

Listening Outside Time

Dimitris Exarchos (Goldsmiths, University of London, Great Britain)

ABSTRACT

This article is concerned with an opening between music and philosophy, discussing the ideas of Iannis Xenakis and Jean-Luc Nancy. As early as 1963 Xenakis presented the first elements of what was going to become an extended study of musical time, both in mathematical and phenomenological terms. His compositional investigation of outside-time structures intended to provide the foundations of a General Harmony, one that allows us to “distinguish structures, architectures, and sound organisms from their temporal manifestations”. Xenakis drew heavily on the ideas of Parmenides, fascinated by his materialism, and developed a thinking towards a musical ontology. Considering the notion of sound as materiality, we can explore the connection between Xenakis' thinking of temporality and Nancy's study of listening. Both engaged with a quasi-phenomenology in their questioning and employed independent but similar approaches. Rather than attempting a dialectical synthesis, this article hopes to allow for some space of resonance for the sensibilities that open up in the work of the two thinkers.

1. INTRODUCTION

As an “artist-conceptor”, in touch with musical and philosophical tradition, Xenakis engaged at length with an “unveiling” of the history of music; an unveiling of music and thinking beyond the reasoning of the logico-technical apparatus and its applications, in the course to capturing the force of theory, of questioning, of curiosity; a curiosity that would unveil reason as questioning. This unveiling, Xenakis notes, is to be taken in the sense expressed by Edmund Husserl in the *The Crisis of European Sciences* (see Xenakis, 1992, pp. 201 & 377 note 1); that is, instead of a conventional history of music (and its mathematisation), Xenakis aimed to “reconstruct the train of thought which motivated it” (Husserl, 1970, p. 23). Xenakis' demand for a thinking beyond the distinction between arts and science, still throws open the possibilities of an artistic praxis whereby questioning sets the terrain for future scientific research. His “Philosophy of Music” (published in 1966) was advanced at a time when his compositional practice was in search of an axiomatisation, whose starting point was to focus on the experience of sound, and therefore of time and space. In a Parmenidean gesture, Xenakis changed the question of time by advancing a denial. He dealt with the question of time by denying its perceived centrality, in a way similar to the Parmenidean denial of the question of change. Contrary to a general consensus that time in music is everything (for example by Stravinsky or Messiaen [see Xenakis, 1992, p. 192 & Varga, 1996, p. 83]) he interrogated the non temporal, that which is independent of time, that which remains once time has been removed.¹ In a sense, he got around the Heraclitean aphorism that everything flows, invoking the “first and absolute materialism” of Parmenides (Xenakis, 1992, p. 203).

Xenakis advanced his compositional technique in the light of such questioning. His axiomatics often took the form of an intense critique, and his practice was destined to provide further possibilities, such as his theory of sieves: his alternative to re-articulating the non temporal. The application of this logico-technical mechanism though, was not destined to provide any kind of closure of questioning. A recent study on listening by Jean-Luc Nancy brings into play a philosophical tradition, which, although Xenakis made only reference in passing (e.g. the aforementioned reference to Husserl), is found to be in contact with his thinking at various registers. The two will be allowed to resonance, I hope, in the third part of this article, after I explore the notions of temporality in Xenakis and of *sense* in Nancy, in the first two sections.

¹ “Que reste-t-il de la musique une fois qu'on a enlevé le temps?” (Xenakis, 1976, p. 211).

2. TEMPORALITY AND EXTERIORITY

We can see the Xenakian theory of temporality from two alternative perspectives, which however are not independent and overlap in several ways: in the early phase Xenakis usually demonstrated it in terms of composition or analysis—in short, in terms of music's mathematical or discursive aspects; later, he would be more concerned with the perception of temporality in listening—a sort of phenomenological approach (although in the early texts he also offered a psychological point of view, referencing Jean Piaget; see Xenakis, 1992, p. 160 & Varga, 1996, p. 82). His thesis was that both musical composition and perception take place mainly outside of time. We can locate the main originality of Xenakis' thinking in this kind of *exteriority* of the temporal experience: music takes place in the instantaneous present, but our experience takes place at the exterior of this “present”, or as Nancy would say, at the *external limit* of this present. The mathematical perspective involves a basic axiom and three categories of musical structure. “Time”, he said, “is nothing but a kind of structure. And [therefore] it can be counted, expressed with real numbers, and shown as points on a straight line” (Varga, 1996, pp. 82-3). The key to understanding his discovery is that time (like other aspects of sound), to the extent that it can be expressed with numbers, comprises a *totally ordered structure*; “ordered” here means that temporal intervals can be added to each other, permuted, etc. (that is, they comprise an abelian group) without having to use concepts of succession, such as “before” or “after”.² Whenever we can do this, we are describing a structure that is outside of time. From this fundamental discovery, Xenakis deduces three basic categories: a) outside of time, b) temporal, and c) inside time.³ Whereas the inside-time structure is the actual composition, the outside-time category refers to structures that remain independent of time; that is, structures that do not necessitate notions of causality in order to be described. As regards to the temporal category, Xenakis frequently made clear that this is a much simpler category and that time (in music) is a “blank blackboard” (Xenakis, 1992, p. 173 & Varga, 1996, p. 84) where structures or architectures are inscribed into (I will discuss this metaphor of writing later on); in other words, the temporal category (or “algebra” as he would also say) serves only as a means of rendering the music perceptible.⁴

2.1. Temporality, Dialectics, Ontology

The theory of outside-time musical structures is not a theory among others. In a sense, all of Xenakis' compositional tools (Stochastics, Sieve Theory, etc.) fall into the scope of his general view on composition that is partly concerned with unveiling the nature of time in music. This is a theory that describes musical structures in general, that includes his specialised theories, that refers equally to music perception and to analysis, and that shows a general underlying abstract thinking. Therefore, it is a theory in an indirect sense, a *metatheory* of composition. As mentioned, Xenakis' theories frequently took the form of a critique; although this aspect is beyond the scope of this article, it is important to note that Xenakis points out a progressive “degradation of outside-time structures of music since late medieval times” and this is “perhaps the most characteristic fact about the evolution of Western European music” (Xenakis, 1992, p. 193). By advancing therefore the argument that music takes place mainly outside of time, Xenakis challenged traditional preconceptions and attacked the mainstream avant-garde of his time.

From 1962 to 1969 Xenakis presented his classification of musical structures in various texts, which look at the *temporal* category from two alternative viewpoints: on the one hand, there is what we could call metric time

² Bear in mind that “order” does not refer to ordering in time, but generally to any well-defined arrangement of elements. Xenakis defined ordered structures as follows: “[‘Totally ordered structure’ means that] given three elements of one set, you are able to put one of them in between the other two. [...] Whenever you can do this with all the elements of the set, then this set, you can say, is an ordered set. It has a totally ordered structure because you can arrange all the elements into a room full of the other elements. You can say that the set is higher in pitch, or later in time, or use some comparative adjective: bigger, larger, smaller” (Zaplitny, 1975, p. 97).

³ The term *inside-time* refers to Xenakis' *in-time*.

⁴ This is the period just after the completion of *Herma* (1961) where he first employed logical functions, which later led him to a more extensive application of these operations and the development of his Sieve Theory. It could be said that, following the stochastic works of the 1950s, *Herma* and “Symbolic Music” mark the beginning of a new period in the evolution of Xenakis' thinking. It was at the beginning of that stage that Xenakis started to introduce considerations that undermine the classical view of the importance of time in music.

and on the other, causal time, which refers to the ordering of events, to how they succeed one another; moreover, in some texts he presents three categories and in other occasions only two, outside- and inside-time.⁵ In the interest of economy, I will not explore the texts in detail, as it has been already argued that Xenakis essentially conceived of two categories only, and that the temporal, from one text to another, collapses to either of the two sides of his classification (see Exarchos, 2008, Chapters 1 & 2; cf. Solomos, 2004, p. 126). It will suffice to look at this only briefly: in the tripartite classification of “Symbolic Music” (1963) the temporal category and the outside-time one share the same algebra and their mapping constitutes a structure inside time (Xenakis, 1992, p. 160); whereas in “La voie de la recherche et de la question” of 1965, in a simple dichotomy, the inside-time nature is the direct result of the relation between the outside-time category and time as such, or “pure” time (Xenakis, 1994, p. 68). This reveals that for Xenakis there seemed to be two different lines of thought when he placed the temporal in relation to the other two categories; and this is shown by the fact that the middle category is related to the other two in two different ways. On the one hand, time is (in a secondary sense) included in the outside-time category as their corresponding algebras are identical; on the other, it is shown to be “rhythm in its pure form”. The temporal structure takes different guises: from an entity that is simpler than the sonic event itself, to pure inside-time music; or from metric time to time as rhythm in a much more general sense than metre. But this is another phrasing for the dichotomy of outside/inside-time, of metric time and of pure time flow.

This dualistic but intricate thinking is summarised in Xenakis' final publication for this period, written in 1968, which talks about two categories but with a “triple correction”:

“There is a mental crystallisation around two categories: ontological, dialectical; Parmenides, Heraclitus. Hence my typification of music, outside-time and temporal that lights so intensely. But with a triple correction:

- a) in the outside-time, time is included,
- b) the temporal is reduced to the ordering,
- c) the ‘realisation’, the ‘execution’, that is the actualisation, is a play that makes a) and b) pass into the instantaneous, the present which, being evanescent, does not exist.

Being conscious, we have to destroy these liminal structures of time, space, logic... So with a new mentality, with past, future and present interpenetrating, temporal but also spatial and logical ubiquity. That's how immortality is. The omnipresent too... without flares, without medicine. With the mutation of the categorising structures, thanks to the arts and sciences, in particular to music, obliged as she has been recently to dive into these liminal regions” (Xenakis, 1969, p. 51).⁶

The outside-time category remains more important, whereas the inside-time is named as the instantaneous, that which does not exist. In other words, Xenakis' philosophy was in search of an ontology, rather than a dialectics, or even a phenomenology proper; an ontology where tenses “interpenetrate”. This is why it would be more appropriate to talk about a quasi-phenomenology which offers the possibility for Xenakis' musical ontology. (If anything, one should be cautious when one talks about music in terms that relate to the appearing of phenomena.) This notion brings us closer to the later phase of his theory, to be developed mainly in the 1980s.

⁵ The tripartite classification appears in “Symbolic Music” of 1963 (and its predecessor “Trois pôles de condensation” of 1962) and in “Towards a Metamusique” of 1967 (and its manuscript, “Harmoniques (Structures hors-temps)” of 1965); the simple dichotomy of outside/inside-time appears in “La voie de la recherche et de la question” (1965) and “Towards a Philosophy of Music” (1966) (for original publication dates and reprints, see Solomos, 2001).

⁶ “Il y a une cristallisation mentale autour de deux catégories: ontologique, dialectique; Parménide, Héraclite. D'où ma typification de la musique, hors-temps et temporelle qui s'éclaire ainsi intensément. Mais avec une correction triple:

- a) dans le hors-temps est inclus le temps,
- b) la temporelle est réduite à l'ordonnance,
- c) la « réalisation », l' « exécution », c'est-à-dire l'actualisation, est un jeu qui fait passer a) et b) dans l'instantané, le présent, qui étant évanescence, n'existe pas.

Il faut, étant conscients, détruire ces structures liminaires du temps, de l'espace, de la logique...Mental donc neuf, passé futur présent s'interpénétrant, ubiquités temporelle mais aussi spatiale et logique. Alors l'immortalité est. Le partout présent, aussi... sans fusées, sans médecine. Par la mutation des structures catégorisantes, grâce aux sciences et aux arts, en particulier à la musique, obligée qu'elle a été de se plonger dans ces régions liminaires récemment”. (My translation.)

2.2. Time, Space, Music

Moving on to the quasi-phenomenological approach, one of the key terms to understanding Xenakis' thinking of temporality is that of *separability*, or discreteness. It is thanks to the fact that events are discreet that we are able to perceive them in temporal (or other sort of) relations with each other and subsequently experience these events as members of an ordered structure.⁷ In a sense, when we perceive sonic events we assign to them temporal intervals, where the unit is a kind of greatest common divisor, a common measure.⁸ (This is why Xenakis referred to a minimum of three events in his demonstration: we need at least two temporal intervals in order to deduce a unit and compare them with each another.⁹) His formulation is as follows: the temporal events we perceive, due to their separability, are assimilated to landmarks points, and thus leave their *trace* in our memory; we then assign distances between these traces and compare them; therefore, we have placed them outside of time (Xenakis, 1992, p. 264-5).

In his essay, “Concerning Time, Space and Music”,¹⁰ time and space are considered inseparably interlinked; he would say that time is not absolute, yet “it is always there” (Xenakis, 1992, p. 256). Time and space are not simply commensurate, especially when they are not defined simply as duration and as extension—and Xenakis avoided this definition. He would refer to space as the appearance of “chains of energy transformations”, such as the displacement, the movement of a photon, which in turn implies a certain temporality (Xenakis, 1992, p. 257). A displacement in space is only reducible to transformation chains if we accept the notion of *contiguity*, that is the state of being in direct contact. The linking of space and time (due to the relativity of time) allowed Xenakis to pose the question of contiguity. “What would the pavement of the universe be if there were gaps between the paving stones?” (Xenakis, 1992, p. 256). Although these points have no direct relation to music, they indicate that Xenakis' thinking of time and space presupposes a certain materiality. Therefore, not only the notion of separability, but also the notion of contiguity of matter, of direct contact, is an essential presupposition for the temporal experience.

A final key term in Xenakis' exposition is that of *anteriority*, or succession. This concept, as opposed to simultaneity, is interrogated by means of a thought experiment: “two chains of contiguous events without a common link can be indefinitely synchronous or anterior in relation to each other; [thereby] time is [...] abolished in the temporal relation of each of the universes represented by the two chains” (Xenakis, 1992, p. 263). We see therefore, that for Xenakis, on the one hand synchronisation or *simultaneity* abolishes all temporality between the two universes of events; on the other hand, contiguity and anteriority articulate, due to separability, the “non-synchronization” of time. That is, the “removal of time” is the removal of anteriority, and what remains is the simultaneity of all members of a mathematical set that has an ordered structure (such as a scale, a sieve, etc.).

I hope that so far the themes of exteriority, separability, contiguity and the materiality these imply, as well as the notion of the trace, have offered a general overview of Xenakis' complex and original thinking of temporality. Let us now move on to another register, where the same themes are modulated in purely philosophical terms; in particular, Jean-Luc Nancy's philosophy with its preoccupation with listening and its relation to 20th-century phenomenology. It is important to keep in mind that, as we will see, Nancy's philosophy does not subscribe entirely to this tradition, although it draws heavily on it; in some ways, it is also a quasi-phenomenology, as it does not focus on consciousness.

⁷ This is true for several aspects of the sonic event, such as pitch or duration, but obviously not for timbre (cf. Varga, 1996, p. 83).

⁸ Xenakis here would also point at Bertrand Russell saying (in his case, in relation to the axiomatics of numbers) that there is “no unitary displacement that is either predetermined or related to an absolute size” (Xenakis, 1992, p. 195).

⁹ “Three events are distinguished; the time intervals are distinguished; and independence between the sonic events and the time intervals is recognized. An algebra outside-time is thus admitted for sonic events, and a secondary temporal algebra exists for temporal intervals; the two algebras are otherwise identical” (Xenakis, 1992, p. 160).

¹⁰ In 1981 Xenakis published an article called “Le temps en musique”, which was extensively enlarged and published as “Sur le temps” in 1988. It then appeared with additional material as chapter X in the revised edition of *Formalized Music* in 1992, titled “Concerning Time, Space and Music” (see Solomos, 2001).

3. SENSE AND EXPERIENCE

Jean-Luc Nancy's philosophy is associated with the phenomenological tradition of Edmund Husserl and Martin Heidegger, to the extent that it deals with materiality, body and space. For both philosophers, the spatiality of phenomenology can never be separated from the temporal nature of experience. Husserl used the term *kinesthetic* to emphasise the importance of movement in perception and of temporal intentionality in conscious experience; in this sense, moments of sensation always incorporate past and future elements in a movement of retention and anticipation (or *protention*, as he called it) (see James, 2006, p. 78). Moving away from the isolation of pure consciousness, allowed by Husserl's phenomenological reduction, Heidegger was more interested in perception as the purposeful involvement in the concrete world. For him, the structure of temporality is "ecstatic", in the etymological sense of "standing outside of"; that is, spatiality is not an entity, but an *event of disclosure* (see James, 2006, p. 84). These notions imply that experience is an exteriority, a standing outside of itself or "ek-stasis"; and that the spatiality of experience depends also on a temporality, incorporating a past and a future in order to constitute a present.

Nancy's take on those issues is at very close proximity with phenomenology, but properly speaking, he does not put forward a phenomenological account. If from Husserl to Heidegger there is a transposition from the internal sphere of experience to that of the world and of the *being-there*, in Nancy we find a thematic modulation to the domain of sense. The phenomenology that Nancy inherited (and their point of contact) insists on the pragmatic, physical engagement with the world. The crucial difference, in summary, is that where Heidegger spoke of space as a context of significations, or a system of relations, Nancy's thinking relies on the notion of *sense*, a word that incorporates both *sensibility* and *meaning*. Sense, as the sensible and the intelligible, is not material in itself, but presupposes a materiality, and this allows for the formulation of a materialist, bodily ontology. In short, it is not that the world makes sense, but it exists *as* sense, *prior* to the existence of language, but at the same time *beyond* all signification. So, radicalising Heidegger's argument (who reserved for language and significance a fundamental role in his ontology) for Nancy there is always an ungraspable *excess* of sense (of the world which is always already constituted as sense); from this follows a decisive break with phenomenology, as consciousness is no longer the focal point.

The excess of sense that Nancy is thinking implicates the relationship between experience, signification and materiality. Before looking at this more closely, one could possibly think Xenakis' categories in the above terms. The domain outside of time, is where signification occurs, whereas inside time music is experienced in all its materiality, placed in the instantaneous present as an event of disclosure. Intelligibility is gained by the placing of rhythm outside of time; that is, by the musical experience which involves an engagement with both past and future moments. In other words, a provisional, first reading would indicate a schema of correspondence between the outside of time as the intelligible and the inside-time as the sensible. However this would be too hasty: it would ignore the *movement* of sense, the temporality of engagement in listening, and would eventually result in a traditional metaphysical dichotomy.

3.1. Exteriority, Limit, Touch

It is precisely the materiality and the simultaneous excessiveness of sense that allow Nancy to go beyond the dichotomy of transcendence and immanence in relation to consciousness, and to use corporeal terms: touching, contact, spacing, separation, all imply a certain exteriority and an impenetrable concreteness, therefore, a *limit*. Nancy takes sense as an active engagement with the concrete world. The materiality of the latter essentially implies an impenetrability, which brings again into play the notion of exteriority, and more precisely, of the external limit. The active nature of sense implies that what senses is a body and that sensing is always related to a temporality. Therefore, the primary sense for him is that of touch: of palpating on the external border of impenetrable matter.¹¹ The corporeal takes place at the limit of sense, at the external border: thus, bodies, as bodies of sense (that is, not as objects of discourse or of science), "*take place neither in discourse nor in matter.*

¹¹ "It is not a matter of signification, but of the sense of the world as its very *concreteness*, that on which our existence *touches* and by which it is *touched*, in all possible senses" (Nancy, 1997, p. 10).

They inhabit neither 'the mind' nor 'the body'. They take place at the limit, *as the limit*" (Nancy, 2008, p. 18). The movement of sense takes place according to an intricate interrelation with matter and with signification; in his classic *Being Singular Plural* Nancy points out a subtle but important difference: "Either as an audible voice or a visible mark, saying is corporeal, but what is said is incorporeal. [...] Language is not in the world or inside the world, as though the world were its body: it is the outside of the world in the world" (Nancy, 2000, p. 84). Bodies *touch* on matter (as impenetrable concreteness), while sense (as the bodily event) exists on the outer limit of language, although simultaneously being the site where language can occur. The mode of this interrelation is *touch and separation*, and not continuity or mediation. Touch, in this sense, is not the mediation, but the condition for perceiving the world, which is impenetrable but palpable; touch is therefore primarily about impenetrability and less about proximity.

3.2. Materiality, Meaning, Sound

Materiality, sense, meaning, limit; these terms are central in all of Nancy's philosophy, but do not appear in the form of one complete account. Rather, they are dispersed in several of his works, including his recent text on *Listening*.¹² Sound is taken to be sonorous materiality, and for Nancy the general question is whether sound and meaning might share a space, and what kind of space might that be. In order to be able to see the formulation he achieves, it is helpful to keep in mind the relation between sense, materiality and signification—and their touch at the limit. The contact of sound ("that is musically listened to") with signification, Nancy says, takes place at the sharing of the referral; meaning is made up of references (from sign to thing, and so on), whereas sound, spreads in space as resonance, in a sounding that is always already a *re-sounding*:

"One can say [...] at least, that meaning and sound share the space of a referral, in which at the same time they refer to each other, and that, in a very general way, this space can be defined as the space of a *self*, a subject. A *self* is nothing other than a form or function of referral: a self is made of relationship *to self*, or of a presence *to self*, which is nothing other than the mutual referral between a perceptible individuation and an intelligible identity" (Nancy, 2007, p. 9).

By sonorous materiality here we must think of the vibration that animates the auditory body; the function of the referral is found in the reverberation, its opening up to the resonant body and its vibration, its self-reference. Nancy would go on to relate sound, meaning and temporality: "music [...] anticipates its arrival and remembers its departure, itself remaining suspended and straining between the two: time and sonority, sonority as time and as meaning" (Nancy, 2007, p. 20). Resounding and language share the referral in the spacing between the sounded and re-sounded, the said and re-said. Signification, as a system of references, is the spacing of the referral: "Every spoken word is the simultaneity of at least two different modes of that spoken word; even when I am by myself, there is the one that is said and the one that is heard, that is, the one that is resaid" (Nancy, 2000, p. 86). Another key word for this is that of *echo*: its rhythmic self-referral is the condition of sonority but also the condition of signification (or the condition of sense). Sense, as the touch at the limit of matter, and as the beyond of signification, is "first of all the rebound of sound", which, moving away from signification, "consists [...] in a listening, where only resonance comes to resound" (Nancy, 2007, p. 30).

3.3. Exscription

The formulation I am putting forward here is useful for us, in order to think Xenakis' approach to time, timbre and rhythm. In particular, the interconnection of sound as sonorous materiality with language as signification, can help concentrate on the importance of sense in understanding Xenakis' formulation. *Writing* (including mathematic signification) has been used extensively by Xenakis as a metaphor in relation to time, either directly or indirectly, when he suggested the *trace* as point of reference. Although he did not interrogate the function of writing as such, we must take this term as suggested by Jacques Derrida (who has influenced Nancy greatly). For

¹² *À l'écoute* (Paris: Galilée, 2002) is an adaption of "Être à l'écoute," in *L'écoute*, ed. Peter Szendy, 275-315 (Paris: IRCAM; and Montreal: L'Harmattan, 2000). For the English edition of *Listening*, translated by Charlotte Mandell (New York, Fordham University Press, 2007), Nancy has included two additional texts: "March in Spirit in Our Ranks" and "How Music Listens to Itself".

Derrida, the term writing suggests an originary rupture of all identity, a foundation with no foundation, so to speak, in a process of inscribing and effacing of signifying traces; or, as Spivak puts it, it is “the structure always already inhabited by the trace” (Derrida, 1997, p. xxxix). Writing is important for Nancy in relation to *techne*, as the interconnection of sense and material bodies; that is, not so much as the iteration of traces, but as the touch-separation of impenetrable matter and sense (or bodies as sense) (see James, 2006, pp. 147-8). At the same time, sense, although it provides the context for signification, it is a bodily event that is outside of signification. In order to account for this exteriority in relation to inscription, Nancy uses the term *exscription*; as Ian James puts it, “exscription [...] describes the relation of exteriority, or separation which is maintained between impenetrable matter and bodily sense, and between bodily sense and linguistic signification” (James, 2006, p. 149). Or in Nancy's words, “writing takes its place at the limit. So if anything at all happens to writing, nothing happens to it but *touch*. More precisely: touching the body (or some singular body) *with the incorporeality of 'sense'*” (Nancy, 2008, p. 11). The notions of exteriority and the limit have interesting implications in relation to Xenakis' own thought: the “liminal regions” of “time, space and logic” have to be overcome in the search of a musical ontology, where music does not belong to the instantaneous present any longer. In this sense, exscription can be thought as the process whereby temporal structures are being placed outside of time. These repercussions between Xenakis' and Nancy's thinking relate as much to their conception of space-time as to their take on the nature of listening.

4. CONTEMPORARY TIME

The question of contiguity, of direct contact, was posed by Xenakis in light of the discovery of the relativity of time. The proposals of a possible quantic structure of time, allowed Xenakis to take the question further: “what could a quantified time and space signify, a time and space in which contiguity would be abolished?” (Xenakis, 1992, p. 256). The two chains in the aforementioned experiment have no common link and there is no mediation between the two. This immediacy is for Nancy not “an absence of exteriority. On the contrary,” he says “it is the instantaneous exteriority of space-time (the instant itself as exteriority: the simultaneous)” (Nancy, 2000, p. 68). We see therefore, that for Xenakis, on the one hand synchronisation or simultaneity abolishes all temporality between the two universes of events; on the other hand, contiguity and anteriority articulate, in a sense, the “non-synchronization” of time.

Thus, time-space as perceived by Xenakis is experienced as the spatio-temporal linking of simultaneity and anteriority. The latter accounts for temporality in the context of a singular instance of Xenakis' chain of events. In the plural, in the simultaneous plural, the absence of anteriority between the two chains is (in the example given, but in any case, potentially) the condition for what Nancy would call *contemporary time*. The linking of time and space that Xenakis locates early in his exposition, appears more decisive in Nancy's formulation as the *spacing of time*; more precisely, he says that “time cannot be the pure [instant], or pure succession” (or anteriority, in Xenakis' terms), “without being simultaneity 'at the same time'. Time itself implies 'at the same time'. Simultaneity immediately opens up space as the spacing of time itself” (Nancy, 2000, p. 61).

For Xenakis then, time in music is seized only indirectly, due to its non-synchronization with reference-events, whose disappearing leave traces in our memory. The trace thus takes the place of one of the two chains of contiguous events. In turn, the condition of trace (and therefore of temporal experience) is the contiguity of events, and their discreteness. It is the notion of separability that enables signification, in the form of the trace, and therefore renders a palpable sense to the temporal flux; in Xenakis' own words, “separation, bypassing, difference, discontinuity, which are strongly interrelated, are prerequisite to the notion of anteriority” (Xenakis, 1992, p. 262). The same themes recur here, the themes we find in Nancy's formulation in relation to touch, as the sense which implies discreteness, exteriority, materiality, and impenetrability. It is also interesting here that Xenakis thinks of the trace as the function that allows the interpenetration of the tenses: “in music, when you are composing or listening, part of the past engages you in the future” (Harley, 2002, p. 13). In a way, this echoes Husserl's account of retention and protention, the temporality of the phenomenological experience, and the Heideggerian exteriority of this temporality. A more detailed account is given by Xenakis' aforementioned

axiomatization: the landmark points, their trace in our memory, are “instantaneously hauled up outside of time” (Xenakis, 1992, p. 264). We see that the second chain of events is none other than the trace of the events of first; that this other chain of events is hauled up outside of time by retentions and protentions, and that were it not for such a kind of engagement, time would collapse to unitary, absolute interiority; we see that, as Nancy would have it, every sonic event is the simultaneity of at least two different modes of that event, and the exteriority of such an experience, the exteriority of the materiality of sound and the exteriority of writing, exists in the mode of touch and of exscription: in a sense, the *writing-outside* of time.

This thinking provides a slight complication in Xenakis' formulation: temporal events exist *simultaneously* with their own trace, in a spacing of time that takes place due to the excess of sense—of listening as touch. Nancy has shown that what enables the spacing of the function of referring in language, is the simultaneity of the said and re-said, and in music, of the sounded and the re-sounded. In Xenakis' terms, the concept of simultaneity stands for what remains—as a trace—once time has been removed. But, according to Nancy's notion of contemporary time, simultaneity is a necessary implication of the spacing of time. Therefore, the outside-time aspect of music is a necessary implication in any musical system or technique, but also always already at work in musical experience as such. The relationship, on the one hand, between listening and meaning and on the other, between listening and sound is intricate precisely because of the excess of sense that Nancy takes as his axiom: listening is both the condition and the beyond of signification. Listening, as the musical sense, consists in a movement, or a *tension* that takes place on the limits of sonorous matter and of linguistic signification; but only on the condition that, as sense, it exceeds all signification, while at the same time it provides the context for it. The excess of the sense of listening therefore is responsible for the extra-temporal experience of music, that is, for placing rhythm outside of time, but also for the experience of the materiality of musical sound itself.

It is possible then to think of Xenakis' temporal category as the site of touch on the limit, on the one hand, between sense and sonorous materiality (the inside of time as it were), and on the other, between bodily sense and linguistic signification, with its traces, its assigning of intervals, its exscription (that is, its placing outside of time). Xenakis proposed Sieve Theory as a response to articulating the outside of time and as a method for the articulation of timbre. But this was not destined to provide complete solutions; for instance, in relation to electroacoustic music Sieve Theory remained an unfinished project. However, Xenakis' increasing preoccupation with timbre (in sound synthesis, but also in his acoustic compositions with the slowing down of tempo) indicates that for him sonorous materiality remained central in the quest for a palpable sense of music. Many of his theories were applied only in a fragmentary way; his music too, was never in search of totalizing answers—it became more and more fragmented itself (even up to his very late works, with no beginning, nor end articulated as such). He remained an “artist-artisan”, engaged in the process of constructing concrete works, be it the musical concrete or the architectonic.

As such, as an artist of the concrete, Xenakis exposed the conditions of listening to an impenetrable sonorous concreteness. As I have argued, what both Xenakis and Nancy sought after is an ontology of sound that does not focus on language or consciousness; in this process, phenomenological considerations are means to an end. For Nancy, this end means to envisage sense as a resonance beyond signification; body as a resonant space; and subjectivity as the self that is listening to the beyond-meaning (see Nancy, 2007, p. 31). If the self is nothing other than a function of referral, and if resonance is nothing but the timbre and reverberation of sound, Xenakis sensed that to listen entails an *ek-static* subject; a listener, an artist, a self, outside of time, exposed to the world, but also gaining access to it, through a music that, as it were, never stops listening to itself. A music that “never stops exposing the present to the imminence of a deferred presence, one that is more 'to come' [*à venir*] than any 'future' [*avenir*]. A presence that is not future, but merely promised, merely present because of its announcement, its prophecy in the instant. Prophecy in the instant and of the instant: announcement in that instant of its destination outside of time, in an eternity” (Nancy, 2007, p. 66). Perhaps Xenakis' prophecy will prove to be a thinking across the boundaries of science and the arts, of a passage of sense which is neither transcendent nor immanent, but which exposes a world that is created, incessantly, as *techne*, as an incessant auto-creation. Music, in its capacity to engage thinking, listening, touching, was for Xenakis a hope for gaining access to the world, to the unheard-of, to the beyond signification; in short, a hope for an inexhaustible resonance.

5. REFERENCES

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