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*University of Athens – Iannis Xenakis Symposium - 2005*

The musical originality of Iannis Xenakis during the schematization process of the European postwar avantgarde after WW II was mainly determined only by himself as a result of the transcendental courage of his spirit. Altruism and a brilliant transgression of conventions in his music caused rough exposed water in the sea of musical traditions and the musical innovators of his season with a way which declared an exigent brain exercise and the reactivation of the ancient greek encyclopaedic way of thinking via means of an ultramodern rationalised and simultaneously structured primeval sound vivification. The sunrise of west musical thought after the 2nd WW started through the endeavours of this duellist, who was also able to estimate and take control of new sound-situations. Was the mysterious Iannis Xenakis an heretic or a Titan who gave a hard fight to awake to the indifferent collective unconscious valuable information of a paradise lost which stays in relation with the survival of humanity? Envisioning an interconnection with the ancient virtue of the unification of spirit and body Iannis Xenakis was an athletic figure that incarnated contest and spirituality. He is undoubtedly one of the personalities who with his limpid thought determined the development of the 20th century music

### Delphic announcements and musical divinations in Iannis Xenakis sound ichnography.

One trying to understand the communicative structure of oracles in antiquity in many occasions stays astonished from the abstractive condensation or of the way of the structure of the sound formations in the recitations of oracles and the so called *χρησμοδιών*. (Prophecies that were announced through a song or certain concrete verses). Oracle body-motions, oracle-neumes or oracle non-verbal signs did not constitute a definite result after the sinking of sibyl in space-time continuum. In this state she prophesied. She spoke in riddles, which in most cases were interpreted by the priests of the temple. In most cases, as we already know, the matter was after about how to decipher irrational wording or provisions of words and sounds or even more patterns of non verbal signs. Mostly it was necessary to be reinterpreted, rehashed and converted through translation from experienced interpreters.

These expert transliterators were able to transfer the imaginary sound-word schemes to a more compatible language convention which was in accordance with the conceptual conditions of the times that the Trance-formations, took place. The interpreters could translate the meaning of a revelation but could not say its prediction would turn out to be true<sup>1</sup>. Through this procedure was possible to interpret imagination and visualization and to focus on foreseeing needs from probabilities of correlations.

Sometimes however it happened that the sound-words remained untranslated as a frozen audio-visual information. This mainly happened because the apparent irrational language of oracles or the verbal and sound content of oracle-songs were connected with different forms of symbolic expression such as natural phenomena of earthquake roar - bang of thunder - sound of the wind, birds flying in formation.

They were not necessary encrypted, but were chaotic. It was impossible being interpreted from persons living in a very specific space – time frame who they had not developed a global understanding and feeling of the various possibilities of sound perplexity and its possible transformations of abstract sound symbolic representations or morphosyntactic forms<sup>2</sup>. More than this, it was difficult for someone to comprehend the degree of influences of these sounds on the human brain and in relation to what we call multiple intelligence, spatial dimensionality and mythological time.

In Greek temples the travel of the mind through sound was not a simple helping tool to transcend the space-time continuum but literally the interconnection via the vibrations of sounds and soundflows towards different time-sequences of which the behavior many times was unanticipated<sup>3</sup>.

According to the Timaeus it is the task of the *προφήτης* to provide a rational account of the, at first, incomprehensible meaning of what is uttered in a state of trance by the seer.

In other words the dynamic process in which this sequences behaviour was created, was erratic and it was not depending in concrete rules. The matter of understanding and foreseeing its development was of course complicated.

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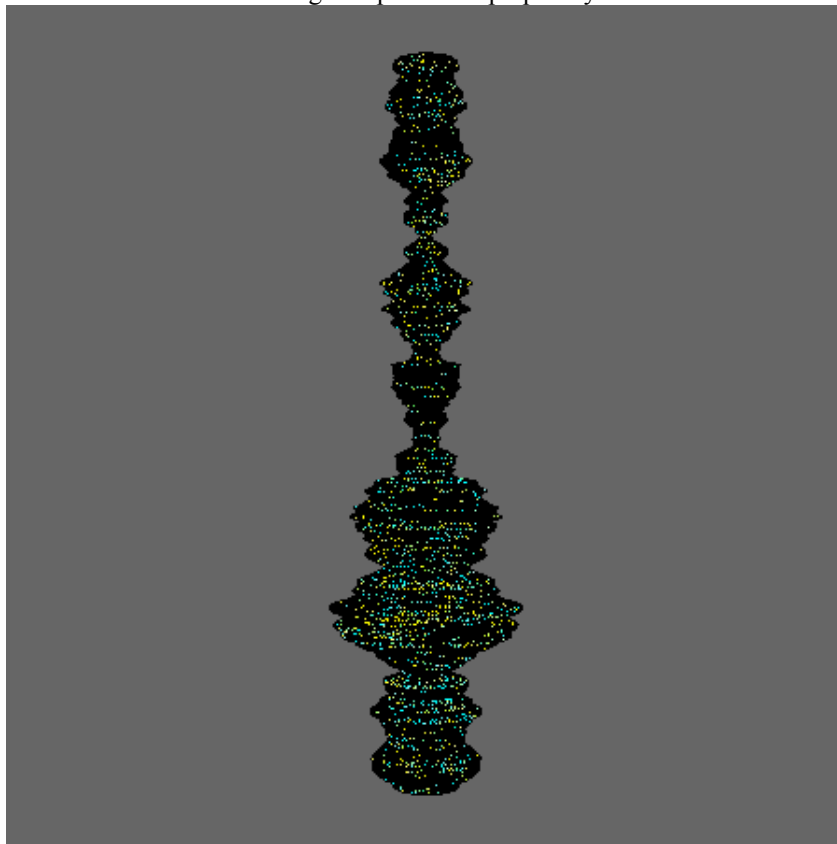
[1] CF: Hermeneia und Hermeneutik: *Ursprung und Sinn der Hermeneutik*, in K. Kerényi, Griechische Grundbegriffe, Zürich Rein-Verlag 1964

[2] CF: Bouché-Leclercq, A., *Histoire de la divination dans l'antiquité*, 4 volumes, Paris, 1879-82;

[3] CF: Abrabanel, H. D. I, R. Brown, J.J. Sidorowich, and L.S. Tsimiring, *Analysis of observed Chaotic Data in physical Systems, Reviews of Modern Physics*, 65 (4):1331-1392, 1993

It had escaped from the particular time -sequence of its locality and had travelled with the help of the mind - body biological field of intermediary to irregular directions and had returned back to a specific space-time as a verbal - sound or other sound condensation with a useful sum of information. This small amount of information, was enough to describe incidents or situations via verbal-sound or kinetic energy or non- verbal symbolisms.

Xenakis gives us through his own original texts enough information about the way he conceived music and its relation with the space -time question. Through his written authentic observations it becomes to us known that he had a deep knowledge of the different systems of ancient greek philosophy and art. In particular, Xenakis refers to the disposition of musical structures and their relation to the architectural structure and behavior of the human brain. Especially he makes reference to the numerical and geometrical dispositions of sounds and their synergetic combinations<sup>4</sup> in connection with nature and historical continuity. The sound sequences, the rich way of their grouping and regrouping and the dynamic row of impressions that they can transmit to us, are mentioning the new mission of music, also. To build original time architectures. In his essay *About Time*<sup>5</sup>, Xenakis recognizes the space-time continuum as a unique all. Recognizes the diversity in the perception of time depending on the human brains and the evolutionary character of reality. Thus every new effort of sound distribution and organization by Xenakis world was meant for a new beginning towards inventive formations of beings in space-time perplexity.



According to the general principle of relativity, the space-time continuum cannot be regarded as an Euclidean one. Above you can see a Model of a space-time moment transformation in computer simulation. It portrays only one from the multiple universe transformations within a dimension of space-time. It concerns a visualization of a simulation of a model of 2-d Lorentzian Quantum Gravity. Somewhat surprisingly, this leads to a well-defined continuum theory.

Its structure has been measured in centimeters of a second.

The simulation was made by Jan Ambjorn, Mr K.N. Anagnostopoulos and R. Loll.

The constellation of new musical entities through reassembling of different mathematic formulas as the Gauss-formula or the logistic formula of Caussi for casual speeds-distribution includes a timeless intelligible election of value within the space of the real tones. Xenakis used also causality as a tool of differentiation. However it is interesting that the combination of different mathematic formulas builds each time a creative choice by the creation of one new unique universe. An effort which tries to express unanticipated events and facilitates the intercommunication of different sound worlds through melting<sup>6</sup>. Thus Iannis Xenakis also mentions apart from the fusion of analog and transformed digital

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[4] CF: Haken, H. *Erfolgsgeheimnisse der Natur. Synergetik - Die Lehre vom Zusammenwirken.* Stuttgart: Deutsche Verlags-Anstalt, 1981.

[5] Iannis Xenakis: *About Time 1988* ,in: Texts about music and Architecture Athens 2001

[6] Iannis Xenakis: *Sound Universes,* in Texts about music and Architecture Athens 2001

sounds of computers the possibility of coexistence of different forms and notions that are registered in the human genetic codes. Was this brave Xenakian concept, a motivated sound illumination for the awakening of certain lost information in collective unconscious? An illumination not only of the brain but also of the body through the sound bombardment of the existed air in the fluids of human corpora? Sudden increases in electromagnetic radiation or sound waves in the environment can cause sudden inner changes if the intracellular electrolytes are decreased (like in aging) in all the cell of the body. What effect has the speed and time structure of sound to our blood?

Xenakis used a systematization of time distribution in his musical material. It was achieved by different types of hierarchy

1.direct micrologic 2.indirect micrological 3.macrologic interrelations of musical segments of different length<sup>7</sup>. We discover it in some of his early works (p.h.Morsima-Amorsima) in which the composer has not abandoned the methods of serialism while later it passes in obscure organisations by the use of accumulated abstractions above other abstractions or time bindings of different sound surfaces creating abstractions through two-dimensional multiplicities. Methodical utilisation of sound masses and accidental fluctuations in the possessed continuous way of the approach of tone-distances with upwards and downward movements (Glissandi) designed as straight lines. Methodical formulas are applications of Poisson - Maxwell Boltzmann - Gauss in relation to a new possible ontogenesis.<sup>8</sup>

Perfectly different is also the private<sup>9</sup> path (*Das Anrennen gegen die Grenze der Sprache als Ästhetischer Akt*) that Xenakis follows in contrary to the approach of Schnebel, Kagel and Ligeti by the amalgamation of vowels and consonants of foreign linguistic types with the characteristics of Greek phonemes<sup>10</sup>. This occurs in the works N'Schima, Akanthos, Nuits and Ais. This approach moves towards a recreational enlightening<sup>11</sup> of previous information from something authentically experienced trying to stir up, reform and overcome a past situation through language incarnations<sup>12</sup>.

The concept refounds a readjustment of linguistic fusions targeting to a successful molecular survival<sup>13</sup> for the future. By this way matter retain knowledge through its Form. The dramaturgy of these works is located in the transmission of living experience and also to a recorded warning about an already experienced destruction. (When people recall information composed of sights and sounds, neural activity surges in some visual and acoustic areas of their brains just as it does when they first formed the memory. [See two teams report in the Sept. 26 *Proceedings of the National Academy of Sciences*. These particular brain regions handle sensory information only after it has passed through the separate neural gateways for sight and sound. Parts of the frontal brain, already thought to coordinate memory retrieval, recruit these secondary sensory areas to help assemble memories.<sup>14</sup>See also Brentano's induction theories and Helmholtz *vowels general truth*].

Even though to Iannis Xenakis hovered over him threateningly the accuse that his art was product of a non - social indifferent technical fall back, in a strange way, he was one of the very few postwar composers who had passed the transient stage<sup>15</sup> as Norbert Wiener describes it. This stage has overcome the study of relation between [human - God and matter] and investigates the relation between [human spirit<sup>16</sup> and its artificial reproduction<sup>17</sup>]. May be this courageous step forward, was the reason that Xenakis, was characterized as heretic. A step to the unknown crossings of forbidden knowledge, which in our days begins to expand at whirlwind speed via the technological evolution and its interactions. Indeed, the pioneering thought of Iannis Xenakis, in relation to his era, caused, if that was not anxiety, at least a curious rapid withdrawal from the familiar and well known music environments. The influence of his thought was and still remains an open offence against the music conventions which reproduce a style attached in fashion, a style of homogeneous genetic types and codes.

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[7] EUT. Böttinger, Peter: *Zeitgestaltung*. Die kompositorische Bewältigungen rhythmischer und formaler Probleme im Werk von Iannis Xenakis, in Musik Konzepte 54/55-Iannis Xenakis-Hrsg. Heinz Klaus Metzger und Rainer Riehn, Mainz 1987

[8] Iannis Xenakis: *Elements of Probabilistic (Stochastic methods) of Musical Composition* (1962), in Texts about music and Architecture, Athens - 2001 S.76

[9] CF: Candlish, S. (1997) 'Wittgensteins Privatsprachenargumentation', in Savigny, Eike von, (ed.) *Wittgensteins Philosophische Untersuchungen*, Berlin: Akademie Verlag.

[10] CF: Zeller, Hans Rudolf, in Musik Konzepte 54/55 *Iannis Xenakis* - Hrsg. Heinz Klaus Metzger und Rainer Riehn, Mainz 1987

[11] CF: Frisius Rudolf: *Konstruktion als chiffrierte Information*, in Musik Konzepte 54/55 Iannis Xenakis – Hrsg. Heinz klaus Metzger und Rainer Riehn, Mainz 1987

[12] Discussion with Iannis Xenakis at Delphi 1985 – Konstantinos Kakavelakis

[13] CF: Hartouni, Valerie, *Cultural Conceptions: On Reproductive Technologies and the Remaking of Life*, Univ of Minnesota Press, 1997

[14] Nyberg, L., et al. 2000. Reactivation of encoding-related brain activity during memory retrieval. *Proceedings of the National Academy of Sciences* 97(Sept. 26):11120-11124

[15] CF: - Wiener, Norbert: *God and Golem*, M.I.T. Press 1966

[16] CF: Searle, J. R. *The Rediscovery of the Mind*. MIT Press, 1992.

[17] Benjamin, Walter: *The Work of Art in the Age of Mechanical Reproduction*, 1935

His visionary course gazed the future through a multifaceted and rich reformation of historical experience. The adventurous transmissions from order to disorder, or from continuous to non continuous situations were composed with an extra-ordinary originality. Rational Order of Disorder focus on the interior landscape demonstrating in many cases that the entropy of the universe which increases implies negative entropy, and just as much as is required to have created the order can after disappear. To expect the unexpected highlighting a new perspective thinking it was formulated to the irregular grains of sound clouds of concrete syllables in his work NUTS for 12 voice mixed choir or in the segmentary transformations in his composition ΠΟΛΛΑ ΤΑ ΔΙΝΑ influencing symbolically through these sudden situation-changes the articulative configuration of other instrumental groups.

Xenakis conceived the Parmeneidian being, as an absolutely smooth mathematical point, a being that is able to fill the eternity through its reproduction by existing in concrete space and time. Parmenides denies that there are many things, maintaining instead that only one thing exists<sup>18</sup>. (It's not so clear, however, what he thought this one thing is.)<sup>19</sup> In this concrete space can take place each time different versions of a primary incident.

Therefore from a musical philosophical point of view, this reproduced event, structured from different composers every time and in a different way as a perpetual form of creation or recreation, takes in space - time continuum a different role. It creates also new unanticipated situations. Of great interest is in anyway the interpretative resynthesis of ancient greek texts in the mycenaic dialect at the free acoustic landscape of Mycenae (ΠΟΛΥΤΟΠΙΟΝ ΜΗΚΥΝΩΝ), occurred in an other space time frame. Could these sound reminiscences of ancient dialects, that were reproduced, recomposed and intensified from Xenakis, influence the behavior of space-time?

Ψ Ψ Ψ Ψ Ψ, Ψ Ψ Ψ Ψ Ψ, Ψ Ψ Ψ Ψ Ψ, Ψ Ψ Ψ Ψ Ψ, Ψ Ψ Ψ Ψ Ψ, Ψ Ψ Ψ Ψ Ψ,  
 i-je-to-ge di-u-jo do-na-ge pe-le po-le-na-ge a-ke di-we  
 Ψ - ε - τοί κ'ε Δί-φυοι δῶ-ρα κ'ε φέ-ρει φο-ρή-κας κ'ε ἄ-γει, Δί-φεῖ  
 ΚΙΝΕῖ ΚΑΙ (ΠΟΜΠῆ ΣΤΟ ΊΕΡΟ) ΤΟΥ ΔΙΑ ΚΑΙ ΦΕΡΕΙ ΔΩΡΑ ΚΑΙ ΦΕΡΟΝΤΑΣ ἄγει, ΣΤΟ ΔΙΑ...

(Here it would be of importance to remember the revised opinion of Einstein for the space. He believed henceforth that the matter had been created from space-time and that the space for Einstein was henceforth the main entity and the matter a secondary one.) Einstein believed indeed that the space eats and destroys the matter)<sup>20</sup>.

How is that possible in sound transformations? If we conceive the above letter elements as elements of a sound row we will realise that it incorporates via the sequence of letters a sound genetic information. The linear sequence of letters determines the linear sequence of concrete sound-schemes. Several time zones in depth, give possibilities to new perspectives in time and space. For example quiet of space and noise of daily life is a zone of the unheard. The sequence of the ancient Greek words are in a 'quantum superposition' of being dead, being alive and being both dead and alive simultaneously.

This indefinite quantum system is real, in the sense that it can be experimentally recreated. However, once the quantum system is *observed*, or measured by someone, then this indefinite quantum system, described by a wave-function of quantum superposition of all the possibilities, suddenly 'collapses' into a definite state. In case of even accidental fault it can be established a permanent change in the total genetic information of the sequence. We have therefore a new chain

Xenakis called this new situation a regenerated being-point<sup>21</sup> which is a combination between the static being of Parmeneidian and the Herakleitian flow. A birth of such event is like a new line in space time continuum which this new statement repeats expressive elements of the primary being in a new modus. Perhaps this redefinition carries out a correction of an older error. The necessity of creation of a new law is above an old<sup>22</sup>. Iannis Xenakis directed also his attempts to escape from a hard science conception. He imagined a world where the music could coexist with the scientific thought, but also with the incidental changes of the nature, exempted from any causation. His music can be analyzed in terms of its continual becoming, not as static object. *Abstract Mechanism* means for him the challenge and possibility to form an alliance between poetry and logic to reassemble different creative ideas.

[18] Cf: Marc Charles Ess: *Notes on Parmenides Creation* [of what-is] --> creation out of something different from what is A --> B. Something different from what-is = what-is-not B --> C But what-is-not cannot be. C --> ~E (non-existence) [non-existence is inadmissible, a contradiction: ~~E ] Therefore, creation is not possible: ~E That is, this argument combines what later logicians will call deductive syllogism [ A --> B --> C --> ~E ] and denial of the consequent [ A --> ~E, ~~E, /.. ~A ] --> his point of difference with the Pythagorean cosmogony, in which the unit is placed within the unlimited, and the void is inhaled. The denial of the void also leads to the claim that what-is, is not divisible, but homogeneous, continuous and hence, what-is is motionless, finite, like a sphere

[19] See also Marc Cohen: *Parmenides Stage I* <http://faculty.washington.edu/smcohen/320/parml.htm>

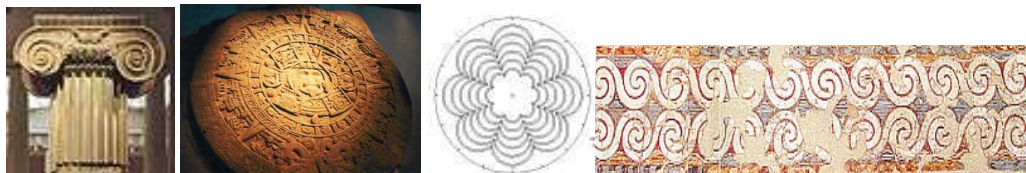
[20] A. Einstein: *The concept of Space*, Nature, 125, 1930, Sel. 897-898

[21] Iannis Xenakis: *Between Skyla and Haryvdis* 1981, in *Texts about music and Architecture* Athens 2001

[22] Iannis Xenakis: *The significance of law, in the Music and originality*, in *Texts about music and Architecture* Athens 2001

VIOLONCELLE SOLO  
 ΝΟΜΟΣ α für Siegfried Palm.  
 αφιερωμένο στους Αριστοτέλη Τζαρομάκη  
 Βύρυστο Τσακούδ και Φέλιξ Κλάιν 15' Iannis Xenakis

In his experiments he used many methods in order to design imaginary sound models. Sometimes through meditative process, sometimes deterministic but also through the probability theory and statistics. Always considered himself however as a master of his results although these efforts were prosperities of autonomous musical systems or – families<sup>23</sup> as he described them which do not include aesthetics. His *Anti-Hume philosophical point of view* in his logic of empirical reasoning was against a “single overriding intention”. He used *dynamical polysystems* bridging different families of dynamical systems. Its realisation took place through three different writing systems, three different codes. *The Cartesian (graphic), the musical, and numerical.* The reliable combination of these three codes reveals us a rich recoiling hose. In this coil are also included the possibilities of destruction, of an explosion or of an interruption of the continuity of its motion and all what stays with it in relation also including causality and returning to zero. The dynamics of things as they *are* can be reinterpreted also in music in terms of how they *happen*. Space is finite but time is infinite. Defining time as finite we invent a trick to insert a sound event in the space/time relationship as an ever changing stream. I give attention to a point in which Xenakis gave significance and also realized its great interest. I mean the magical expression of coil as an aesthetic decorative element<sup>24</sup> that can be found mysteriously in different unconnected cultures.



The coil relates itself with the frets of rivers and snakes and however in this expression of the universe all cultures have found something common which exists everywhere in the nature. In my opinion the coil symbolizes the way that universe moves serenely and the acquisition of new forces round a central idea, a central mind, a central hypercosmic *sound-world*. I refer to an archaic theurgical conception of *cosmogogenesis* which has to do with the indispensability of its diachronic representation via symbolic sounds.

Cosmogogenesis was for many ancient religions a sound process which continues its expansion by creating always greater reheating and energy transformation. However through its unanticipated redevelopment this event falls constantly to strong information alterations travelling to our unconscious through various forms. The chaotic information constitutes a part of a widest spiritual informative system and not simply a mechanism, an interrelated system in which moving atoms and in particular soul-atoms in a spherical shape, as Democritus allegorically gave to them their name. With the help of their shape they achieve a fast moving speed towards different directions. Therefore Democritus thought that soul-atoms are related to the atoms of fire. Interesting is how the pre-Socratic philosophy gives important intellectual conquests that much later were examined and proved by applied modern sciences. (See also the relation between Spherical Quantum Waves and electromagnetic Waves-and always remember that Aristotle's logic does not work in the quantum world.)

If we investigate therefore the way of distribution of sound in air we will discover some relations between the theories of metaphysical materialism of Democritus and the theories of metaphysical idealism of Plato, Kant and Shelling concerning space-time continuum, realising the heat process that creates the distribution of sound in dry air. Energy can be transformed into another sort of energy.

[23] Iannis Xenakis: *Scientific Thought and Music*, in Texts about music and Architecture Athens 2001 S.142-143

[24] Iannis Xenakis: *Universe is a coil*, in Texts: about music and Architecture Athens 2001

Through the vibrations befalls heat but also energy transformation of some importance, which means an environmental change in concrete environment. Through transformation of the sound energy in other forms from microcosmos to macrocosmos, even to the empty space where the molecules exist in a wider space between them, it seems possible that they could influence the behaviour of space-time continuum. Acoustic waves create pressure gradients in the medium as they travel through it. But they travel also through Plasma. Plasma system formed by the interaction of the earth's magnetic field and the solar wind. Strong interactions can occur between plasma waves and the underlying charged particles in the plasma. Sound energy macroscopic flow could be generated also in nonadiabatic atmosphere. The properties of a medium are determined by the microscopic processes in it. The microscopic processes are dominated by collective, rather than binary, charged particle interactions. Electrons and ions both exhibit either adiabatic or inertial responses. Ions have lower inertial or plasma frequency and they create much lower thermal speed than electrons. Schrödinger used descriptions about sound wave phenomena while he developed his famous equation describing the movement of electrons in an atom. There is an abstract entity, called the wave function and which is symbolized by the Greek letter  $\psi$  (psi). Acoustical waves and gravitational waves are related to spacetime dynamics. Xenakis as also Einstein conceived the space-time continuum not as imaginary place but as a real one. And this space-time it is the main entity in which various fields and matter are moved, and in which above all dominates the interaction.

Both space and time in Xenakis world are relationships in connection with the transformations of the strange nature behaviour towards an organic connection. A passage from one condition to another (See also *Wheeler and Feynman's Theory 'Response of the Universe' – The universe and the laws of nature are interconnected by co-mingled matter waves*). Freedom in Xenakis case means not simply the kantian consciousness of necessity imposed upon life. It shows mainly when freedom runs out and cannot offer any guidance or reason that could count as motivating. Humans as creatures of the Universe are governed by unforeseeing impulsiveness.

Through his music Xenakis investigates the correlations between reasoning and imagery, impressions and beings, formal and non-formal ontologies. (See also his stochastic methods of Micro and Macrosynthesis). Such a creative procedure overcomes the range of what we usually call normative necessity in music. Computers, knowledge in human brain, mathematics, cerebral cortex-structure, lateral connections, dynamic receptive field, artificial intelligence, mechanical systemics, time-relationships are playing important role in Xenakis relation to music. But Xenakis does not deify *machina*. He says *the computer has to be like a tool and not like a goddess or a god - (goddess is better)*<sup>25</sup>. Aesthetic experience means for him an unexplored Territory (meta-morfe)<sup>26</sup>.

We are all following the flow of its eternal changes. When something become different by free acts of choice (this means also the way of music interpretation or misinterpretation and corruptive paraphrasis), it cannot be anymore the same. Xenakis tried with his music of universal smoothness to bridge the chasm between the intuitive musical and mathematical continua.

Even if Iannis Xenakis had fear of Apollo and admired much more Venus, he was off a pilgrim of Delphi. Envisioning an interconnection with the ancient virtue of the unification of spirit and body Iannis Xenakis was an athletic figure that incarnated contest and spirituality. He is undoubtedly one of the personalities that determined with his limpid thought the development of the 20th century music.

- Did he search methodically with the aim to discover some secret gates in the fifth dimension of the space (invisible spiritual world) in the sacred landscape of Delphi by diffusing to its open fields the sounds of his music? (Spirit-Thought-manifestation)
- What Xenakis pursued from this environmental intercommunication and the interaction with the Greek nature?
- Which role did they play however the assymetric percussive sound combinations of Psapha in the open delphic landscape or other open landscapes?

In my ears still sounds, from the omphalos of earth, their catalytic effect. Percussive permutations and combinations which created the increase of entropy and led to phenomena of diffusion revealing new possibilities and horizons for the mortals. *The number of permutations of n different percussive sound taken n at a time is n!*. May be all these questions they currently remain unanswered. What however is sure is that the sound-worlds of Iannis Xenakis they have created a new region of space and time in a different phase from the one from which they were emanated. Their echoes have reflected a multi-dimensional information about the environment modulating also our emotional response to music. In ancient greek spirit Xenakis searches the music which is out of the time range<sup>27</sup>. As the oracles of Delphi the soundscapes and universes of Iannis Xenakis, announce to us the necessity of an eternal effort towards the inventiveness, but also the evasion from a lowering uninominal style. This effort should be an inevitable condition which should had as target, the survival of humans<sup>28</sup>.

[25] See Xenakis, Reynolds, Lansky and Mâche discuss Computer Music – Moderated by Thanassis Rikakis, Computer Music Conference/Festival - Delphi 1992

[26] CF: Iannis Xenakis: *Sound Universes (1977)*, in TaMaA Athens 2001

[27] CF: Iannis Xenakis: *Antiquity and Contemporary Music* – Athens (1966), TaMa –Athens 2001

[28] CF: Iannis Xenakis: *Universe is a coil*, in TaMaA Athens 2001

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