The Trajectory of Art:
moistmedia and the technologies of consciousness

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Abstract

New developments in art generate new discourse and call for new language. Terms such as *technoetics*, *moistmedia*, and *bio-telematics* signal the emergence of new media practices. The infrastructure -- material, conceptual and spiritual -- needed to support this emergence calls for creative agency, architectural forms and cultural organisms hitherto unknown and unprecedented. As artists we can alert ourselves to the future, just as we can redefine ourselves, but in the process of redefinition -- dependent as that may be on telematics (planetary connectivity), nanotechnology (bottom up construction), or quantum computing (accelerated and expanded cognition)–we may be wise to seek re-entry into the spiritual domain that has long been blocked by the excessive materialism and insistent reductionism of our times.

Key words:
Technoetics, bio-telematics, nanotechnology, artistic creation.

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Resumen

Los nuevos progresos en el arte generan un discurso nuevo y buscan un lenguaje nuevo. Términos como *technoetics*, *moistmedia*, y *bio-telematics* señalan la aparición de nuevas prácticas de los medios. La infraestructura—material, conceptual y espiritual—necesaria para apoyar esta aparición requiere la agencia creativa, formas arquitectónicas y organismos culturales hasta ahora desconocidos y sin precedentes. Como artistas nos podemos alertar sobre futuro, como también podemos redefinirnos, pero en curso de la redefinición—dependiente como puede ser sobre la telemática (conectividad planetaria), nanotecnología (construcción fondo encima), o cognición quántum (acelerada y ampliada)—podemos ser sabios y buscar reingreso en el dominio espiritual que ha sido largamente bloqueado por el materialismo excesivo y el reduccionismo insistente de nuestra época.

LA TRAYECTORIA DEL ARTE: MOISTMEDIA Y LAS TECNOLOGÍAS DE LA CONCIENCIA

Palabras clave:
Technoetics, bio-telematics , nanotecnología, creación artística.

If the mission of 20th century art was to make the invisible visible, 21st century artists will be concerned with finding ways to allow us to sense the invisible in the visible. The ratio of the senses may shift, and new perceptual modes may be uncovered. The ability to work with these invisible forces and fields rather than to try simply to represent them, and the wish to engage directly in their implementation rather than with their implication, will become increasingly evident as biophysics develops greater sensitivity to the modulation of new realities arising from our direct participation in life processes, and art acquires new means of construction and implementation.

As with all forms of prediction, art is suspended between the arc of desire and the pit of fear, promoting both optimists and pessimists, enthusiastic visionaries and those for whom technology presents the gravest threats to our humanity. Trajectories into the future rarely hit the target, the outcome in any case being that the arrow is seen as either half in or half out. I am constitutionally inclined to see it half in, making me a somewhat outlawed optimist, while many take a view that is more dystopian. During an Ars Electronica conference in 2002, Paul Virilio stated that "after 9/11 there are no more pessimists or optimists but simply realists and liars". To which my response is: yes, liars certainly, but to which reality do the realists subscribe? Is it a given or an emergent reality? If given, who gave it: God or the State? (which was effectively the same thing in the West for many centuries -a tradition President George Bush has revived with his own fundamentalist business partners). A voice from the conference audience to which Virilio did not respond made the assertion that today is the day of the spiritual man, and that we are in a race between the destruction and survival of spirituality, and the computer can help us to resolve planetary problems. It is within this context that we can understand reality as an emergent phenomenon. That is the core issue in my mind. If we do not develop a planetary consciousness over the next fifty years we are lost. However, planetary consciousness has to be built bottom up, there is no top down blueprint.

One thing we have learned over the past thirty years (not least from Heinz von Forster and Francesco Varela), and have embodied in our techno-art, is that reality is constructed, and that we build worlds each in our different ways. We mirror that understanding in our virtual realities, and bring both ambiguity and sophistication to the idea with mixed reality technology, where consensual realities mingle, subtly fusing the habitual with the virtual. The power of metaphor both in art and science is hugely persuasive. Think how many of us artists have absorbed the apparent contradictions and counter intuitive paradoxes of quantum physics without having the faintest idea of the how

the theories work or even the remotest command of the numeracy needed to evaluate the proofs. Not that scientists are immune to the persuasion of metaphor, as Mara Beller has shown in her book *Quantum Dialogue; the making of a revolution*, where she shows how the war of interpretation in quantum physics was won with metaphor by Neils Bohr and his Copenhagen School. Similarly, the data driven visualisations of the cosmos or of our own microscopic texture are coded conventions at best and ideological instruments at worst. Donna Cox of the US National Center for Supercomputing Applications, the doyenne of astrophysical visualisation, currently completing a doctorate in my Planetary Collegium, shows how pernicious these *visaphors* (a term she reserves for data driven visualisations) are in confusing metaphor with "real" reality in public understanding. But still and all we have the question as to what that real reality might be.

In the science of Cosmology, for example, confusion reigns. Scientists do not know what makes up 99% of the Universe. Although recently there have been notable advances in our understanding of star formation and galactic structure, there seems to be another component of the universe -possibly making up most of its mass- which we cannot see, and which we do not understand. This is the *dark matter* and *dark energy*, quite other than the baryonic matter of protons, neutrons and electrons that we can detect. Similarly in genetics, our current horizon of knowledge is very low. About 97% of the human genome has been designated as "junk" since we have no idea of its function. In many cases we are dependent on metaphor as much as data to explain the world, and in any case we are in a sorry state if we confuse metaphor with reality, and data with truth.

These issues will no doubt be prioritised in future art-science discourse. There is a another element which has hardly surfaced in the past 25 years, and which will provide the stem along which art/science ideas will sprout and maybe

blossom That is the issue of consciousness, the nature of mind. This will bring to the table, guests whom science will view with the utmost hostility, fearing that their carefully constructed castle, from which society has been more or less ordered since the eighteenth century, may be shown to be a house of cards. These despised ones are those knocking on the door of materialism and strict causality, defying determinism and wrecking the reductionist ethos. They are looking for a more subjective science, with a first person perspective. The reductionist- objectivists will hold the garrison for quite a while until their myth of *neutral* science is exploded. Many outlawed epistemologies are re surfacing -field theories of various complexions, on either side of the psychic divide, new organicism, contesting views of what constitutes biophysics, and models of spirituality, freed of the shackles of religion.

Before addressing more directly the issues of art-science convergence, I think it is important to consider the institutional frame within which new media art might emerge. This brings me to the issue of an academy / museum / laboratory nexus that has hardly been addressed at any serious level of description. Most artists get their initial ideas about what art is or could be from the art academy. School has always been an arm of government. Public education was first instituted in response to industrialisation, to produce workers with numeracy and literacy skills that would enable them to work machines, tend accounts -and keep time. Education was seen as training. The UK education act of 1944 sought to replace training with education: innovation was desperately needed to reconstruct society after the ravages of world war. Art schools were liberalised, leading to the golden years of the 60's. which brought forward those tendencies that had been lurking at the margins of European culture since Cezanne's shifting viewpoint had altered the trajectory of art: kinetic art, mixed media, performance. Art schools became the base for social action and social criticism, and where the nature of individual identity could be questioned.

However, while along with the advent of conceptual art, the ground was being prepared for interactivity in art practice, *art education* made an about turn: back to the idea of *training* - this time to create technologically-informed consumers. Things now are at a pretty low ebb. Art education will have to transform itself or die. There is a curiously persistent view that creativity divides up neatly into pure and applied practice, fine art and design, and a convenient division of modes, plastic arts, music, theatre and so forth. It is becoming seen as a largely bankrupt model. But if not these divisions, then what kind of educational and creative structure could we hope to see emerge? Certainly the larger domains of Information, Structure, and Concept will define the learning landscape overall, while in each domain issues will arise within the context of speculation, theory, analysis and social application. Within the matrix that integrates questions of society, the self, materiality, and consciousness there is a kind of five axes involved in amplifying thought (concept development); sharing consciousness (collaborative processes); seeding structures (self-organising systems); making metaphors (knowledge navigation); constructing identities (self-creation). There is little doubt that the academy is in need of an overhaul.

The Big Bang

Of the convergence of bits, atoms, neurons, and genes that constitutes the Big Bang at the heart our new media universe, it is the *bit* that is the most familiar to artists: computational systems and digital media have dominated the techno-art scene for at least 30 years. More recently in the late 1990s, work with *genes* has produced some exemplary projects, most notably perhaps the transgenic work of Eduardo Kac: his GFP Bunny *Alba*, and the Net-interactive *Genesis* being significant in the respect. *Neurons* are the province of artists using Artificial Intelligence, neural networks, and robotics. The *Artbots* exhibitions led by Douglas Repetto in New York over the past three years have show, for example, a wide range of challenging possibilities in this domain. Work with brain sig-

nals of cultured rat cells controlling robots on the other side of the planet has distinguished the collaborative work between Steve Potter's lab at Georgia Tech and Guy Ben-Ary's lab at the University of Western Australia. Indeed it can be argued that work in laboratories of one kind or another will increasingly replace work in studios; many eventually being located in truly remote regions such as the deep ocean or outer space. Also at Perth, Oron Catts and Ionat Zur have gained international recognition with their *Tissue Culture and Art* synthesis of biotechnology, art and ethics. This brief introduction does no more than point to a fraction of research currently undertaken by artists joining with scientists and technologists in the domain of moistmedia - the substrate for creativity in which dry computational and wet biological systems converge.

Of the moistmedia components - bits, atoms, neurons, and genes-- it is issues around the *atom* which this paper will address: the nano level of perception, the molecular domain, and more particularly the organism's information network of photons that DNA molecules emit, technologically paralleled by telematic networks across the body of the planet. As science digs deeper into matter, moving, re-assembling, and coordinating atoms and molecules in the nanofield, the distinction between the organic and the technological will become less distinct. Similarly our molecular knowledge may lead us to a better understanding of changes in consciousness and perception afforded by pharmacology. What ever is the case, we are now increasingly focussing our attention on the very small, at a level far beyond miniaturisation: a nanometer is one billionth of a meter. This is at a level of perception that is, in any retinal sense and however technologically augmented, literally out of sight. So much so that the scanning tunnelling microscope (STM) calls for touch rather than vision to navigate the nano field, and to manipulate individual atoms. The nanofield mediates between pure matter and pure consciousness in that it stands between the material density of our everyday world and the numinous spaces of subatomic immateriality.

The significance of the nanofield as interface between two levels of reality can hardly be overestimated.

The Nanofield

There are a number of ways to view the nano phenomenon. The popular view is that advanced by Arthur Drexler[1], who has provided a mechanistic and materialist understanding of its potential. His challenging ideas of nano engineering and materials science promise self-replicating nanobots, self-renewing structures and self-assembling environments, working within the body, within its environment, and in outer space. While molecular robotics, positional assembly, and self organisation suggest exciting possibilities for building new materials, manufacturing nano machines, and generally creating the fundamental blocks of nature into whatever configuration we desire, there is a danger that the outcomes, even when beneficial in engineering, medical and social terms, could be spiritually hollow, and as such would exacerbate rather than relieve the excessive materialism of our time. In medicine for example there is the hope that artificial entities could identify or anticipate breakdowns in living systems, and provide aid to the failing organism. However some find that this view violates our understanding of the body as constituting a holistic, mind/body field. When the body is seen as no more than a material collection of atoms, it may make sense to apply a materialistic strategy of repair. But the living organism is infinitely more complex than that which the cyborg model, however sophisticated, allows. Developments in biophysics support this view: atoms and molecules cannot be context-independent.

The other way of understanding the significance of our penetration of the nano world is to view these developments from the point of view of consciousness.

[1] Drexler, K.E

This could lead to what could be called technoetic ontology since nano is the plane on which technology and consciousness can meet. The challenge this presents to the artist cannot be met simply by reiterating the common mantra "art/science, art/science, art/science" since the rhetorical reach for some kind of simplistic, interdisciplinary marriage of art and science will probably not provide an answer, just as it seems doubtful that the dialectical approach to technology and culture would be sufficient to begin to map the possible territories of consciousness that the nano field might open up, particularly when our culture is so materially invested in products, objects, surfaces and structures. Western Art celebrates materialism even when it employs telematic diffusion or an ephemeral conceptualism: the faux-postmodernist cannon insists that process must always lead to product. It is said to be due to the exigencies of the market but is equally, no doubt, evidence of the innate conservatism of some artists or museums. Digital art, for all its inherent immateriality, has played into this materialist scenario. Moreover, the intense attention applied to the body during the last decade of the 20th century has also contributed greatly to the situation.

Materialist may see working in the nano field as the end game, but it is not necessary to embrace a transcendentalism to see that nano is located between the material density of our everyday world and the numinous spaces of subatomic immateriality. Nano mediates between pure matter and pure consciousness. The STM cuts through the density of matter to a more singular level of perception; a level which is both touchable and untouchable, immediate and remote, as Grimzewski and Vesna have shown[2]. Nano watching changes the ratio of the senses: to touch is to see. The auditory sense can also be involved. Grimzewski has discovered that to touch the atomic plane is to hear the voice of molecules, whose sounds may signal distress as much as harmony. The atomic force microscope (ATM) allows him to hear the scream of a yeast cell as it is doused in

[2] Gimzewski, J and Vesna, V(2003) The Nanoneme Syndrome: blurring of fact and fiction in the construction of a new science. In: Techhoetic Arts: a journal of speculative research.1.1. pp 7-24.

alcohol. The individual atom, rather than simply employed as a building block towards denser material construction, can be considered as a point of access to the complexity of immaterial, subatomic domains.

Biophotonics

In the context of the brain, the nanofield provides the transition point between quarks and elementary particles, on the one hand, and molecules, cells [neurons], and neural assemblies on the other. In the context of consciousness, it is located between our material frame and the subtle body, between organs and aura. It is towards the aura, and the function of biophotons in living processes, that this paper is principally directed. From the perspective of both biophysics and mysticism, a consideration is advanced about how an understanding of biophotons might contribute to a new prospectus for telematic art: to find creative inspiration in the parallelism between the internal information network of biophotonic light in the body and the external networks of telematic communication.

While photons - simple particles of light - have been successfully teleported, it is only very recently that there has been success with far larger and more complex particles in transporting the physical properties of an atom, such as its energy and spin[3]. This involves the "entanglement" of two atoms, where a disturbance to one particle instantly affects the other, no matter how far away it is. This speed of transfer will not only advance the development of a quantum computer but has far reaching implications for telematic communications. And in the context of a technoetic parallelism between information networks in the body and across the Earth, it amplifies the concept of the mediated mind.

[3] Achieved independently by The University of Innsbruck in Austria and the National Institute of Standards and Technology in Boulder. Reported in Nature 17.6.04.

Research in biophotonics, and of electro magnetic fields, is of significance to the development of moistmedia. It will no longer be seen as paradoxical that our scientifically-driven thought will relate to models of consciousness and human identity based in the spiritual traditions of cultures previously dismissed as alien or marginal. Art will increasingly take on a more psychoactive complexion and it will be found useful to link archaic models of consciousness, such as we find in Amazonia for example, or amongst the Tsogho of Gabon, and ideas of quantum coherence, such as we find in biophysics, and biophotonics research.

The term "biophotons" was first used by Fritz Albert Popp in 1976 to describe the quantum phenomenon of photonic emission from all biological systems. All living systems emit biophotons, both those absorbed initially from the sun and those emitted spontaneously from molecules. Building on the ideas of Alexander Gurwitsch, the Russian biologist who introduced ideas of the "morphogenetic field" and "mitogenetic radiation", Popp argues that every change in the biological or physiological state of the living system is reflected by a corresponding change of biophoton emission. This may be indicative, he argues, of an information channel within living systems that may relate to chemical reactivity in cells, intercellular communication, and biological rhythms. Biophysics is a field-based science. Recently, field theory has been popularly but usefully reviewed by Jean McTaggart, in The Field[4] just as twenty years ago, a morphogenetic model of biological process informed Richard Sheldrake's A New Science of Life[5].

Field thinking equally informs healing practices of various complexions, and the discovery of spontaneous biophoton emission lends scientific support to some unconventional ideas about the body's self-regulation, such as various

[4] McTaggart, L. 2003. The Field: The Quest for the Secret Force of the Universe. New York: Quill.
[5] Sheldrake, R.1983. A New Science of Life. London: Granada.

somatic therapies, homeopathy and acupuncture. For example, the "ch'I" energy flowing in our bodies' energy channels (meridians) may be related to node lines of an organism's biophoton field. The "prana" of Indian Yoga physiology may be a similar regulating energy force that has a basis in weak, coherent electromagnetic biofields. Inevitably, these very approaches are also open to consumer abuse on the Web.

A useful definition of the biophoton has been given by Masaki Kobayashi a physicist at the Tohoku Institute of Technology in Sendai, as being a spontaneous photon emission, without any external photo-excitation, through chemical excitation of the internal biochemical processes underlying cellular metabolism. "Biophoton emission, originates in the chemical excitation of molecules undergoing oxidative metabolism. It is distinct from thermal radiation arising from body temperature. Biophoton phenomena have been surveyed from cellular or subcellular levels up to individual organism levels"[6].

The quantum coherence thought to define a living organism conforms to the understanding of quantum mechanics that holds that material reality forms an unbroken whole that has no parts. As Marco Bischof argues in his brilliantly accessible and comprehensive Introduction to Popp's Integrative Biophysics[7]:

"These holistic properties of reality are precisely defined mathematically by the Einstein-Podolsky-Rosen (known as "EPR") correlations. In quantum mechanics, it is never possible to describe the whole by the description of parts and their interrelations. This holistic view of quantum theory cannot be rejected anymore because the strange EPR quantum correlations of non-interacting and spatially separated systems have been amply demonstrated in many experiments"[8]. (Popp.59-60)

[6] www.tohtech.ac.jp/ee/ca/kobayashilab_hp/BiophotonE.htm
[7] Popp, F-A. & Beloussov, L. (eds). 2003. Integrative Biophysics: Biophotonics. Dordrecht: Kluwer.
[8] Aspect et al., 1982; Aspect & Grangier, 1986; Selleri, 1988; Duncan & Kleinpoppen, 1988; Hagley et al., 1997.

Thus, the reductivist world-view of classical physics must give way to the understanding in quantum mechanics of the primacy of the inseparable whole, and of the fundamental interconnectedness within the organism as well as between organisms, and that of the organism with the environment.

Connectivity and coherence

This raises an important issue regarding the connectivity of new media art –simply put between what fields might interconnectedness lie. How might the internal information system of networked photons interface with the external information network of our telematic planet? Art may embrace the central concepts and features of the new biophysics: coherence, macroscopic quantum states, long-range interactions, non-linearity, self-organization and self-regulation, communication networks, field models, interconnectedness, non-locality, and the inclusion of consciousness. Indeed, these attributes relate to the cannon of interactive art, the five-fold path of connectivity, immersion, interaction, transformation, emergence. The defining aesthetic of our present cultural shift towards moistmedia is technoetic, the outcomes of our exploration of consciousness (noetikos) with the tools and techniques of technology, making consciousness both the subject and object of art. Techne and Noetikos have always been related in ancient cultures, and it can be argued that art has always been a spiritual exercise despite its repression by materialist ideologues.

Within the field of biophysics, a revision of older theories of living systems, abandoned with the successful rise of molecular biology, is now taking place. Mae-Wan Ho, Director of the Institute of Science in Society[9], visiting Reader in Biology at the Open University in the UK, and a former colleague of Popp,

[9] www.i-sis.org.uk

advances the idea of the "new organicism". She argues that contemporary western scientific concepts of the organism are leading us beyond quantum theory and offering insights that reaffirm and extend our intuitive and poetic notions of spontaneity and free will. Freeing itself from scientific determinism and mechanistic control, the organism becomes a sentient, coherent being that is free, from moment to moment, to explore and realise its possible futures. The traditional opposition between mechanists and vitalists was already dissolving when Newtonian physics gave way to quantum theory at the very small scales of elementary particles, and to general relativity at the large scales of planetary motion. The static, deterministic universe of absolute space and time is replaced by a multitude of contingent, observer-dependent space-time frames. Instead of mechanical objects with simple locations in space and time, one finds de-localized, mutually entangled quantum entities that carry their histories with them, like evolving organisms.

There are many contesting definitions of biophysics. As we have seen, Marco Bischof supports the view that the new biophysics will be based on quantum theory, and not classical mechanics –and that it must refer to non-equilibrium thermodynamics, instead of equilibrium thermodynamics. Organisms are open systems far from equilibrium. Field thinking is one of the central elements of the new biophysics, as a means to synthesize the complexity of its details, and as the means to model interconnectedness and non-locality. Bio-electromagnetics will play a central role in the new biophysics, and the existence of non-electro-magnetic fields in and between organisms cannot be excluded.

Heisenberg, who argued that there are two places in the human system where the quantum indeterminacy of a single particle can have a profound influence, explored the relevance of quantum indeterminacy of elementary particles for biological systems, especially human systems. The first important effect is that of mutation in the genetic code. The second is the alteration of the behaviour

of neurons during human thought processes. Marco Bischof makes the point that the new biophysics needs to extend its inter-disciplinarity even beyond natural science. Consciousness cannot be excluded anymore from biophysics, although the difficulties of such an extension should not be underestimated. There is now enough evidence showing that consciousness is a causal factor in biology and not just an inconsequential epiphenomenon. Starting from the analysis of the phenomenology and the experimental evidence for mind-body interaction, field models may provide the necessary tools for bridging the mind-body gap.

Globalisation at the planetary level and entanglement at the quantum level, means that not only are we are all connected, but that our ideas, institutions; even our own identities are constantly in flux. Consistent with this, moistmedia bridge the artificial and natural domains, transforming the relationship between consciousness and the material world. To assist in the embodiment of this connectivity of mind is part of the artist's task, to navigate the fields of consciousness that new material systems will generate, is part of art's prospectus.

Mixed Reality

At the material level, Mixed Reality[10] provides us with another skin, another layer of energy to the body, adding to the complexity of its field. Instead of populating Mixed Reality space with (virtual) objects we would be more integrative if we considered it as a medium for the creation of fields, or as we could say, as an extension of the biofield itself. Just as the relationships between biophotonics and psychic states is under examination, so too might virtual space be seen as the generator of altered consciousness. Just as DNA is the main source of bio-

[10] Ohta, Y. & Tamura, H. 1999. Mixed Reality: Merging Real and Virtual Worlds. Tokyo: Ohmsha & Springer-Verlag

photon activity, so might Mixed Reality be the field in which new possibilities for living systems might be rehearsed, and from which a cybermorphology might emerge. At a gross level, a Mixed Reality environment can be seen as an accelerator or radiator of the biophotonic transmission of knowledge. Since a photon is a signal of a quantum nature, it therefore emanates from a quantum system. The whole body must be considered in a state of quantum coherence, with each molecule interacting with each other within a field. Just as the field has a regulatory effect on molecules, so molecules give boundary limits to the field. What happens then when a Mixed Reality environment extends this boundary and redefines the field? Mixed Reality, networked reality, and telematic virtuality, I would suggest, become entangled with the quantum states of coherence, leading to the emergence of universal connectivity and non-linear relationships that exist beyond the classical constraints of space and time. Biophotons orchestrate the quantum coherence of the living being, and may lead us to ideas in some pixel/particle exchange of establishing the quantum coherence of virtual states. The concept of coherence describes the wholeness of the organism, which if we follow for example Andy Clarke's concept of the human organism as inclusive of its technological extensions[11], should embrace the whole as a unified sentient field.

The first detailed theory of coherence of the organism was published by Herbert Fröhlich in 1968[12]. Metabolic pumping will excite macromolecules such as proteins and nucleic acids as well as cellular membranes (which typically have an enormous electric field across them). These will start to vibrate and eventually build up into collective modes, or coherent excitations, of both phonons and photons (sound and light) that extend over macroscopic distances within the organism and perhaps also outside the organism. The coherent organism is a

[11] Clark, A. 2003. Natural Born Cyborgs: minds, technologies, and the future of human intelligence. Oxford: OUP.
[12] Fröhlich, H. "Long-Range Coherence and Energy Storage in Biological Systems." International Journal of Quantum Chemistry, 2, 1968.

quantum superposition of activities -organized according to their characteristic space-times- each itself coherent, so that it can couple coherently to the rest.

Ontological engineering

It is within this complexity that I foresee the insertion into art practice of an additional technology, a new but very ancient technology, that of the psychoactive plant. A sort of cyberbotany may arise around the instrumentality of such plants as the shamanic liana, ayahuasca (banisteriopsis caapi), known as the vine of the soul, and used in countless communities in Brazil, Colombia and further afield. It is my contention that the pharmacological processes of Vegetal Reality and the computational systems of Virtual Reality will combine to create a new ontology, just as our notions of outer space and inner space will coalesce into another order of cosmography. Ontological engineering! Cyberbotany covers a wide spectrum of activity and investigation into the properties and potential of artificial life forms within the cyber and nano ecologies, as well as the technoetic dimensions and psychoactivity induced by the psychoactive vegetal products of nature. First suggested to me by the writings of Jeremy Narby who speculates that the origin of shamanic visions may be found in the light emitted by DNA, I see great significance in the idea that biophoton light, stored in the cells of the organism, actually in the DNA molecules of their nuclei, gives rise to a dynamic Web of light constantly released and absorbed by the DNA that may connect cell organelles, cells, tissues, and organs within the body, serving as the organism's main communication network.

There is much to be gained in both biological sciences and the arts from research that seeks correspondences and collaborations between the technologies of machines and plants, within the natrificial space of the Three VRs[13]. Indeed it can be argued that the whole ecological movement would gain if a cons-

[13] Natrificial: the symbiosis of the natural and artificial achieved through the integration of virtual, validated and vegetal realities

tructive dialogue with technology would be instituted which tried to see the deep correspondences between western science and archaic knowledge. The problem is not with science but with the rejection of science at its leading edge in favour of the old scientific paradigm, that very paradigm which refuses the spiritual implications of quantum physics, for example, or the very intelligence of plants, so to speak, that biophysics might reveal, or indeed the biophotonic matrix that may embrace all living systems of the planet. The space in which biophotonic and teleportation art might be constructed can be located by the triangulation of connectivity, syncretism, and field theory. What is at stake is that all integral systems be coherent. Connectivity is at the root of cultural coherence, syncretism at the root of spiritual coherence, and field theory at the root of quantum coherence.

Conclusion

As new science emerges -with biophysics, biophotonic informatics, organicism and the forming potential of fields- so too must art develop, perhaps beyond the digital, virtual and telematic domains, towards the realisation of new possibilities for living and learning in the new biotechnological world, weaving our realties within the universal network of light. In our new understanding of the world and ourselves, what once classically was seen as coherent is now seen as an illusion, rather as if we had acquired access to behind-the-scenes of Duchamp's Etants donnés, in the Philadelphian Museum. Metaphorically, one could say that we are moving from the darkened chambers of early digital art into a biophotonic light, providing a new field in which we can address Schrödinger's eternal question: "what is life?". In so doing we may as artists begin to provide a bridge between the biophotonic information networks of our bodies and the telecommunication networks of our technological world.