

Utopian aesthetics

Philosophical perspectives upon the work of Iannis Xenakis

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Xenakis holds a relatively peripheral position within the mainstream of scholarship on post-war composers. However, he occupied an extraordinary place in the history of music and art. Even amongst the hyper-modernist avant-gardes such as Stockhausen and Boulez, his music stands out due to its complexity and the polyvalence of his conceptual thinking, bringing together architecture, music and philosophy. On the surface at least, much of his music is seemingly rendered closed to all but those who know his prose works, notably *Formalized Music*, *Arts/Science: Alloys* and *Musique. Architecture*. His use of high mathematics and computer programs, in both electronic and acoustic music, reinforces the invisible barrier that resists a widespread interest in his music. Scholars on Xenakis are therefore few and the material available is rarely in English. However, this body of scholarship is authored by philosophers, architects, composers and computer scientists in addition to musicologists. It is reflective of the "colossal, intellectual odyssey" (Matossian 1986, 335) that his work is deemed to be as well as a homage to a man who is possibly the most multi-faceted, expansive and yet, cohesive artist of the twentieth century. The purpose of this article is to draw Xenakis into the context of the utopian genre. Previous scholarship hasn't brought much light to bear upon Xenakis' utopian impulse. It is often alluded to without explanation of how exactly utopian mechanisms function in his work. Utopianism combines formal aesthetics and artistic expression with philosophical premise and implicit politics. It is these qualities that can be traced throughout Xenakis' work.

Regarded as an almost messianic figure by connoisseurs of his music, a cult of personality surrounds Xenakis in almost prodigal reverence. He is viewed by some as providing idealistic artistic statements and solutions for humanity's ills, such as his plans for vertical utopian cities. Michael Serres' impassioned statement is a testament to the composer's reputation as innovator and visionary, "A new world, a new scientific world has emerged in the second half of the twentieth century. The first to have stated this was not a philosopher, not a scientist, not an epistemologist, but Xenakis" (in Xenakis 1985, 23). However impressive the accolades bestowed upon him, Xenakis' expressive medium remained art. The expansive nature of his formidable methodology, calling upon mathematics, science and philosophy, was only ever used as the means to the expression of his art, which he believed to have a reverential power, setting it apart from other disciplines as well as bringing them into a cohesive body of human faculty, "the revelation of beauty occurs immediately, directly, to someone ignorant of art as well as to the connoisseur. This is the strength of art and, so it seems, its superiority over the sciences" (Serres in Xenakis 1985, ix).

It is here that we find Xenakis' utopian impulse, in his broad and decisive view on the power of art. The purpose of this article is to situate Xenakis within this utopian context and explore, in general terms, how it can be traced through his work. Comprehensive outlooks on how art can be a catalyst for profound cultural change whilst providing a blueprint for new forms of existence only tend to encourage cynical responses from this side of the twentieth century. However, Xenakis displays a visionary and consistent confidence in the future that inspires a perspective within which people can believe art is not only reflective but able to actively provide new directions for humanity. For Xenakis, art's function was to, "draw towards total exaltation in which the individual mingles, losing his consciousness in a truth immediate, rare, enormous and perfect" (Xenakis 1992, 1). The Kantian language that he frequently employs mirrors the expansive and philosophical approach that is imbued in his work.

Xenakis' utopianism is wrapped up in a deeply philosophical outlook upon how the universe is expressed in art, how the individual relates to it, and how we might construct it anew. Xenakis emerged from the Second World War scarred but not disillusioned, and was determined to play his part in the rebuilding of a destroyed world. This attitude is reflected in the short-lived positivist and utopian environment of the post-war world, in which high-modernism flourished, particularly in architecture but also in music (DeKoven 2004, x). This period was defined by renewed freedom and liberalism, certainly in post-war Paris where Xenakis made his home as an assistant to Le Corbusier. Xenakis stuck with his utopian preoccupation with freedom until

his death in 2001. His work *Nuits* (1967), dedicated to political prisoners, was performed at his funeral.

Contrary to the harsh hypermodern sensibility that he is accredited with, his music, and indeed his work, is visceral and often torturous, rather than removed and "disinterested" or "unmusical", being frequent and misinformed criticisms aimed at the composer (Matossian 1986,4). This is perhaps the most fascinating aspect of Xenakis. His intense abstraction, and the seemingly escapist nature of the spectacle used in his large-scale work, leads to accusations of a modernist thinker locked in his ivory tower and struck with ideological principles that seek to alter the world with little or no engagement with its existent parts. Characterizing Xenakis as a utopian thinker might reinforce this view. However, utopianism in art is a reflection of an explicit engagement with the politics of society and culture. Xenakis, however much he employed the grandiose artistic statement, had a fundamental engagement with the individual's experience of his art. Rarely about the removal of the subject from an existent reality, his work was never intended to swamp the audience member with artistic ideology. It was intended to be a mode of engagement and reflection.

Utopianism, far from being a genre marred by escapism, is a metaphorical vision of what a better world might be. Xenakis believed that a worthwhile vision of the universe must evoke chaos as well as order (Matossian 1986, 333) and that recognition of this allows for utopia to be an active criticism of an existent reality. It is this aspect of utopianism that is articulated in Xenakis' output. In his early years his initial political engagement was as part of the Greek resistance and the communist party fighting fascism. This drive to directly influence social change in his early years transformed itself into his artistic vision upon his arrival in Paris in 1947:

For years I was tormented by guilt at having left the country for which I'd fought. I left my friends, some were in prison, others were dead. I was in debt to them and that I had to repay that debt. And I felt I had a mission. I had to do something important to regain the right to live. It wasn't just a question of music- it was something much more significant (Varga 1996, 47).

Even during this political and militaristic role during the second world war he believed the struggle to be pure and absolute, not just about the politics and survival but, "an examination of the very fundamentals of being and existence" (Matossian 1986, 22) and it is this impulse that lies at the heart of his work. Xenakis always believed, "the most important thing in art and in life, is to be free" (Matossian 1986, 335), and it was this principle, both sought and embodied, that provided his artistic vision.

Xenakis' utopian thinking and the genesis of his musical language

Formalized Music is the most significant of Xenakis' prose works. In it outlines his main theoretical and philosophical positions concerning music, art and philosophy. In the book he outlines his vision of a "universal music" that, through formalization, enabled both a model for the future as well as a way of consolidating our perception of the past. His concept of formalized music was intended to be a theory of music that would be consistent with formal logic.

[Formalized music] is [...] the effort to reduce certain sound sensation, to understand their logical causes, to dominate them, and then to use them in wanted constructions; the effort to materialize movements of thought through sounds, then to test them in compositions; the effort to understand better the pieces of the past, by searching for an underlying unit which would be identical with that of the scientific thought of our time; the effort to make "art" while "geometrizing," that is, by giving it a reasoned support less perishable than the impulse of the moment [...] – all these efforts have led to a sort of abstraction and formalization of the musical compositional act. This abstraction and formalization has found [...] fertile support in certain areas of mathematics (Xenakis 1992, ix).

In *Formalized music* Xenakis makes heavy reference to philosophical principles that he conceived in order to construct the ideological edifice that forms the conceptual foundation of his work. Much of this philosophical content is heavily based upon the Greek philosophers he so admired and connected with, Pythagoras, Parmenides and Plato. It is within his concepts of formalized and universal music that we find the underpinnings of the utopian sensibility that characterizes Xenakis. His search to establish his own artistic language was as much about his own individual voice as it was about what he saw as the universal necessity of art. Xenakis'

intention was to enable an understanding of all musical history within the context of his system (Matossian 1986, 335), achieved by the construction of a deep cosmological link between the distant past and the future, justified through mathematical axioms. Like most utopian conceptions, Xenakis' ideal was all-inclusive; utopian thought is based upon a total formalization. In this sense it is not just a model for progress, it is intended to be a way of making sense of the past, wrapped up in an all-embracing ontology that creates a conceptual nullification of history in the eyes of Xenakis (Matossian 1986, 335). The idea of a utopian modernity implies only one meaning and direction in history and therefore seems to have been deliberately invented to present a clear understanding of the transformation of art and its relationships with other spheres of collective experience.

With mathematics as tool and guide, Xenakis' intended to find an axiom that would allow the unification of all musical parameters. Broadly speaking, Xenakis' project is based upon Pythagorean ideals that would permit the unification of every element of the universe (Curd and Reeve 2005, 25). In practice Xenakis' efforts were initially done through group theory that used probability to determine musical occurrences, seen in *Akrata* (1964-65), *Nomos Alpha* (1966), *Nomos Gamma* (1967-68), and *Anaktoria* (1969), and his Sieve theory, through the study of outside-time musical structures developed in his application of stochastic processes to form musical textures that we see in his large-scale orchestral works such as *Pithroprakta* and *Metastaseis*. These musical textures provide structural dynamism and also display of a more deep-seated attitude towards his view of music as providing universal meaning in a way totally opposed to the view of music being similar to the function of language, in this way he associates aesthetics as the state of ideal communicability, a notion explored later in this article.

I do not think that any attempt to consider music like a language can be successful. The sub-structure of music is much closer to the sub-structure of space and time. Music is purer, much closer to the categories of the mind (Matossian 1980, 100).

It is Xenakis' tendency to give a broad construction to musical activity that is the most appealing and notable factor of his music. It is this expansive view of music that provides it with its sense of global significance and utopian sense of communicability as art.

Music is a matrix of ideas, of actions of energy, of mental processes, reflections in turn of the physical reality which created us and which sustains us and of our light, lucid and dark, obscure psychism. Expression of visions of the universe, of its waves, of its branchings, of its human beings just as much as the fundamental theories of theoretical physics, of abstract logic, of modern algebra... Music is the harmony of the world, but homomorphized by the domain of current thought (Xenakis 1971, 57).

Xenakis' intention was to discover whether the qualities of a sonic event could be created by variables of a logical expression. From then it would be possible to create sonic structures by performing logical operations upon the variables. The detailed account of his methodology together with the symbolized statements of the axioms and their musical equivalents is given in *Formalized Music* as well as lengthy explanations of logic and group theory. Xenakis' comprehensive and technical account is often difficult to follow, which is one reason for the frequent apathy applied to the composer. It is possible to consider the music itself outside of the exhaustive technical and theoretical justifications and adopt a more general analysis in order to gain a cohesive outlook upon the workings of each work. For Xenakis, his technical methods were always at the service of the music and were never intended to obscure its perception outside of the immediately recognizable. Xenakis never claimed that rigorous mathematical or analytical basis creates a musical work. His works are influenced and formed from his method and are not intended as, for example, literal translations of probability theory or random functions.

In *Formalized Music*, Xenakis criticized the incumbent mainstream musical methodology, that of serialism and establishes his departure from it. Criticisms of serialism were being mounted from most corners of the musical universe, no least from its most hardened post-war devotees, Stockhausen and Boulez. However, Boulez and Stockhausen both buttressed and expanded serialism to overcome the weakness of the serialist method whilst Xenakis was spearheading its abandonment. In *The Crisis of Serial Music* Xenakis charged that serial organization concentrated only on frequency, intensity and timbre and that of those three elements,

frequency was the dominating principle (Matossian 1986,96). Xenakis' main criticism of serialism was its concentration on linear formations,

Linear polyphony by its present complexity destroys itself. What one hears is no more than a heap of notes in various registers. The enormous complexity prevents the hearer from following the criss-crossing of lines and has as a macroscopic effect an irrational and fortuitous dispersal of notes across a whole range of the sound spectrum. There is consequently a contradiction between the linear polyphonic system and the heard result which is surface, mass (Matossian 1986, 96).

Xenakis made it his intention to come up with an escape route from the linear category of musical thought. It was in his orchestral works *Metastaseis* (1953-54) and *Pithroprakta* (1955-56) that Xenakis established his response to his criticisms of serialism through the creation of large structural sound masses constructed through stochastic processes.

At the beginning there were the discoveries of mass, of sounds in mass. There was a kind of vision, of explosion in my mind. Something which came as though self-evident- it was so clear and I knew it was different. Within a few weeks the idea came completely formed that I could work with strings in a completely different way, a new way (Matossian 1986, 101).

The evolution of large forms based upon the deployment of volumes and densities was an idea introduced by other composers into serial works through serialist methods. However, the mesmerizing influence of numbers often blinded composers. Mathematical operations tended to be imposed upon musical elements with little consideration that mathematical operations did not necessarily parallel genuine and perceptible musical relationships or qualities. The orderly nature of the method obscured the confusion underneath that Xenakis believed was created by an intensely linear category of musical thought. The most striking difference between Xenakis and the likes of Boulez and Stockhausen was that Xenakis concentrated upon modalities of change and dynamic processes while serial works still focused on the display of geometries or serial symmetries that he believed essentially remained static.

Xenakis' intention behind his new methodologies was to conceive of vast spatial configurations in which the individual element would not be as important as its position relative to others. In works such as *Pithroprakta* and *Metastaseis* the result is a giant dynamic tapestry where the aggregate is more than the sum of its parts, paralleled in natural phenomena such as the flights of starlings or a swarm of bees. The music is characterised by overall global shapes, sonic events and gradual evolutionary transformation with a focus upon the temporal domain. Xenakis himself suggested that his music should be seen as "a whole, as an entity" (Xenakis 1992, 156), and therefore approaching particular works in terms of spatially constructed sonic events provides a comprehensive view of the work without recourse to analysis based upon Xenakis' own complex theories. For Xenakis the sonic entity is a comprehensive way of viewing an overall musical gesture and all its complexities,

Every sonic event is perceived as a set of qualities that is modified during its life. On a primary level we perceive pitch, duration, timbre, attack- on another level we may distinguish complexities, degrees of order, variabilities, densities, homogeneities, fluctuations, thicknesses (Xenakis 1992, 157).

This large-scale treatment of sound is a characteristic that can be traced throughout his output, and one in which pitch was a sub-element of a general sonic mass created through stochastic processes and group theory. This interconnectedness between minute elements and their collective placement as part of a mass or whole can be traced throughout his work and forms a substratum of his artistic thinking. It is reflected in Xenakis' philosophical obsession with the relationship of the minute to the vast, the individual to the collective.

For Xenakis, in the Pythagorean spirit, the world was an interconnected web that could be ideally perceived as a harmonious entity. This is expressed through his obsession with the connection between science, art and philosophy, and how he felt that through an exploration of their interconnectedness in art, he could reveal a "new medium of materialization and communication" (Xenakis 1992, ix). Xenakis felt that music should embrace science and mathematics in a reciprocal relationship, "it is incumbent on music to serve as a medium for the confrontation of philosophic or scientific ideas on the being, its evolution and their appearance" (Xenakis 1992, 261). The idea that the arts and sciences should be one inseparable entity in the functioning of a good society clearly stems from the ancient Greek conception of the role of the arts and sciences and their ontological consequences for the

perfect society, explored extensively in works such as Plato's *Republic*, itself providing direct inspiration for a significant number of Xenakis' works.¹

Utopian aesthetics: Xenakis and the construction of space

Francois Choay asserts that if a critical approach is imbued in the generation of the utopian model then "constructed space is the instrument of its realization" (Sargent and Schaer 2000, 346). From then we start to speak of the conception of Utopia being inexorably tied to the creation of "space" and, as Fredric Jameson states, the engagement with politics (Jameson 2002). Alan Badiou, Jacques Ranciere and Jameson all explore the concept of a "meta-politics" expressed through art as critique of an existent reality and the subliminal power of the aesthetic in forming our reality (see Badiou 2005, and Ranciere 2009). Utopia is a constructed space in which ideological vision is presented. The word derives from the Greek *topos* ("place") and *ou* ("non") as well as *eu* ("right" or "good"). In art, Jameson argues, a political unconscious exists within the ideologies of utopian cultural artefacts (Jameson 2002, 278). Choay places much importance upon what she sees as the founding role of constructed and experienced space in the institutionalization and functioning of human societies. Plato, in "Laws" and "Critics" attributes to constructed space the equivalent stabilizing role of the Pharmakon in Greek society (Plato, Grube, Reeve 1992). Since Leon Battista Alberti etiological narratives have consistently connected both cultural identity and ontological meaning with the influence of constructed space, physical and metaphorical. Choay argues that the function of space, "rationalized and subject to geometry [...] is to ensure the equality of all the cities, to compel each citizen to occupy his own place and to play his part within the community" (Choay 2000, 347). Xenakis expresses similar sentiments in the "distribution of collectivities" in his plans for a "Cosmic City" (Kanach 2008, 138).

Space as utopian device is fundamental to Xenakis' music and architecture. Peter Hoffmann suggests the dimensions of physical space are of singular importance to Xenakis' work (Hoffmann 2001, 605-613). In the music, this manifests itself as the conception of sound masses, seen in the large-scale orchestral works but also the electro-acoustic works. This connection between physical and abstract space is displayed most clearly in the *Polytopes* with their extensive use of line and compositional density to unite musical and architectural experience in one *Gesamtkunstwerk*. Described as "spatial utopias" by Michael Gagon (Fleuret 1981, iv), they were conceived as a musical universe, incorporating an architectural shell, electro-acoustic music and mobile-light displays. Xenakis described them as marking the beginning of a new "planetary and cosmic era" (Kanach 2008, 56). The accompanying text of *Le Diatope* for the opening of Pompidou Centre in Paris in 1979 (Kanach 2008, 24), describes the cosmic phenomena that Xenakis hoped to achieve.

And when I looked up at the infinite sky, the universe contemplated me from its empty and bottomless orbit ... the universe's edifice garnished with a thousand suns, like a cavern ensconced in eternal light, where suns shine like miner's lanterns and milky ways like silver veins – Jean-Paul Richter (Kanach 2008, 67)

Similar evocations are not uncommon in the writings of a composer who described the process of composing music as analogous to navigating a "cosmic vessel sailing in the space of sound across sonic constellations and galaxies" (Xenakis 1992, 144) and explained human intelligence in the language of astrophysics (Xenakis 1985, 5). Xenakis the architect believed that the evolution of humanity had reached a "cosmic stage" and through the *Polytopes* wished to "bring the population in contact with the vast spaces of the sky and the stars" (Xenakis 2008, 159). The multimedia *Polytopes* were domains of spatial complexity articulated by sound and light in movement, "an attempt to develop a new form of art with light and sound" (Varga 1996, 112). In this sense they were paradoxically terrestrial as well as evocative of a celestial otherness, conveying nature that covered not only the earth but also the universe (Varga 1996, 112).

The first *Polytope* was the Philips Pavilion at the 1958 Brussels World Exposition, consisting of an electro-acoustic composition by Varese and a visual display by Le Corbusier entitled *Poème électronique* (Petit, 1958). The prophetic language and technical novelties of the Pavilion continued the tradition of Universal Expositions, designed as a celebration of human endeavour in the arts, sciences and technology. As well as designing the Pavilion, Xenakis also composed *Concrete PH*, a piece of *musique concrète* that introduced the main spectacle, filling the curved

spaces of the Pavilion with the sounds of burning charcoal. The title refers to the Pavilion's architecture of reinforced concrete, curved lines and hyperbolic paraboloids. Xenakis described the pavilion as architecture based upon the bending and obscuration of surfaces to create an impression of infinite form (Xenakis 2008, 123-126). The use of variable curved surfaces becomes Xenakis' artistic signature, providing the inspiration for the sculptural treatment of sound in much of his music, especially his orchestral works. The relationship between music and architecture was reciprocal for Xenakis. As well as the spatial aspects of his architecture providing inspiration for his music, compositional processes were used to influence the spectacle of the *polytopes*. For the *Polytope de Montreal*, "his total experience with musical composition was used here to serve light composition: probability, logical structures, group structures, etc." (d'Allonnes 1972, 25). The multitude of lights outlined complex surfaces, created fixed fields, clouds and long trajectories of spirals, circles or complicated curves in three dimensions. The space was constructed through rhythmic composition.

The Pavilion marks a point of departure for Xenakis, influencing his creativity for several decades, a process he describes in the blueprint for the *Polytopes* (Kanach 2008, 148). This technological art form was to bring together the concept of abstract painting with the techniques of cinema, combining coloured mobile backgrounds, shifting spatial configurations of patterns and forms, and abstract music. According to Xenakis, the process of musical "abstraction" consists of the appropriation of concrete sounds and electronic sonorities into vast sonic gestures (Xenakis 2008, 146). In the *geste électronique total*, spatial locations as well as pitches, durations, timbres and dynamic levels are inherent to the structure. It is within the *Polytopes* that the most explicit connection between architecture and music, physical and sonic space, move to the forefront of Xenakis' work.

The spatial conceptions of sonic entities are thematically central in Xenakis. James Harley posits that many of Xenakis' orchestral works function on this level (Harley 2004, 57). Peter Hoffmann focuses exclusively on an analysis of the spatial aspects in Xenakis' instrumental works (Hoffmann 1998,146). For all its perceived complexity, Xenakis' music most obviously functions by means of sonic events and large-scale gestures, derived from minute elements. Although Xenakis' music is often extremely elaborate in detail, it is always at the service of the whole, evident in his orchestral music as well as much of his electro-acoustic music, for example in the creation of compositional algorithms ST (Free Stochastic Music) and GENDYN (Dynamic Stochastic Synthesis) (Hoffmann 2001, 605-613). Form rarely emerges from the development of thematic cells but from the collage-like succession of superimposition of segments that display strong internal connections. In contrast to the post-war serialists, pitch is often a sub-element of a general sonic entity. The proportions of the parts and the ebb and flow of tension in a work are often determined with what Hoffmann regards as Xenakis', "infallible instinct for musical dramaturgy". Much of Xenakis' work therefore functions at a level of perception that is akin to our experience of architectural form. Harley supports this, arguing that it is possible to focus on the "aesthetic" or perceptual aspects of the music as sonic events. Xenakis himself states,

most musical analysis and construction may be based on 1) the study of an entity, the sonic event [...] which possesses a structure outside time; 2) the study of another simpler entity, time, which possesses a temporal structure, and 3) the correspondence between the structure outside time and the temporal structure: the structure in-time (Kanach 1992, 160).

A key element of Xenakis' gestural language was his use of glissandi. Miha Iliescu argues that glissandi, like sound masses, illustrate underlying morphological unity between music, architecture and mathematics (Iliescu 2001). The idea of the sonic shape, a kind of sonic *gestalt* analogous to visible architectural lines was what Xenakis felt created musical universality "founded, guided, directed by and towards the shapes and the architectural design" (Xenakis 1978, 159-162). The glissandi give sonic appearance to concave and convex surfaces. In *Metastaseis* the sound mass is constructed through complex glissando textures and massive vertical sonorities, the glissando develops spatially by moving from one instrument to the next while the pitch gradually modifies. Xenakis' expression of spatial sonorities through line is concentrated on his writing for strings. However in *Terretekhtorh* (1966), *Nomos Gamma* (1968) and *Synaphai* (1969) Xenakis develops wind sonorities along the same lines with microtones, glissandi, detuned unisons and quilisma.² In *Terretekhtorh* the instrumentalists are also placed throughout the audience, as the piece unfolds and builds from individual sonorities to the entire ensemble the music defines a spatially conceived sonic

environment. A similar principle is displayed in *Empreintes* (1975) the opening pitch is sustained through out the first half, gradually fanning out by means of a full orchestral *tutti* glissandi towards the end of the piece.

Xenakis' emphasis upon the spatial properties of sound in composition finds precedent in the writings of Pierre Schaefer, the pioneer of *musique concrète* who, in the early 1950s, introduced the idea of the movement of sound along *trajectoires sonores* (sonic trajectories). This term refers to imaginary paths traced by mobile sound images that emanate from static loudspeakers and travel around a performance space. Schaeffer utilized two types of spatial sound projection with multiple loudspeaker systems: "static relief" and "kinematic relief", the latter involving mobile sound sources whose movement was controlled by hand gestures of the performers. This creation of "spatial relief" can be found in Schaeffer and Pierre Henry's 1951 works in Paris, when *Symphonie pour un homme seul* and *Orphée 51* were performed (Vande Gorne 1988, 8-15; see also Palombini 1993). Xenakis reformulated these concepts as *stéréophonie statique* (sound emanating from numerous points dispersed in space) and *stéréophonie cinématique* (sound whose sources were both multiple and mobile). Here, Xenakis imagined that by the precise definition of sound source locations, geometric shapes and surfaces might be projected into the area of performance. These geometric sound entities arise from the succession and simultaneity of sound images played back from loudspeakers located in the auditorium. If, for instance, the same sonority was performed in succession and with a slight overlap from several loudspeakers, it would create a triangular sound pattern. If many short impulses were heard, they could, depending on their placement in time and space, create sonic surfaces. One can multiply these examples to demonstrate how an auditory space could be structured by means of abstract morphological principles. Xenakis' use of the language of geometry to discuss aural phenomena has parallels in contemporaneous literature of the avant-garde (Ligeti 1965; Kagel 1965 & Rochberg 1963).

In his *Polytopes*, Xenakis conceived "energetic models of space" (Oswalt 2001, 211). The idea is that space defined by physical enclosures is "static, closed and homogenous" (Oswalt 2001, 211). In contrast, Xenakis composed space through light and sound within architectural shells consisting of curved boundaries to convey infinity seen in the *Polytope de Montreal* (1967), an "electronic sculpture combining light, music and structures" (Xenakis 2008, 199). Through the curvature of the frame the space becomes three-dimensional, generating the illusion of depth and infinity. Within this shell Xenakis used abstract light compositions, dissolving the physical space into a multitude of gestural reference points of varying densities. This was achieved through the fastening of thousands of light bulbs onto a web of steel cables that enclosed the audience in one enormous hyperbolic paraboloid, an architectural shape that is reflected in the construction of the glissandi in *Metastaseis*. Indeed the use of rhythmic density and mass phenomena is illustrative of the connection between Xenakis' architecture and his compositional methods. Xenakis created for the first time an architectural space defined by abstract densities, "the space becomes an energy field, a cloud of luminous and acoustic events of varying intensities" (Oswalt 2001, 212). The arrangement of space was therefore conceived as alternating rhythmic forces, not through strict Cartesian demarcation, creating perceptions of immensity. The space does not force its dimensions upon the individual but emerged out of its sensory relationship with the perceiver in terms of its presentation of infinite forms.

Kant and the aesthetic construction of utopia

The experience of a utopian space is the aesthetic equivalent of breathing a new consciousness that, in the Kantian sense, transforms into a collective understanding of the encompassing universe. It is the communicability between the aesthetic and the conscious that is integral to the utopian concept, reflected in Xenakis' conception of a formalized aesthetic in *Formalized Music* and mirrored by the collective experience of spectacle seen in the *Polytopes*. As seen in the previous section the connection of temporality with spatial concepts play a significant part in Xenakis' work. Xenakis' architecture was frequently defined through rhythm and the music through architectural principles. In *Formalized Music* Xenakis develops Jean Piaget's conception of the perception of time being inseparable from space and its subsequent role in the notion of universal and collective experience in art (Kanach 1992, 27). Hegel's concept of *Geist* (spirit) points us towards something of the philosophical process that is a function and spectacle of the utopian space, that of the formation of consciousness.

In that a self-consciousness is the object, it is just as much "I" as it is object - And with this we already have the concept of Spirit (geist) before us. And what consciousness has further to become aware of is the experience of what spirit is, this absolute substance which, in the complete freedom and independence of their opposition - that is to say, different for themselves-existing-consciousness is the unity (einheit) of these same opposites; an "I" that is a "We" and a "We" that is an "I". Consciousness first finds in self-consciousness, as the conception of spirit, its turning point (wendepunkt) (Hegel in Kainz 1983, 106).

Hegel's understanding of the formation of consciousness is an understanding of the universe in terms of the dialectic between the "I" and the "non-I". For the utopian medium, the construction of the "I" (consciousness) is fundamental as it is the first step towards the collective self-consciousness of "We". The relation of "I" to "We" is integral to the universal functioning of utopianism, achieved primarily through the function of the aesthetic level of the utopian form. As Kant argues, it is the power of sensibility that forms the central aspect of how utopianism functions, the experience of a utopian aesthetics is the first step to forming a conscious identification of "I" (and therefore "we") within the utopian space. It is the construction of aesthetic experience, and how aesthetic experience has an effect not only upon one's self-consciousness but also the form of one's self-consciousness, that forms the language of utopianism and our relationship with the collective aesthetic consciousness. This intensely formalist characteristic lends utopia its enduring power as an art-form, and the reason why the notion of "universality" is such an integral part of utopianism. It is this aesthetic universality that is so inherent in the work of Xenakis. Kant's argument on the universality of aesthetic judgment is useful in assessing how aesthetics are key to the construction of utopia and its communication as a spatial conceived and collective aesthetic experience.

In the *Analytic of the Beautiful* (Kant 1995) Kant focuses on aesthetic experience. His argument that the grounds of such aesthetic judgments lie in the experience of subjective but collective harmony in the presence of an object is central to his aesthetic judgment. In addition, the key to such experience lies in the mutually compatible functioning of all human faculties that are common to all. The underlying element of such aesthetic experience therefore becomes the full exercise of all of our sensory, cognitive and emotional capacities. The unity and completeness of aesthetic experience within the formation of a collective consciousness is integral to the utopian project and echoes Kant's view that the communicable, i.e. universal, aspects of aesthetic formalism permit for a subjective universal validity. Thus allowing a location of the Hegelian "I" in "We" and vice-versa within the collective consciousness that is a fundamental of the utopian venture.

Utopian space is non-representational and non-symbolic, its primary mechanism being the aesthetic level upon which it functions. It is the communicable essence of aesthetics that allows for its universality. This is grounded in the creation of a collective consciousness so that any universal statement becomes a universal qualifier, this being the fundamental of the aesthetic experience in the eyes of Kant. Kant's arguments about the nature of aesthetic judgment aim to explain how aesthetics function upon a certain level of quantifiable inter-subjective agreement that allows for universality. For Kant, judgments of beauty are "the one and only disinterested and free delight" (Neill and Ridley 1995, 271), and this is essential to their inter-subjective validity. For Kant this is what makes the function of aesthetics a function of cognitive freedom. Aesthetic experience involves a general and free cognitive contemplation. This freedom makes universality possible, because, "no personal conditions to which his own subjective self might alone be party" (Neill and Ridley 1995, 275). The shared element that allows for subjective universal validity is the general relationship between the two cognitive faculties of imagination, "the passive and the active faculty" (Crawford 2005, 52) of producing thoughts, thereby unifying what is received by the imagination into a singular aesthetic experience. Aesthetic experience is possible because "the imagination has the maximum possible freedom from the constraints of the understanding consistent with the object's being perceived, and the understanding has the maximum possible freedom with respect to what is presented to it by the imagination" (Budd 1995, 30).

The communicability of aesthetics is possible because the cognitive faculties are present in everyone. Kant's assertion of the subjective universal validity of aesthetics means that although aesthetic judgments are subjective, we are all able to feel a response to aesthetic stimuli. By virtue of some aspect of the human mind, we agree upon judgments of beauty, and so they are universally valid, yet subjective. Aesthetic judgment is therefore universally shared

among humans. Kant's argument is that it is not fixed judgments of aesthetic beauty that create formalized collective experience, rather it is the ability to respond to aesthetic stimuli that creates the collective consciousness that is fundamental to the utopian project. It is not necessary to think of this conflation of individual and collective time in terms of any eclipse of subjectivity, nor as a transcendence of individualism, this being the main anti-utopian stance. As already stated the recognition of "I" as a "we" is reflective of the relationship between our different cognitive faculties that enable sensibility. In one respect this does allow for a unity of consciousness resembling a single experiencing individual, yet at the same time there is a distinction between subjects. In terms of the aesthetic experience of a spatial utopia, there is a single communal "I" as well as a manifold and variegated "us". We can express ourselves as individuals by responding to the aesthetic expression of utopia. We are bound together in the "cosmos" by the very aspect of our presence. This was exactly the theme of the 1967 World Exposition in Montreal, for which Xenakis was responsible for the French Pavilion. The general theme was *Terre des Hommes* (Man and his World), encompassing a number of subjects, all celebrating human achievements in controlling and transforming the earth (*Terre des Hommes/Man and his World, Expo 67 program*). The organizers hoped that, in addition to revealing a tremendous faith in progress, the exhibition would also express human solidarity on Earth, "this one tiny speck in the vastness of the universe". Xenakis intended his installation to present the "reflection of infinity which is our universe" (*Expo 67 program*) under which humanity could reflect on its unity. Kant's view of the universality of aesthetic judgment guides us through the notion that it is aesthetics that make utopia communicable, and how its universal formalism functions as the individual's relation to the Utopian project as part of a collective consciousness.

On a cognitive level, part of the importance of "space" within the philosophy of Utopia is that the mind is given new conceptual paradigms from which new forms of thought emerge. From a cognitive viewing point, the non-place is a transcendent form. Lacking fixed representative definitions associated with "place", knowledge is not acquired from symbolic determinisms but left to create its own universe in the eye of the beholder. The concept of utopian space is the creation of a corner of the world that we can possess. Free of uncontrollable and exterior definitions of what our space is, it is our motionless universe and forms something resembling our own cosmos. George Bachelard in *Poetics of Space* (1994), associates similar characteristics with our perception of private dwellings and how they are imbued with meaning and representation of our own freedom. Utopia is married to an abstract idea of freedom and ideological programming, be it ethical, social or concerning a cultural aesthetic. Part of the "free" nature of utopia is this sense that the imagination is left to augment the pre-existing values of reality into something akin to fantasy. The paradox is that the path to this freedom lies within immovable cognitive paradigms. The fantastical element becomes nothing more than a tool of conscious removal, intended to set alternative, or newly released, modes of understanding (namely aesthetic) as the first step towards freedom. Utopia is characterized, in fact can only exist, by and within a comprehensive formalism encompassing unprecedented freedom and rigorous normalization. The idea of equality, and therefore freedom, stemming from a collective consciousness resulting from rigid formalism is the utopian paradox.

The political question comes to the surface, even without any explicit expression. As Jacques Ranciere argues, "Aesthetic acts are configurations of experience that create new modes of sense perception and induce novel forms of political subjectivity" (Ranciere 2010, 9). Utopia is a spatial genre within which the aesthetic construction of consciousness and understanding forms a reciprocal relationship between the individual as subject and the collective spectacle of the artwork. Conceived as a tool of discriminating the authentic from the inauthentic, between true and false desire, utopia is an illusory form. Deleuze points out its credibility as a manipulative cultural tool stems from our inclination to believe in illusion rather than truth in the first place (Deleuze 1985, 31). Utopia is thus conceived as an aesthetic, which is how it achieves its communicability in art, architecture and music. In spatial terms, the artistic utopian program or realization involves a commitment to closure as part of a formalized and uncompromised existence. As Roland Barthes observed of the Marquis de Sade's utopianism, "here as elsewhere it is closure which enables the existence of a system, which is to say, of the imagination" (Barthes 1971, 23). It is here that we find utopia's political will, in its ability to manipulate the imagination and consciousness of the individual subject through its aesthetic construction.

In conclusion: Xenakis, utopia, music and politics

Utopia has always been a political issue. As a place of ideological politics realized as visionary art and literature, its power as cultural tool lies in its symbiotic combination of art and politics. Any trace of a utopian impulse can be immediately characterized as an implicit critique of existing social and cultural structures. It is the presentation of radical and uncompromising goals that points to the antithesis of a given reality. The relationship between utopia and the political, as well as questions about the practical-political value of utopian thinking and the identification between socialism and utopia, continue to be unresolved topics today. In the same way that the political status of the form is subject to permanent doubt, its artistic function is also structurally ambiguous. It is a word whose definitional capabilities have been completely devoured by its connotative properties. Sometimes it refers to the delusions that lead to totalitarian catastrophe and sometimes it refers, conversely, to the infinite expansion of the field of possibility. Even with this in consideration, there is no question that it is utopia's dualistic capacity of political ideology embedded in aesthetic language that provides it with its alluring power.

Xenakis can be readily placed within the utopian project, his aim was unification of seemingly disparate artistic elements and, by transcending them, his hope was to render them universal (Kanach 2008, 45). Xenakis had a fervent belief in art's capacity to change the world around him, and located in music an ability to anticipate wider historical developments, "the music of tomorrow will become a tool to change man, by influencing the structure of his thinking" (Varga 1996, 126). It is exactly this that Jacques Attali argues is the ultimately political role of music (Attali 1985). Attali's argument however differs from Xenakis' in terms of how exactly explicit political will manifests itself in music. Attali argues that for all its historical "anticipatory" power, music was still essentially a reflective medium. In contrast Xenakis maintains a belief that art's role is catalytic. When considering Xenakis' utopian impulse it is instructive to consider how far he placed himself at the centre of history in terms of his belief in the power to influence it, as we have seen in his *Formalized Music* (see Section 1). Xenakis is a figure that stands in opposition to Boris Pasternak's view that, "No-one makes history, we do not see it, any more than we see the grass grow" (Josipovici 2011, X). His artistic vision, in both architecture and music, was all encapsulating and uncompromising and representative of a true utopian spirit engaged with the fundamentals of how we relate to the world around us.

For the greater part of the twentieth century utopia became a synonym for Stalinism and betrayed a will to uniformity and the ideal purity of a perfect system that had to be imposed by force upon its imperfect and reluctant subjects. In a development that relates to Xenakis' own utopian impulse, Fredric Jameson cites Boris Groys as identifying the domination of political will over matter with the imperatives of aesthetic modernism (Jameson 2005, xi). Jameson, however, points out that the older Marxist traditions, drawing upon Marx and Engels' historical analyses of Utopian socialism in *The Communist Manifesto* (Marx and Engels 2010 and Engels 1970), denounce the Utopian ideal as lacking any conception of agency or political strategy and characterize Utopianism as idealism profoundly and structurally averse to the explicitly political (Jameson 2005, xi). At this point, if we consider that utopia has no explicit political value, then we have to assess Utopia's worth as an implicit political message. Attali, however, argues that music is an immaterial political force, "listening to music is listening to all noise, realizing that its appropriation and control is a reflection of power, that it is essentially political" (Attali 1985, 6). This is exactly the quality that Jameson locates with the utopian genre. However, focusing on what the implicit or explicit political message is in utopian thinking is often obscured by a frequent lack of coherency between the genre's dual influences of social ideology and modernist formalism.

Attali establishes the conceptual possibility of the political will and utopian impulse he sees embedded in music, "[music] is at the heart of the progressive rationalization of aesthetics, and it is a refuge for residual irrationality" (Attali 1985, 6). This dualism characterizes utopia. On one hand it is the site of rigid formalism, a serious alternative vision of society. On the other it is a poetic and idealistic criticism, irrational in its impossibility. In music the aesthetic power of the unreal is paralleled in the fantastical quality of utopian thought, "when it becomes sound, noise is the source of purpose and power, of the dream-Music" (Attali 1985, 6). It is therefore within music's utopian impulse that we find its implicit politics and utopia's "magical" quality, sustained by its fantastical foundations.

Xenakis' frequent involvement in World Expositions is reflective of the Utopian essence that is imbued in his work. World Expos focus upon an idealistic vision of the future where humanity solves its ills through notions of scientific progress paralleled in social progress. Bringing rationality to bear upon historical time as progression towards some final and perfect goal is part of utopia's grand narrative. Utopia is a final act that allows for an endowment of history with transcendence, under the insignia of progress and reason. The rationalized conceptualization of time and history points towards utopian thought placed at the end of rational discourse, a final destination of history governed by meaning, necessity and transformation. It is within utopia as a prognostic genre we can place Xenakis, expressed in the new "planetary and cosmic era" (Xenakis 1992, 7) by which he located the ideal future in the present when the planet would be a "World State" (Xenakis 1992, 139).

From his move to Paris, Xenakis appears to expunge overt political stances in favour of aesthetic and cognitive idealism, "If countries economies' were not tortured by strategic and armament needs - in other words, on the day when the nation's armies would diminish into simple, non-repressive police forces - then financially, art could fly over the planet and soar into the cosmos" (Xenakis 1985, 7). These views provide a profound insight into the way Xenakis saw his role as an artist in the twentieth century. Even during his more active political and militaristic role during the second world war, he believed the struggle to be pure and absolute, not just about the politics and survival but an examination of the very fundamentals of being and existence (Matossian 1986, 22). "There is no reason why art cannot [...] rise from the immensity of the cosmos; nor why art cannot, as a cosmic landscaper, modify the demeanor of the galaxies" (Xenakis 1985, 5). The scale of Xenakis' intentions is made clear in his original proposal for the spectacle accompanying the opening of the Pompidou centre in Paris. He states that the time had come to "bridge the arts across oceans, between continents and among countries [...] why not weave together the population of the earth through the arts, by establishing a new, direct contact that overcomes the barriers of language, politics, parochialism, racism, chauvinism?" (Xenakis 2008, 254). Xenakis persists with the idea of the collectivity in art and upholds Marx's view of "art as the transformation of thought into the sensory experience of the community" (Ranciere 2010, 44). The sheer power he attributes art as a means of solving social and political issues is a breathtaking statement of philosophical intent.

Certainly some of his conceptions of physical Utopias (such as the cosmic city) are difficult to take seriously, being as they are fantastical statements about what a futuristic physical utopia might look like, let alone be. In particular Xenakis' view of the division of labour in his "Cosmic City" (blue collar workers mixed with white collar workers) as an expression of social utopia doesn't stand up to much scrutiny due to its simplistic nature. Xenakis' body of prose works that convey his world view have come under criticism. "Xenakis has something to say. Let him say it, but in music. Not by getting himself drunk on pseudo-philosophic jargon" (Matossian 1986, 178). However, it is worth bearing in mind that it is utopia's vocation to enunciate unformable or insoluble problems. At best his utopian impulse is contained within his *Polytopes* and his music, remaining a highly sophisticated expression of Xenakis' political, philosophical and artistic outlook. Obviously, the unrealistic nature of utopia is an integral part of how the medium functions. However, different artists and writers have approached it with varying degrees of sophistication and success in terms of making sure it remains a fictional genre, while still providing some sort of social and philosophical critique of an existent reality. In the case of Xenakis, his utopian impulse feels, at times, to be bearing too close to an optimistic view of the potential for change, especially in his prose, rather than keeping it within his artistic conceptions in which the power of his utopian impulse is so successfully expressed.

As with any utopianism, Xenakis' outlook can be seen as is flawed. However, it is a constant distraction that the book-bound nature of utopian solutions can be seen as depriving them of any value, of any social and political effectiveness. The argument against this is that it is precisely in the fantastical and unrealistic nature of utopia that we find its intrinsic worth. Utopia is an abstraction from reality, a way of placing ourselves in relief in so that we can see ourselves in a clearer light. There are many different forms of Utopia in various manifestations in art, literature and political ideology. Utopian thinking is easily attacked as being symbiotic with totalitarianism, and art has too often been the tool to express cultural ideology. Xenakis' conception of utopia is more about freedom, and art's capacity to instill and reflect that freedom. For Xenakis, far from being the instrument of a manipulative and policing power, as

Foucault suggests (in Sargent and Schaer 2000, 348), utopia as an artistic device designates, by awarding itself the transcendental power of the law, its very erasure. In Xenakis it becomes an instrument serving to promote the freedom of the individual and art, for Xenakis, is inherently about freedom, expressed or created.

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Notes

¹ Notably the "The Myth of Er", from the end of the tenth book of the Republic, accompanies Xenakis' *Diatope*.

² *Quillisma* are sustained notes which are destabilized by means of slow irregular pitch oscillations around the given notes, at times leading to other pitches as part of a linear contour.