

Ekphrasis in the work of Iannis Xenakis

Author: Thomas Metcalf, Faculty of Music, University of Oxford, thomas.metcalf@worc.ox.ac.uk –
www.thomasmkmetcalf.com

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Abstract

This paper explores aspects of Xenakis's work through the Ancient Greek concept of 'ekphrasis'. The concept of ekphrasis is defined by Michael Squire (2021) as 'refer[ring] to the literary and rhetorical trope of summoning up – through words – an impression of a visual stimulus, object, or scene'. Early examples include Homer's description of the shield of Achilles in the Iliad, with a more modern, well-known example being Keats' Ode to a Grecian Urn (1819). Ekphrasis is a concept bound up with the representation of one medium in another, and subsequent research has expanded study to incorporate other forms of art, including music. Siglind Bruhn's 'musical ekphrasis' describes the ekphrastic process of 'transmedialisation' as 'the musical representation of a text created in a non-musical sign system' (Bruhn, 2008). It is here where applications to Xenakis's work become apparent, particularly with respect to my own work on 'graphical ekphrasis', which goes further in decentralizing concepts of 'artwork' to encompass any visual text.

This initial part of the paper focuses on Xenakis's famously 'graphic' works, which utilise techniques such as ruled surfaces and arborescences (e.g. *Metastasis*, *Erikhthon*, *Evryali* etc.) to posit notions of ekphrasis in his work, and the exhibition of this 'transmedial' discipline. As Bruhn notes, two components of a transmedialisation are 'depiction' (the formal features) and 'reference' (the cultural context). Xenakis's work is interesting in that it relies heavily on depiction - i.e. sounding out the specific graphical construction - at the cost of 'reference'. This radical thinking is at once the most divisive and inspiring aspect of Xenakis's work, and has led to the redefinition of fundamental musical techniques (e.g. glissando) and ideas. Some brief and novel ideas on *Erikhthon* as an ecological work will demonstrate how meaning can be structured when applying an ekphrastic framework to traversing Xenakis's music.

This drive for 'depiction' is where the schism between sonification (e.g. Scaletti 2011) and ekphrasis (and indeed representation and abstraction) is laid bare and, in Section 4, I propose an aesthetics of Xenakis's music as ekphrasis in terms he often used himself: that of logic. The recent publication of Hans-Werner Heister's *Music and Fuzzy Logic* (2021) is an ideal starting point to probe this wider transmedial spectrum in Xenakis's music. This is explored with reference to Jean-Jacques Nattiez's *Music and Discourse* (1990) in referring to the listener- and composer-centric models for transmedial aesthetics.

This survey concludes the importance of the interdisciplinary in the aesthetics of Xenakis's work, echoing Daniel Albright's (2014) notion of Xenakis's 'intermedial perfection', articulated through notions of ekphrasis, paying particular attention to Xenakis's own commentary on transmediality in his writings to build a picture of how these came to define new narratives of the man and music, and what they can teach practicing transmedialists today. Moreover, the frameworks explored can allow for further engagement with the larger body of Xenakis's work, encompassing electroacoustic and computer music, thus supporting further aesthetic research.

1. Introduction

A common theme in much of Xenakis's writing is the notion that music should aim to represent certain phenomena, things, or ideas. As such, one might attempt to situate him in the realm of other

composers who allude to extra-musical ideas within their work, such as in much programme music – but this would be a false relation. Indeed, his approach hinges more upon the notion of translation of such ideas in a very direct sense, treating the extra-musical as the real ‘musical’ text. This is outlined in a reflective moment in his conversations with Vargas:

That’s my contribution to the development of music: I use ideas in composing that are completely alien to music. (2003: 79)

This equivalency of the non-musical and musical texts allows us to view Xenakis’s work with respect to the concept of ‘ekphrasis’, which is defined by Michael Squire (2021) as ‘refer[ring] to the literary and rhetorical trope of summoning up – through words – an impression of a visual stimulus, object, or scene’ - a notable example being Keats’ *Ode on a Grecian Urn* (1819). Siglind Bruhn has contributed greatly to the expansion of the concept of ‘musical ekphrasis’, defining the term as ‘the musical representation of a text created in a non-musical sign system’ and describing this act as ‘transmedialisation’ (2000: 8). In this way, we might consider Xenakis’s creative practice as being centred on this ‘transmedialisation’ of, often visual, stimuli. My own contribution to this field, graphical ekphrasis,¹ privileges the specifically spatial properties in the act of transmedialisation, positing a decentralisation of the ‘artwork’ to encompass any visual representation as having transmedial potential, echoing Daniel Albright’s position that ‘[a]nything is an artwork to the extent that it looks made.’ (Albright, 2014: 4) This has further currency in aiding a reading of Xenakis’s works - particularly when considering the often abstract, and self-designed subjects which create this visual/musical equivalency. This enquiry feels apt when considering Xenakis’s disposition towards ancient Greek concepts, describing himself as ‘a Classical Greek living in the twentieth-century’ (in Matossian, 1986: 11), with pianist Claude Helffer describing a ‘specific feature’ of Xenakis’s aesthetics as:

[H]is Pythagorean concept of the interpenetration between all domains; for example, what is beautiful on a mathematical level will maintain this aesthetic character when transposed into other sectors of knowledge or art. The beauty of his arborescences drawn on graph paper will also be beautiful when transposed into Evryali or Erikhthon. (in Kanach 2010: 114-115)

This notion of self-design (i.e. drawing his own ekphrastic subjects) is one of the most interesting aspects of Xenakis’s practice. It would seem that, unlike a traditional approach to ekphrasis, Xenakis was unable to find pre-existing representation of the music he sought to compose. In a later passage in his conversations with Vargas he claims that, ‘[t]he drawing and thinking of the sound-image go hand in hand, the two can’t be separated ... we have also to be able to find on paper the visual equivalent of the musical idea’ (2003: 90). This clearly shows how the relationship between the visual and music is not unidirectional, and operates as a holistic ‘whole’ of a process. This can be confirmed with interpretations of Xenakis’s work outside of music, with Sharon Kanach noting that ‘Iannis Xenakis’ architecture can be regarded as a transposition in space of what occurs in his music in time and pitch’ (2008: xii), which neatly shows Albright’s notion of an ‘intermedial perfection’ in Xenakis’s philosophy (2014: 265).

The methodology behind this paper will focus on a component of Bruhn’s framework in musical ekphrasis, that of the categories of ‘depiction’ and ‘reference’:

I wish to argue that what and how music communicates about any extra-musical stimulus does

¹ See T. Metcalf, *Graphical Ekphrasis in Contemporary Music*, PhD Thesis, Oxford University, 2021; or for a brief introduction, T. Metcalf, ‘Graphical Ekphrasis: Translating Graphical Spaces into Music’, *Question*, AHRC, 2020, pp. 78-91.

indeed fall into the two categories that can be seen as analogous with those pertinent in the context of painting and poetry: depiction and reference. I use depiction by musical means as encompassing not only instances of mimicry ... but also sensual impressions of hues, shapes, and spatiality. Correspondingly, reference by musical means ... will be understood as relying on cultural and historical conventions. (2000: 11)

It is clear that depiction is pertinent to the formal aspects of an extra-musical source; in essence allowing the music to 'mimic' it. In this category, one may designate musical structures, and relationships between musical parameters as preserving the minutia of relationships that make the source work identifiable, and thus the ekphrasis clear. Contrastingly, 'reference' invokes an aspect of style that situates the work in a cultural or historical convention; it is not the relationship of materials that aids ekphrasis, but rather their presentation through a stylistic lens. This concerns aspects of instrumentation, musical tropes, and the contextualisation of the 'depiction' within a wider musical context. Through an initial examination of Xenakis' works which have illuminating sketches (and thus a very clear relationship to the visual), I will discuss how ekphrasis could be applied, and provide useful insights into better understanding Xenakis's transmedial practice, and suggest that his prolific mentions of 'intuition' in the creative process can create a schism between ekphrasis and tangential concepts of sonification and fuzzy logic.

2. Revisiting 'ruled surfaces': *Metastasis* and the glissando

Metastasis (1953-54), for orchestra, is perhaps the most well-known example of Xenakis' initial experiments in transmediality, whereby the music has a link to architecture, more specifically the Phillips Pavilion. The oft-cited sketches make clear the creation of hyperbolic paraboloid curves constructed of straight lines, or 'ruled surfaces', which serve to create a similarity in the design of the music with that of the architecture. Indeed, Xenakis comments that:

'In my composition *Metastaseis* ... the role of architecture is direct and fundamental by virtue of the Modulor. The Modulor was applied in the very essence of the musical development' (in Kanach 2008)

A transmedial link is created not only on a visual sense, but by virtue of using the Modulor, a design tool developed by architect Le Corbusier (relating to anthropometric proportions). We see the non-musical influencing the musical, and thus can claim that this is a holistic incorporation of the architectural design (rather than a mere allusion), and the beginnings of a move towards a 'general morphology', defined by Elizabeth Sikiardi as: 'research concerned with the understanding of form and its generation ... an interdisciplinary effort, corresponding to Xenakis's universal thinking and 'transfer' practice' (2006: 203). This 'transfer practice', or indeed one might say 'transmedial practice', is at the heart of applying ekphrasis to Xenakis's work.

Through an ekphrastic reading, one might argue that the scrupulous level of detail for the vast number of players ensures a high level of 'depiction' within the transmedialisation process: the rendering from visual to audio is clear, and easy to follow. However, when considering 'reference' (cultural or historical aspects) we see no resemblance; it creates a totally novel sound. Kanach claims that the use of glissandi in *Metastasis* (the most accurate continuous representation of any two given linear points in a pitch time space) is a 'signature contribution to the evolution of musical thinking in the second half of the twentieth century' (2010: 113-114). Its referential lack can explain the response of the serialist movement, themselves a group with a fierce predilection towards musical organicism, denouncing the Donaueschingen premiere as 'full of protoplasm' and 'crammed with glissandos' (Kim, 2000). The glissando would come to define much of Xenakis's later music, a kind of aural signifier in the sense of both a compositional 'style' but also a gesture towards transmediality itself,

and its underlying creative principles (which link to more historic, ancient Greek aspects). Theoretically, this piece could be considered an example of graphical ekphrasis, and in this sense its referentially in the present day is self-fulfilling: one hears such extensive glissandi, and its new status as transmedial signifier creates the historic and cultural reference point. One wonders how *Metastasis* as ballet, choreographed by George Balanchine in 1968, might provide further thoughts when considering the extra transmedial step.

3. Arborescences

3.1 *Arborescence as struggle: Evryali*

The arborescence is another heavily visual feature which can be said to be transmedialised in Xenakis's music, a notable example being *Evryali* (1973), for solo piano. Described by James Harley as 'both more poetic and enigmatic' (2004: 79) than earlier pieces which exhibited characteristics of arborescences (such as *Synaphai* (1969)), *Evryali* very clearly demonstrates the possibilities (and indeed, limits) of the form. Indeed, one might consider it a 'proof of concept' work when considering its exceptional nature within the solo piano works, with Ronald Squibbs noting that the work is 'unique' in its utilisation of a single unit of duration is adopted almost entirely throughout (semiquavers at minim = 60) (1996: 147).

Evryali has been written on extensively, so I will not delve into its specific details, but rather pick up on the phenomenal aspect of the work, in the fact that in its first iteration, it is impossible to play: the 'off the keyboard' C-sharps being a prime example (which were corrected in later versions). This demonstrates the incredibly heightened aspect of graphically ekphrastic 'depiction': the system is followed through with total fidelity, rather than compromise. Indeed, on compromise, pianists writing on this work note the necessity of 'struggling' with the work, creating reductions to enable it to be played:

Supreme challenge: he asks us to take risks and overwhelming responsibilities. I find it wonderful that instead of saying to the performer 'I have written this piece for you, and you are going to play it,' he said to me 'Here is the piece. Look at it, and if you think you can do something with it, play it' (Bucquet 1981 in Harley 2004: 80).

Therefore, the transmedialisation of the arborescence patterns manifest challenges both in theory (the score) and practice (performance). The use of the title, which effectively 'frames' the ekphrastic process therein, alludes to this struggle (fighting the Medusa, Gorgon, etc.) and conveniently rationalises the depictive nature of the ekphrasis by placing it within a referential cultural context of the Greek myth and also the sea, aided by what Harley describes as 'wavelike contours' found within the music. It is noteworthy that the piece originally had no title when Bucquet confronted it, and that *Evryali* came a month and a half later after Xenakis heard the first few pages. (Bucquet in Kanach 210: 67) Indeed, Xenakis uses similar language of 'struggle' in the context of art and abstraction:

When the artist works, he may think that he is composing with sensibility because he is attracted by some ideas or by some other things. That might be the starting point sometimes, but in the course of the work, things start 'living' and he's fighting with these things all the times, changing them and being changed by them, so the starting point of his feelings becomes very remote. What remains finally can be expressed in a much more abstract way because it's the result of that thought'. (Zaplinty & Xenakis, 1975: 91)

This supplements Xenakis's comments relating to the 'inner richness of the hand' when creating his

graphic sketches, and the balance between ‘intuition’ and realisation of forms, somewhat refuting Sven Sterken’s comments that ‘[h]is interest was not in the technically ‘correct’ translation of such models into music or architecture but in their expressive potential’ (Sterken, 2008: 34), at least in the initial case of *Evryali*. It would seem that the expressive potential can be achieved through the framing and rationalisation of the very specific, depictive ekphrastic process, and without wishing to compromise in the transmedialisation process, a title can provide a guiding metaphor for this hermeneutic reading, which in itself strengthens both formal and poetic aspects of the work. One wonders whether a parallel can be drawn between the idea of ‘successive approximation’, as stated by Helffer (who was referring to the performative aspect of *Evryali*) and this aesthetic schism between representation and abstraction through the visual-musical transmedialisation. (in Kanach 2010: 100).

3.2. Arborescence, Eco-criticism, and Bricolage in *Erikhthon*

The two ekphrastic innovations found in *Metastasis* and works such as *Evryali* find their synthesis in *Erikhthon* for piano and orchestra, described as one of Xenakis’s ‘most graphic’ scores (Harley 2004: 83), whereby Xenakis sketched the piano and orchestra parts on two different sheets. This heightened graphic aspect of the music perhaps adds rationale to Helffer’s statement that ‘Xenakis’s technique of arborescences is most highly accomplished in this work’. (in Kanach 2009). Indeed, in the preface to the score, Maurice Fleuret describes Xenakis’s process as an ‘ideal laboratory’ – pertinent to use such language of experiment when considering the concurrent exploration of arborescences in *Evryali* as a proof of concept, as suggested above. Here, like in *Evryali*, we see the role of the title and hermeneutics at play again, which bear upon a reading of the text:

I did not so much recognize the workshop diagrams as the wonderful burst of vegetal forces, in the music’s accelerated growth, the sonorous jungle in which everything flows from the irresistible thrust of nature’s sap. The piece well bears its name: ERIKHTHON means ‘The strength of the earth’. (Fleuret, 1974)

Readings that invoke this ‘natural’ aesthetic can further help to provide referential points to the depictive aspects of the arborescence transmedialisation. For example, bar 5 launches a section in the piano that centres on an A₄ pitch in a neurotic, almost out of character manner (contrasting with the initial presentation of arborescence in bars 1–4). This is the pitch to which orchestral instruments tune: it is the ‘natural’ or initial sound of the orchestra for any meaningful rehearsal or performance to be possible. The use of microtonal deviations from this pitch, in the orchestra, serve to create a dialogue between orchestra and piano that bears out in a larger sense through the use of continuous glissando vs. discrete pitch. Indeed, the division of the sketches into two parts (for piano and orchestra) further consolidates this dialogue, the realisation of which follows and modifies past musical/graphical experiments, e.g. the use of glissando in *Metastasis*, perhaps most recognisable at b. 72 of *Erikhthon*, to launch new ones, e.g. the use of breath and key sounds in the woodwinds and brass from bb.74–80 which utilise a graphic notation. It is also notable that, like *Evryali*, a metronome marking of 60bpm is used - at once allowing for co-ordination, but adding a further layer of ‘natural’ time in the matching of chronometric time units (i.e. a second).

The piece is thus experienced as the dialogue between these two sonic events, traceable not only to the depiction of arborescence form and other graphic derivatives, but to its referential understanding as a possible piece of ‘eco-criticism’: being ‘of the Earth’. This piece could be a good example of what Dimitris Exarchos describes as technical ‘bricolage’ in Xenakis’s work which ‘introduced new compositional tools, such as graphics, whereby the composer either freely composed graphic schemata, or created these via probabilistic computational processes, before transcribing them into musical ideas and notation’ (2019: 24). I would go further, however, and claim that it shows not only a technical bricolage, but a bricolage of transmedial tendencies which project beyond the technical, and begin to more explicitly consider the dramaturgy and narrative of the piece from an ekphrastic

perspective, framed by the evocative and guiding title, amidst the groundwork laid out concurrently in *Evryali*. Indeed, Exarchos relates bricolage to Benoit Gibson's (2011) study of self-borrowing in Xenakis's work, and this is a fertile area for further study with respect to the interaction of texts, particularly when considering the similarly titled ballet *Antikhthon* (1971), commissioned by Balanchine (coincidentally referenced above with respect to the choreography of *Metastasis*). This tying together of technique, poetics, and form, could give credence to Gibson's summation that in *Erikhthon*, 'Xenakis gives his imagination free reign' (2011: 43).

4. Transmedial Aesthetics

The heightened sense of ekphrastic depiction in Xenakis's works explored above – which yield both innovation and problems – creates a schism in representation: wanting to find these new forms of sound and music, but at the cost of cultural referentiality, creating what might be deemed a 'lack' in the artwork (as Derrida might argue). One could argue this would place some Xenakis's approach close to the realm of sonification in terms of a transmedial process, described by Carla Scaletti as 'a mapping of numerically represented relations in some domain under study in relations to an acoustic domain for the purposes of interpreting, understanding, or communicating relations in the domain under study' (Scaletti in Worrell (ed.), 2011: 312-313). Xenakis's highly detailed graphs, which can be said to utilise discrete data points and relationships, surely attest to this possibility of absolute depiction. However, in her somewhat polemic article, 'Sonification \neq Music', Scaletti tries to highlight the incompatibility of sonification processes with musical ones:

Sonification is not a mapping from a visualisation to sound; it's a mapping of the original source data to sound. In other words, a sonification is not a map of a map; it's a map of the territory. (Scaletti, 2019: 371-372)

Perhaps Xenakis was sympathetic with this viewpoint, particularly in the years following these initial experiments, when he claimed that '[i]ndustrial means are clean, functional, poor. The hand adds inner richness and charm.' (Xenakis, Brown, Rahn 1987, 23). The development of the UPIC system seems to be a natural embodiment of this position, and the arborescence shapes seen in *Mycanae Alpha* (1978) show the shared representational concern across media.

Xenakis's rather unique ekphrastic approach can be understood through applications of fuzzy logic: a system designed specifically to grapple with vague or imprecise statements. Like ekphrasis, this seems similarly fitting when considering the rich applications of logic within Xenakis's works such as *Herma* (1961). Unlike Classical logic, in which statements are objectively true or false, fuzzy logic allows for many-valued logics, where truth-values are interpreted as degrees of truth. Taking values $[0, 1]$, where 0 has no place in the fuzzy set, and 1 completely belongs, any value between 0 and 1 implies a degree of uncertainty. Heister has produced a mammoth (and sometimes unclear) work with respect of applying fuzzy logic to music, from the Renaissance to the present day. His introduction is particularly pertinent with respect to how ekphrasis might operate in this framework, where he states:

In the light of Fuzzy Logic, relations of music to reality, relations between various layers, between sensorial modalities, and between phases or forms of existence of music, receive new and precise contours during the musical process (2021: 3)

These 'new and precise contours' can be understood as one extreme of the transmedial spectrum, and can align with notions of sonification: a mapping of accurate relationships across data to sound (a

value as close to 1 as possible). The ‘fuzzy’ aspect of this logic should not be confused with ‘vagueness’, and Zadeh demonstrates the difference between the two:

[I]n my perception, vague and fuzzy are distinct concepts, with vagueness pertaining to insufficient specificity whereas fuzziness relates to unsharpness of boundaries. For example, “I will see you sometime,” is vague and fuzzy while “I will meet you at approximately 5 pm” is fuzzy but not vague. (Zadeh in Heister, 2021: 5)

In a transmedial, ekphrastic framework, this fuzziness is possible due to the connection put in place with the source object, e.g. architecture, arborescence, etc., and thus the process of transmedialisation will create a value between 0 and 1. It is the difference between a composition about ‘rivers’ and ‘the River Thames’, or a river’s ‘shape and contour’. Indeed, the relationship between the texts in a transmedial process, and indeed their relation to fuzziness and representation, can be usefully explained by Genette’s concept of ‘hypertextuality’ and its categories of ‘transposition’ and ‘imitation’, where the former ‘transpose[s] a style or subject into another text’, and the latter is ‘to form a hypertext precisely after the model of the hypotext’ (see Genette 1997). In the transmedial framework, imitation would fall under sonification (a truth-value closest to 1), and a transposition would constitute an ekphrasis (between 0 and 1).

Xenakis’s evasion of graphic, indeterminate scores creates a discrete set of musical data that can be analysed with respect to its suggested ekphrastic source; this is particularly true of *Metastasis*, *Erikhthon* and other works which have clear graphical sketches publicly available. From a musicologist’s perspective, much analysis is carried from the view of Nattiez’s external poetics, “[the] musicologist takes a poietic document – letters, plans, sketches – as his or her point of departure, and analyses the work in light of this information’ (1990: 141). It is these poetics that will determine the perceived truth-value of the work, and its degree of fuzziness when performing this specific reading (i.e. one centred on the relationship of the musical and graphic). A visual example might be usefully set up as follows:

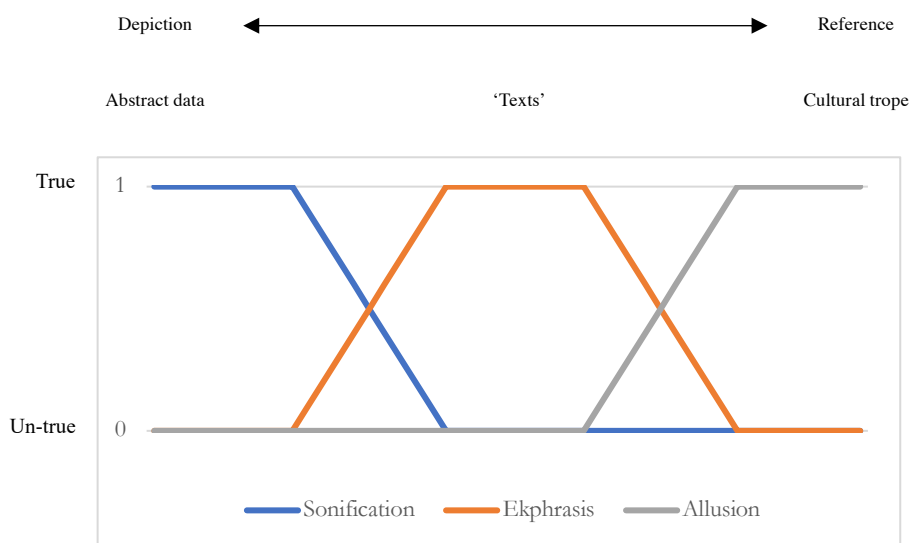


Figure 1. A visualisation of how fuzzy logic may be applied to Xenakis's transmedial music

One could argue that Xenakis’s music sits in the area between ekphrasis and sonification, in terms of

its aesthetic presentation. The position on this spectrum is largely constructed through the framing of the work itself: what it sets up, what Xenakis alludes to hermeneutically, etc. The cultural aspect of reference here is doubly interesting when considering a temporal aspect, i.e. the differing impact of a work such as *Metastasis* in 2022 vs. 1954, and how/why an aesthetic judgement may change. Arguably, one might see these different representational levels and aesthetics as Xenakis's 'internal conflict' mentioned in *Formalized Music* as the 'opposition between the sonic realization and the symbolic schema which plots its course' (1968/1992: 110) – perhaps the aesthetic implications here form a sort of 'external conflict' between depiction and reference from an ekphrastic perspective, rhyming with Nattiez's external poetics. Nattiez's fifth analytical situation could perhaps be a fruitful new direction of research for music psychologists, and would allow for these aesthetic and perceptive notions to be more empirically explored, when applied within this fuzzy framework. Anecdotal evidence highlights the impact of Xenakis's music on audiences: its 'directness', 'accessibility' etc. - and this resonates with Nattiez's listener-centric means of meaning-making:

[Music] can evoke the past by means of citations or stylistic borrowings, but it cannot narrate, cannot speak what took place in time past ... Literary narrative is an invention, a lie. Music cannot lie. The responsibility for joining character-phantoms with action-shadows lies with me, the listener, since it does not lie with music's capacities to join subject and predicate. (1990: 128)

Having said this, there is tension established with the music's agency to create meaning through a composerly criticism of an ekphrastic subject. The processes of transmedialisation, particularly in the work of Xenakis (which led to profound and meaningful contribution to techniques in contemporary music), alleviates (but does not totally remove) this 'responsibility for joining'. The intermedial aesthetic, redistributes creative agency by virtue of non-programmatic textual interaction:

[T]he arts themselves have no power to aggregate or to separate—they are neither one nor many but will gladly assume the poses of unity or diversity according to the desire of the artist or thinker (Albright, 2014: 3-4)

5. Conclusion

This returns to questioning the efficacy of applying ekphrasis to Xenakis's works. Of course, there is a limitation within this study, insofar as ekphrastic thinking (or particularly that of graphical ekphrasis) can only be appropriately applied to those works in which there exist highly visual representations (or subjects), present usually though sketches. The re-visiting of the three works with this focus, I hope, demonstrates some utility in this approach: adding new hermeneutic lenses and fields of enquiry that can stimulate further interdisciplinary or intertextual enquiry. This paper does not claim to offer concrete solutions to questions of 'meaning', rather it hopes to contribute to the esoteric field of Xenakian aesthetics: to blur, to problematise, to re-think. Xenakis positioned himself well in his commitment to intermediality, in some ways showing a similar intention to not 'answer' these encompassing questions - such would be perhaps reductive:

“The role of the musician must be this fundamental research: to find answers to phenomena we don't understand, and to enlarge our powers of conception and action. So, it is a perpetual exploration”. (Lohner & Xenakis, 1986: 54)

Interestingly, of the works discussed, it seems that the process of transmedialisation shows that these are phenomena which Xenakis *does* understand, e.g. in his applications and design of ruled surfaces

and arborescences, but his ‘perpetual exploration’ is to communicate these in a new medium. Through a more diverse situation of Xenakis’s works within the aesthetic ideas outlined herein, not only can listeners and critics hone in on a locus on meaning-making, but also composers themselves can begin to think critically on the role of transmediality. I believe this can already be seen in the effect that Xenakis had on his own students, such as Pascal Dusapin (particularly in works of the 1990s, which contain images in their prefaces),² and the renewed interest in his UPIC system and its applications.³ Indeed, the communication of the graphic aspect of many of Xenakis’s works is becoming increasingly prominent and widely available, thanks to the work of Pierre Carré and others.⁴ Thus, we can see an increasing interest in Xenakis’s intermedia, and the frameworks outlined in this paper can be useful for traversing not only the acoustic music (which has been the main focus herein), but also Xenakis’s electroacoustic and computational music.

² See *Loop* (1996), *String Quartet No. 4* (1997), *Cascando* (1997), *Piano Etudes* (1999-2002).

³ See Weibel, Brümmer, Kanach (eds.), *From Xenakis’s UPIC to Graphic Notation Today*, Berlin, Hatje Cantz Verlag, 2020.

⁴ E.g. P. Carré, ‘Pithoprakta (w/ graphical score)’, <https://www.youtube.com/watch?v=nvH2KYYJg-o> (2017)- similar examples can be found online. Indeed, one for *Evryali* exists where the final section of the video visualizes the music in a midi interface, exposing the arborescences, created by user ‘allarmunumralla’: <https://www.youtube.com/watch?v=g3qYqmOD-qU> (2012)

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