings of a metal baton behind the Tam emphasize the unstable and dramatic nature of the sequence. ” (Alla, 2007)⁹.

Stéphane Roy bases himself on this type of analyses to launch into an analysis of Francis Dhaumont's electroacoustical piece *Points de fuite* (Roy, 2003)¹⁰.

External Aesthesis (From the Aesthetic Dimension to the Neutral Level)

Based on the opinion of the listeners, the analysis compares what is written and what is felt about the score. At times, there are huge differences. A good example is given in Section C, bars 25 to 30, of György Ligeti's *Atmospheres*. If you rely on the score, the *divisi* of strings do an *accelerando* whereas the flutes and the clarinets do a superimposed *rallentando*. When you hear it for the first time, this passage sounds like a great big noise that spreads throughout the whole register.

“[...] One may start from information gathered from the listeners to try to know how the work has been perceived. It is quite obvious this is how experimental psychologists will work” (Nattiez, 1986)¹¹.

Strings, Percussion and Celesta), Munich, Wilhelm Fink publisher.

⁹ALLA (Thierry), 2007, revue en ligne d'Education Musicale en Aquitania, Académie de Bordeaux (on-line journal of Musical Education in Aquitania, Bordeaux Education Authority), in <http://webetab.acbordeaux.fr/Pedagogie/Musique/grisey.html>

¹⁰ROY (Stéphane), 2003, *L'analyse des musiques électroacoustiques : modèles et propositions (Analysis of Electroacoustic Musics : Models and Proposals)*, L'Harmattan publisher.

¹¹NATTIEZ (Jean-Jacques), “Semiology, Ten Years Later”, *art. cit.*, p. 31.

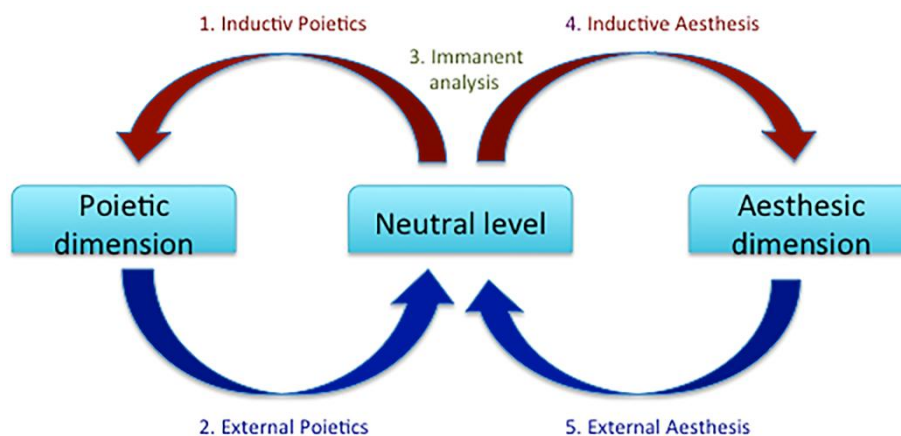


Fig1. Five analytical procedures

Apart from the analyses that have already been mentioned, the whole of Molino's tripartite classification can be added as a global analysis situation. It would be the case for Heinrich Schenker's generative theory.

The Score, the Bulwark of Objectivity

The criticisms concerning Molino's tripartite classification as well as the analyses Nattiez draws from it could begin with this remark:

“Whether they be conceived by Schenker, Ruwet, Nattiez etc., all the systems that have been developed in the last decades have at least one common base: the score (the fetishism of the score). Semiotologists have indeed come up with the bright idea of «tripartition», but one has to admit that, up to now, with the exception of the neutral level, the other members of this trinity have been largely neglected. Thus, we have not departed from what is thought to be evident, namely that the analysis rests solely on the score. This point may well seem innocent, indeed it is, if you believe that the results of the analysis are merely focused on the score itself (and are only of interest to the analysts). It is no longer the case if, as usually happens, one aims at drawing conclusions from the analyses on the musical level (analyses that are likely to be of interest to musicians also)” (Lajoine, 1986)¹².

Indeed, the analytical procedures that have already been described always hark back to the score as the sole fountainhead of objective information. As a consequence, there seems to be a control of the score over the work, which is why it is necessary to scrupulously set the two words apart. The score is about the necessary

instructions needed for the interpretation; it is a framework from which the work becomes a phenomenon and updates itself. Based on this framework, the work acts as a never-ending future; it is always updated by the various versions one can listen to. Confusing the score with the work lessens the importance of the various versions that, due to the changes and the imponderables peculiar to interpretation, are, after all is said and done, what the public will know of the work and what will make critical judgment possible. If the score and the work were one and the same, there would be no need for various interpretations. Furthermore :

“The musical work is characterized by dynamic and rhythmic properties which, if this is applied to the score, does not make any sense. (...) the score is distinct from the musical work. It is not a stratum of that work, it remains out of it. That is why the score does not come into consideration when it comes to grasping the musical work that we perceive when we listen to one of its interpretations without knowing the score at all or without having to know anything about it. This best shows that the musical work is completely different from the score. Even when we do use a score to get to know the work, when it comes to interpreting it, the score remains, as opposed to the work itself, an external entity that is subordinate to the work.” (Ingarden, 1989)¹³

When the score is an addition of superimposed parameters, in the musical actuation of the work, these parameters reflect on one another and generate transformational correlations. Let's take the most simple of example:

¹²LAJOINE (Vincent), 1986, “Impasses”(“Dead Ends”), in *Revue d'Analyse Musicale Les réimpressions choisies 1985 – 1993*, p. 8.

¹³INGARDEN (Roman), 1989 for the French version, *What is a Musical Work?* Translated from German to French by Dujka Smoje, Christian Bourgeois publisher, p.69.



Fig2. Note held

In acoustic reality, the note finds itself in a never-ending dynamic process, given that the components of the spectrum of the C reflect on one another. We thus listen to an evolving process whose different spectral qualities the ear continually discovers. This is due to the dynamic evolution of each part as well as to the interrelation of these evolutions and to the resonance of other strings of the harp of the piano; it is also due to the structure of the sound box of the instrument. All of this makes for a surprising, indivisible and complex whole. What is indicated on the score as a long, bound and static note is, in fact, *a system*, “an interrelation of elements constituting an entity or a global unit” (Morin, 1992)¹⁴.

MUSICAL SEMIOLOGY WHEN CONFRONTED WITH COMPLEXITY

The Musical Work is More than the Score

As shown in the example we have just seen, it is important we should notice that the musical parameters indicated on the score generate a series of emerging phenomena that did not exist before the work was played. These phenomena are a wealth of transformational items that go beyond the parametric additions the score relies on. Thus we come to a holistic conclusion which is characteristic of the philosophy of complexity: in the field of music, the whole is more than the sum of all the parts that make it up. For example, to see a simple rhythmic sequence on paper does not inform us of the succession of events. When we play it, all the parameters of the music lie there (height, articulations, dynamics, accentuations etc.) under the phenomenalisation of what the score indicates as mere tempo.

“Emergence is a new quality in respect to the components of the system. It has, therefore, the force of event. since it surges up discontinuous once the system has been constituted; it has of course the character of *irreducibility*: it does not allow itself to be decomposed and one cannot

deduce it from anterior elements. We have just said that emergence is irreducible – phenomenally—and undeducible logically. What do we mean by this? First of all, that emergence imposes itself *as fact*, a phenomenal given which understanding must first of all recognize. The new properties which arise at the level of the cell are not deducible from the molecules considered in themselves. Even when we can predict emergence based on knowledge of the conditions of its rise, it constitutes a logical jump and opens in our understanding the breach through which the irreducibility of the real penetrates.” (Morin, 1992)¹⁵

The musical phenomenon is thus unitary and cannot be divided into parts, a fundamental datum that writing does not take into account. The imponderables risen from the interrelations between the parameters define interpretation. From all these systematic, countless and unique dynamics which happen among the parameters, musical art is born.

“Let us suppose we are in possession of an exhaustive theory that could explain all the phenomena concerning tempo and of another theory that would perfectly account for melodic phenomena and of a third theory on harmony. Let us imagine that we apply these hypothetical theories to the second movement of Beethoven's Seventh Symphony. First, we are faced with a rudimentary tempo, an unsophisticated melody and a basic harmony. In order to try to understand how on earth the combination of such ordinary elements [...] turns into such an amazing music [...], we would need a correlational theory whose objective would be to explain the complexity of relations, not only between tempo, melody and harmony but also between all the factors involved in music”. (Sadaï, 1985)¹⁶.

The Musical Work is Less than the Score

In the same way as emergences result from the transformational interaction between various

¹⁴MORIN (Edgar), 1992, *Method, Towards a Study of Humankind*, Volume 1, “The Nature of Nature” Peter Lang Publishing, translated and Introduced by J.L. Roland Bélanger, New York, p. 98. on line in https://monoskop.org/images/a/ad/Morin_Edgar_Method_vol_1_The_Nature_of_Nature.pdf

¹⁵MORIN (Edgar), *Method, Towards a Study of Humankind*, *op.cit.*, p. 106

¹⁶SADAÏ (Yizhak), 1985, “Analyse musicale: pour l’œil ou pour l’oreille?” (“Musical analysis: for the eye or for the ear?”), in *Revue d’Analyse Musicale Les réimpressions choisies 1985 – 1993*, p. 15 –17.

musical parameters, the work dictates several restrictive imponderables relating to the execution of each instrument on its own. For example, the vibrato of the solo violin is unlike the vibrato of a violin that has been incorporated into a series of violins in the orchestra, in which quite a few tempered instruments (piano, harp, celesta, vibraphone, guitar, etc.) necessarily have to chime in with non-tempered instruments whose intonation is sensitive (strings) -which means that music can erase the individual elements that may alter its globality. This is how our perception works: individual saliences are literally engulfed by the action of reception of the form. These are the thresholds of our perception which enable us to have an understanding of all the parameters involved in music that is rational and not sporadic.

“The whole is less than the sum of the parts : this means that qualities, properties attached to the parts considered isolatedly disappear inside the system. Such an idea is rarely recognized. Yet, it is deducible from the idea of organization, and lets itself be conceived much more logically than emergence. [...] The internal determinism, the roles, the regularities, the subordination of components to the whole, the adjustment of the complementarities, the specializations, the retroaction of the whole, the stability of the whole, and, in living systems, the mechanisms of regulation and control, the whole systemic order in a word, are translated into so many constraints.”(Morin, 1992)¹⁷

For example, an orchestral tutti in which all the voices involved are inscribed on the score, is perceived as a unitary phenomenon from which the individual characteristics of each instrument have disappeared. The whole is less than the parts.

Common Characteristics of Emergences and Constraints

Characteristics the work's emergences and constraints have in common Edgar Morin's philosophy of complexity, if applied to the musical work, enables us to detect the following marks between emergences and constraints. They are:

- A series of qualities/properties that cannot be deducted from the qualities/properties of the intervenient elements.
- They happen at the time when the work is performed.

- They are the inherent and in dissociable result of the work seen as a whole.
- They are an unpredictable novelty that arises from the known acoustic material.

The Musical Work is More, at the Same Time Less than the Score

This surprising assertion makes the principles of Aristotelian logic ineffective, which is why any conceptual/discursive interpretation of the work based on these principles will always be a lowering of its complexity.

If we refer to the theory of parametric correlations Sadaï demands (quote 15), couldn't it possibly lead us to the same causalities of logic we have just discarded? Obviously, what we need to grasp the very substance of music is *not a theory but a change in attitudes, in approach, in methodology*. If music is life and movement, one cannot be content to listen to it, one's mind needs to learn to move with it. To grasp the very core of music, one should not consider it to be a finished good as it fully exists only when it is performed. Instead of being a hermeneutic interpretation, the musical phenomenon stands out as a heuristic that must be developed, *a work in progress* that is likely to grow and change.

THE HEURISTIC ALTERNATIVE: RECONSTRUCTING A WORK AS AN EXTENSION OF ANALYSES

Reconstruction's Process

As a direct implementation of Aristotle's Mimesis, viewed as an interpretation and a creation based on a model, musical heuristic suggests the reconstruction of a work should be the extension of musical analyses. The process of reconstruction is a heuristic fiction that leads to a musical ad/or vocal or else electroacoustic experiment. It applies to pieces that cannot be deciphered whether harmonically or melodically. As they know the basics of graphic semiology, the listeners/musicians (musicologists, students, professional musicians) first make the transcription of the music they hear as it emerges from the many comparative hearings. The original score is not initially known. It is temporarily supplanted, on the neutral level, by the version you listen to, whether it be recorded or performed by musicians in real time.

With each hearing, the person who conducts the experiment (professor/musicologist) gives an explanation, thus completing the inductive esthetic analysis of the work. This gives a

¹⁷MORIN (Edgar), *Method, Towards a Study of Humankind, op.cit.*, p. 109-110

renewed profound meaning to the hearing as well as to the determination of its salient moments.

Articulation to the Analyses

Once the graphic transcription of the hearing has been done, those who have experienced the reconstruction will make a double entry table. In the column on the right they will write the actions they have spotted along with their symbols and the timing. In the column on the left, they will write the vocal/instrumental /electroacoustic actions suggested as an imitation of the former. The professor will make the experiment easier by suggesting various instrumental solutions relevant to the acoustic sources the group has access to. All the reconstruction proposals are on the table and can be adopted or rejected by the group. In that way, auditive transcription evolves into a new score which reflects the instrumental imitations that have been suggested. When the reconstruction process is over, the leader reveals the score of the work in question. The time has come for the attendants to carry out an immanent analysis as well as poetical analyses of the work. Comparing the auditive transcription and the original score is quite enlightening. From a musicological standpoint,

the heuristic fiction of reconstruction has been it possible to coordinate the esthetic level of the work with a new poietic, that of the people involved. That is how they feel the work becomes theirs and cannot be adulterated by analytical cuts since dynamic and perceptive continuity has been firmly established. From a musical standpoint, the people involved have produced a work that retains similarities with the reference piece but remains independent from the model.

To sum up: musical heuristics suggests an indispensable collaboration with the analyses of musicology, which allows for two parallel, complementary visions: one stems from the musical as an actual experience that has been processed and complemented; for the other, the musical is still an ongoing process. According to the traditional musical vision, it is possible to divorce the analysis from the feeling the work triggers in us. This mediation is the cradle of the closely related notions of reflection, observation and analysis. For musical heuristics, it is impossible to separate the study of the work from the feeling it triggers because study and feeling will mingle.

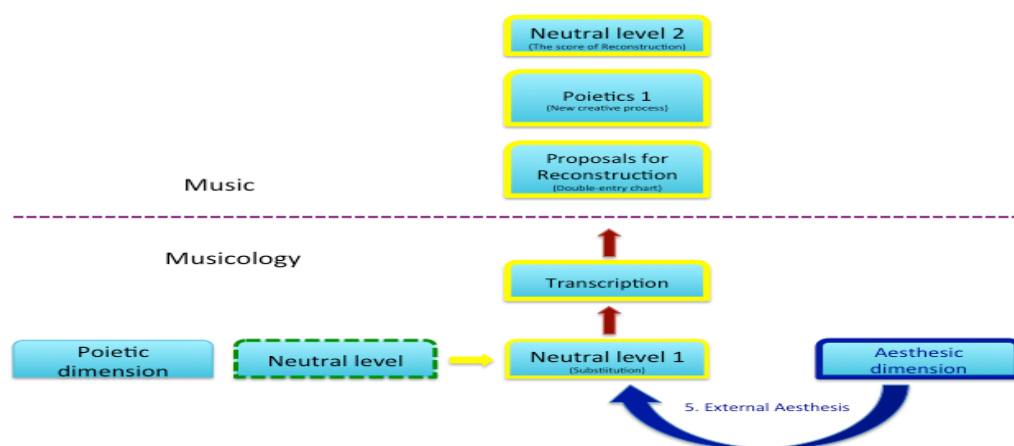


Fig3. Reconstructing a work, a heuristic plan

The heuristic plan above shows how the reconstruction of a work is carried out. First, we realize that the work is based on external esthetics as defined by Nattiez. The peculiarity of this reconstruction lies in the fact that the Neutral Level of the score is superseded by the recording of the work. References are merely audible and they are represented by a graphic transcription. Up to now, we have been in the field of musicology. The next step, that is the proposals of imitations of events suggested by the recording with the voices, instruments or electroacoustic material we have access to, moves the experiment of reconstruction into the

field of musical creation. We cannot fail to notice a strong dialectic process (represented by the blue arrows) between a) the making of the imitation board (which includes the proposals of imitations alongside the representations of events and the materials of the work that are perceived by the ear, b) the making of the score of the reconstruction and c) the creative process that stems from this reconstruction. The analyses Nattiez defines as Inductive poietics, External poietics, Analysis of the Neutral Level and Esthetic inductive analysis can join together at any time, whether in the musicological phase or in the phase of creation.

MUSIC, HEURISTICS AND COMPLEXITY

Convergences

Musical heuristics stems from the admission that music is not an isolated phenomenon that is born in space and time but the outcome of several interactions between various superimposed phenomena. a) The interaction that happens between the acoustic source, the space in which it expands, the place in which the performance takes place and the psycho-acoustics of the perception. b) The interaction between the composers, the performers, the transcribers, the conductors, the instrument makers, the sound technicians, the acoustic engineers, the public, the teachers, the students, as well as any other person, element, technical parameter or changing factor that may have something to do with the musical process. c) The interaction produced between the different historical periods and our time -for example, the period the performer of music of the Renaissance is confronted with, just as an example, which boils down to the question whether historical reconstruction is a constitutive concept or whether it simply remains out of the interpretation. d) The interaction between different sources that are geographically far apart -it is the case of the performance of a music that recombines a homogeneous space thanks to electroacoustic means, with performers who are in different places on earth. e) The interaction between reality and fiction, between demonstrable truth and plausibility. As has already been said, fiction can work in relation to music as a teleological horizon, or explicitly deny this organisation, granting another form of will without any temporal determinations to the compositional realisation. In both cases, from the original fiction there emerge real consequences that can be spotted during the process of realisation.

This extreme complexity of music cannot be simplified or explained resorting to terms of unitary causality. If music is treated as a unitary phenomenon, it turns into a metalinguistical object and it loses its true value as an event.

It has become indispensable to understand that this complexity is more than simply holistic, that is to say that the musical whole is always more, and always less than the sum of its elements. Thus the height, the rhythm, the dynamics, the tone, the character, the tempo, etc., are not isolable parameters that add up but their relations are interactions that merge to produce the music we hear. If we wish to preserve the fluid nature of music as an event, these parameters have to be presented taking into account the fact they are a whole. For the same reasons, learning music

theory should not be dissociated from the works, and this applies to all the theoretical musical subjects. Thus, harmony, counterpoint as well as fugue should always be taught, as is the case with instrumentation and orchestration, in relation with an example of living music and not on the base of theoretical models.

Edgar Morin's Reliance

The complexity of music viewed as the result of multiple interactions can be interpreted using the terms of Edgar Morin's philosophy of reliance¹⁸, basing oneself on his three main principles: dialogics, retraction/recursion and the hologrammatical principle.

Dialogics

It is possible to retain a plurality of opposed terms. Within a whole, two terms or more can be both complementary and antagonistic. So, there is some kind of underlying dialogics between different elements when they are opposed and we need all of them to describe a situation or solve a specific problem. These principles can remain contradictory and fuel their controversy. There is no need for them to achieve a synthesis. This is particularly relevant for music in which diverse contradictory forces act as a dynamic source, giving birth to actions and behaviours that will become part of the work. The notion of dialogics, when applied to music, thus refers to the forces that keep on fighting without reaching a synthesis. So, the work of art can be explained as conflicting categories that find a moment of harmony in their never-ending conflict. As for the teaching of music, dialogics opens the way to an understanding of music from cultures that are different from ours, as it enables us to understand our differences, not as a problem or as a ground for segregation and discrimination, but as a present this multi-faced world gives us, a world we fail to fully understand. A synthesis based on this cultural diversity makes it possible to justify any ideology as what is not like us is arbitrarily sidelined. We should stop tackling music using the concepts of a simple causality or a dialectic that suits us and feeds our prejudices and, furthermore, reassures us by creating the illusion of objectivity. In the field of history in general and in the history of music in particular, these simplifications have proved to be very dangerous. For instance, it is obvious that the reason why some intervals in the music

¹⁸On this issue, see LEMOIGNE (Jean-Louis), "Edgard Morin, le génie de la Reliance"(Edgar Morin, the Genius of Reliance) on-line article in <http://ressources-cla.univ-fcomte.fr/gerflint/Monde4/lemoigne.pdf>

from the Maghreb still ring strange in the ears of the public is that they were banished from western liturgical music in the early Middle Ages. How can one explain, in this ideological minefield, the «objective», psycho-acoustic notion of discord? Furthermore, how and in the name of what so-called superiority, has our society claimed the right to justify these dictates? It is high time we acknowledged that most of our so-called «truths» in the field of art and music, are no more than the expression of our prejudices.

As for the teaching of music, we should accept, once and for all, that music cannot be measured only by the objective existence of carriers, but that it manifests itself as a presence *between* the sounds and the silences, as a dynamic *between* the acoustic sources and the emotions. This nature of music, as an *in-between* makes it, in many ways -and much to the despair of musicology- ineffable, impossible to grasp as a whole through discourse. Language itself is to blame for this difficulty due to the way it works. In fact, as the Stoic philosophers had already understood, language defines with instantaneous cuts in time, turning a process into a finite and limited number of concepts. But, at the same time, it finds it difficult to define and specify how the relations between these concepts work. Agamben, in his interpretation of Plato's 7th letter known as «Philosophical digression» (to pragma auto, «the thing itself»): “Language (our language) is necessarily pre-sub-positional and thematizing in the sense that in taking place, it decomposes the thing itself that is at issue in it and in it alone into a being about which something is said and a poison, a quality or determination that is said of it. Human language supposes and distances what it brings to light in the very act in which it brings it to light.”¹⁹

To teach music, we should learn how to operate with relations that cannot be measured using terms of simple causality. Dialogics is the right tool to do it because it brings out what is relational as opposed to what is conceptual. It prevents us from considering music as a dialectical process in which the contradictions need to be addressed if we are to achieve a synthesis.

Retroaction/Recursion

Retroaction, otherwise known as feedback, is the return of a consequence on the cause from

which it originated. A good example of retroaction is given by the act of listening to music and how it is linked with immediate memory. The listener not only listens to the acoustic events at play but he or she has to continually re-interpret this -what he or she hears- in relation to what he heard before, thus considering some hypothesis of a musical form and imagining from the elements at his or her disposal what the rest of the work might be. The retroaction that makes it possible for the cause and the consequence to exchange roles in turn is called recursion. Recursion lies in the question of what came first: the chicken or the egg. In musical composition, there is recursion between internal hearing and improvisation, as both in turn can be considered to be the cause or the consequence of musical creation. There is also recursion between symbolic representation and the musical realization of an idea. These interactive loops give rise to a spiral of in-depth analysis in which the internal image, on the one hand, and the symbolic representation, on the other hand, will be enriched by additional information that will emerge every time there is a reactualisation.

Hologrammatical Principle

In the holistic description of a phenomenon, the parts cannot be considered without a connection to the whole and vice versa. The hologrammatical principle goes even further: both, that is the part and the whole, are integrated into the other. They contain each other. In the field of music, this principle establishes an organic coordination between the micro and the macro-forms. So, within the chosen material, even that which seems the least significant, the global form of the piece is already inscribed, as a kind of anagram designed on it. This should clarify – in opposition to most of experimental music – why the material does not matter because of its individual or absolute value but because of its heuristic value in terms of temporal potentiality and potential development the realization of the work depends on.

CONCLUSION

Together with this last assumption, Webern's following sentence takes on its full meaning: “Our series, Schönberg's, Berg's and mine, are most of the time, the result of an idea that is related to a vision of the work conceived as a whole”.²⁰

¹⁹AGAMBEN (Giorgio), 2006 for the French edition, “La chose meme” (“The Thing Itself”), in *Le pouvoir de la Pensée essayes conférences (The Power of Thought, essays and conferences)*, translated from Italian to French by Joël Gayraud and Martin Rueff, Paris, Payot & Rivages publishing firm, p.16.

²⁰WEBERN (Anton), 1980 for the French version, *Chemin vers la nouvelle musique (A Path towards New Music)*, Jean-Claude Lattés publisher, p. 138-139.

Consequently, the musical form is a manifest intuition, not some kind of intellectual speculation. If the whole is already inscribed in the part, the former attracts the ideas, the images, the actions and the behaviours that will come while producing an energetic breath that will generate form.

The three principles mentioned suggest an indispensable dynamics to understand the interplay of multiple interactions that are at play through music. This interplay is a living, fluid movement that can be neither reduced nor superseded by a discursive interpretation.

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