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A Reconnaissance of the Cosmos: A Critical Response to Konstantin S. Khroutski's *BioCosmology – Science of the Universal Future*

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Abstract
In the last four centuries there have been a number of cosmological and evolutionary insights which have informed our understanding of the architecture of the universe and life on earth. Nineteenth and twentieth century theories of evolution continued this speculative trend in relation to human evolution and emergence. Konstantin Khroutski's bio-cosmology paradigm offers a new insight into understanding biological and social processes. This paper provides a critical response of some areas of Khroutski's theory as well as will proposing new ways in which bio-cosmology can further contribute to evolutionary science.

Introduction

Kostantin Khroutski's thesis on bio-cosmology and the science of the universal future provides an invaluable insight into the Russian cosmist tradition to a western audience. Khroutski's thesis is philosophically engaging and medically interesting as it concerns itself with the human health design. It is an important philosophical project since it seeks to develop new insights into evolution with an onus on universality. Khroutski's articulation of the cosmist tradition has been processual over many years. Its philosophical underpinnings proffer a needed critique to the present materialist scientific paradigms. My critical response to Khroutski utlilises anthropology, philosophy, neuroscience and futures studies. My interdisciplinary response is necessary in order to sufficiently tackle the breadth of Khroutski's ideas. I locate Khroutski's theory in five sections. My aim is to provide both a critical reading of bio-cosmology and to contribute to possible areas for future discussion.

Microcosm/Macrocosm

Khroutski's cosmist theory accords with the ancient idea of humankind as microcosm (Greek: microcosmos = "small universe"). Similarly Khroutski avers that human biological and social aspects are integrated with the macrocosm. Within his notion of the microcosm Khroutski articulates his universal function model – basic cosmist functionality (BCF). "This means that all subjects are intrinsically and basically dedicated for the realization and execution ultimately of its (her) his definite function" (Khroutski 2006:13). In other words the subject integrates with the environment in a symbiotic manner. For Maturana and Varela (1988) the execution of a subject's function includes the coherences between its structural coupling with other living systems. This is a basic law of autopoiesis. By virtue of their structural coupling living systems know how to live in their specific niches. As Maturana points out:

> Further, the organism is not a whole by itself, rather it results as a whole in the relational space in which it is conserved as an autopoietic system through its interactions in its niche.

The relationship between microcosm/macrocosm hints at the mystery of the human mind. While the human brain has evolved for developing survival skills (i.e. hunting, avoiding predators) how is it that "cognitive processes" tuned themselves to understanding the place of *Homo* in the universe (Davies 1992:151). For Khroutski this cognitive ingenuity is part of the human movement towards higher consciousness. Khroutski realises the significance of holism in his evolutionary paradigm. Separation is an unnatural artifice which leads to a pathology down the line. Integration is kernel to the cosmic evolutionary process. This is what Bateson alludes to in the following:

> But when you separate mind from the structure in which it is immanent, such as human relationship, the human society, of the ecosystem, you thereby embark, I believe, on fundamental error, which in the end will surely hurt you (1973:461).

For thinkers such as Nasr (1995, 1968) humanity's separation from nature was expedited four centuries ago with the emergence of a scientific model which reduced the sacred character of the cosmos. This eventuated in the de-mystification and de-sacralisation of the universe and the creation of a sharp division between religion and science which has

remained ever since. The scientific tendency to quantify nature is for Nasr a misguided endeavour which merely perpetuates ecological destruction and dominator ideologies (Kalin 2001). Nasr endorses the promulgation of *scientia sacra* or sacred knowledge which dwells at the heart of the world's religious traditions (Kalin 2001:447). Important here is Khroutski's notion of the subject as forever integrating "autonomously and hierarchically other subjects" from the molecular to the galactic (2006:13). This idea coincides with Nasr's belief of the correspondence of "hierarchy between the absolute and the relative," since hierarchy intimates multi-layered existence (Kalin 2001:448).

BCF and Self Disclosure

According to Khroutski the BCF is based on two principles:

1.It is a property inherent to an organism.

2."BCF is an ideal towards which the organism aims" (Modell 2006:3). This second principle is characterized by an inherent health design, incorporating human physiological and social systems (Khroutski 2006:13). These systems are crucial in the self actualization and self unfolding of the BCF. I am reminded here of the metaphysical theory of the medieval Sufi thinker Moiyuddin ibn Arabi. In ibn Arabi's theory the human being is viewed as a synthetic threshold (*barzakh*) which both separates and unites elements. The human species contains the cosmic principle of creative disclosure – that is, the unfoldment of Divine creativity within the multiple forms of human mentation (Afifi 1964:84). Cosmic creation undergoes constant transformation including the "world of thought and the world of imagination" (Izutsu 1983). Based on this principle, freedom, may constitute a form of cosmic disclosure. As Saniotis (2006) declares, "Ibn 'Arabi's universe is poised within a dualism between possibility and reality; a dynamic evolution of new orders, new life worlds, new knowledge, and new kinds of consciousness — a quantum universe."

> The essence of the cosmic evolutionary process of life on Earth consists in the increase of a degree of freedom of personal intentional ontongenetic acitivity of man (Khroutski 2006:14).

The drive towards greater freedom seems to reaffirm the predilection of natural processes towards greater complexity. Freedom, in this sense, is akin with Whitehead's belief that entities and societies seek their fulfillment or *telos*, which constitutes an emergent process (Langdon 1999:113). This *telos* is embodied in the third phase of human evolution in which individuals are capable of generating transcendental knowledge – the level of self realisation (Khroutski 2006:14). I would go further. The ultimate health design of each human is cognate to a process towards greater self awareness, an evolution which coincides with ibn Arabi's metaphysics.

In anthropology, knowledge of self and myth are often generated in the creative field of ritual. Turner identifies ritual as a storehouse of symbolic meanings which foreground the key concerns of human life. During the middle of limen (Latin: meaning 'threshold') phase of rituals, ritual participants enter a symbolic zone which is betwixt and between social categories. Turner calls this phase liminality because of the considerable amount of ambiguity which is generated during this ritual phase (Turner 1969, 1974). During liminality, symbols are often inverted or distorted from their familiar meanings, where they can embody ludic representations. These representations compel ritual participants to reflect upon the social and cosmological order of things. A feature of liminality is that it may create a generic bond between ritual participants based on "a community or comity of comrades and not a structure of hierarchically arrayed positions" (Turner 1967:100). He coins this non-structured relationship *communitas*. Here, new found freedom within the ritual environment is crucial for provoking new kinds of knowledge or even transcendental understanding which is carried into society (Myerhoff 1974).

Onus on Existential Control

Khroutski's thesis discusses the human health design as being constituted by a symbiotic process between human and environment. The ontogenetic makeup of human beings is informed by freedom which is emergent in independent beings. Importantly, apart from the need for ontological security human beings are also confronted by varying degrees of

ambiguity which impinge upon their internal state. A large part of ambiguity derives from the fact that the human world is surrounded by a world which has no subjectivity – "the world of things" (Jackson 2005:111). Devereux (1967) has earlier suggested that human beings may respond with trauma from the unresponsiveness of matter. For Devereux a "denial of response" by the world of things may prompt various psychological and cultural strategies for alleviating "peoples' panic reactions (Jackson 2005:116). The non-human world is often incorporated in ritual and social life in order to resemble the human world (Jackson 2005:111). It seems that human consciousness needs to incorporate the non-human world as a means of mitigating the indeterminacy of nature. This is the existential dilemma which Heidegger alludes to by his concept *gewerfornheit* (thrownness). That is, human beings are thrown into the world without their choosing, a world which had existed prior to their emergence, and which remains after they transpire; a world which is by and large indifferent to their existence. This leads to a "crisis of agency" (Jackson 2005:112).

Such a crisis is evident in the new genetic technologies where there is a lack of scientific consensus about their safety or ability to predict their repercussions (Jackson 2005:112). What is becoming evident is that the human health design is becoming more under the control of new bio-technologies. These technologies are seeking to control life's blueprint via human *techne*. How do we as humans come to terms with the encroachment of the non-human world via new technologies and their potential to transform the human design? The point here is that an understanding of human ontogenesis must include its relationship with the non-human world.

An implicit element of human encounters (I would also include here encounters between humans and non-human others), as Jackson explains, is a need to establish a sense of personal authorship over one's life, to be given voice during interactions with others, without countermanding one's feeling of propriety. The key element here is that human beings need to believe that they are masters of their own lives, and to be allowed to exercise various strategies — ways of maintaining "self-determination and self-identity" while adjusting to the Other (Jackson 1998:19). "We are "the authors of ourselves,"

writes Myerhoff (cited in Bruner 1986:12). Bruner calls for an anthropology of experience in which human beings are viewed as "active agents in the historical process who construct their own world" (1986:12). Dilthey further explains that those cultural manifestations that are contiguous with inter-subjective life are the domain "in which the subject discovers himself" (1976:203). This idea corresponds with Khroutski's BCF as a continual process of self discovery.

Brain, Novelty and Metapatterns

In this section I would like to discuss the role of the brain, novelty and metapatterns which may provide an insight to understanding emergence. Human consciousness provides us with some insight how imagination and categorization works (Laszlo 1996:151). Of course, Levi-Strauss (1972) some decades earlier contended that human oppositional categories reflect the binary structure of the brain. My understanding of human intelligence concurs with Calvin who notes that an examination of human intelligence may path the way into the intelligence of other creatures (Calvin 1996:152). In reality it is still a difficult scientific exercise in pondering how high intelligence evolved on earth, or how it might develop on other planets? (Calvin 1996:153) Any examination of human intelligence must inevitably explain the link between novelty and meta-patterns. In Bateson's terms (1973), metapatterns are patterns which describe other patterns. Another description of metapatterns are common patterns which occur across biological, cultural and mental systems such as spheres, tubes, webs, cycles, sheets etc. The human brain depicts various metapatterns:

1. The brain is sphere like in shape, which is composed of binary cerebral spheres. This coincides with Levi-Strauss's structuralist idea that the oppositional categories which humans impose on the world reflect the binary structure of the mind (1966).
2. The neo-cortex is a membranous sheet; its structure accommodates for great surface area for carrying neuronal information throughout the cerebrum.

3. The brain is composed of a matrix of tubes in the form of dendrical neurons and micro columns.
4. The brain is connected by a web like configuration between different Brodman's areas.
5. The brain is multi-layered – a tripartite structure composed of brain stem, limbic and neocortex.
6. Brain cells are membranous.

The brain is connected to the rest of the body which co-ordinates an intricate bio-feedback system regulating bodily systems.

Metapatterns are an important tool of analysis of the mind since it is constantly evolving in evolutionary time and during a person's lifetime (Volk & Bloom 2007:32). Culture mimics its rudimentary form from nature and has elaborated on it in the ways of natural cycles and systems patterns.

In relation to novelty, metapatterns are linked to symbolic thought in the forms of myths, narratives, and cultural information which elaborates on natural metapatterns. Coining Bateson novelty is a "difference which makes a difference" since it can change cultural evolution. For example, science as a form of novel thought has been able to expedite cultural evolution via military, food, and medical technology. In other words, novelty is a "metasystem transition" in Turchin's words since it leads to a higher organisation of thought (1981). Novelty uses metapatterns for generating new modes of thought and for inducing self reflexivity. For example, rituals invariably use various core collective symbols which are multi-valent. As I suggested earlier, such symbols enable participants to ponder over key life issues and find novel ways for understanding such issues and the participant's place in the social sphere (Turner 1969, 1974). The degree in which metapatterns are interrelated is expressed in the following equation:

f [x1…xn] = dx1/dt t… dxn/dt

Thought novelty is a confusion of patterns. Inter-connectivity demands a complex neuronal network. New thought is created when an error through an established pattern of nerve cells occurs (Henneberg 2007). If a stochastic flow of information is compatible with other patterns already functioning it will be "noticed" i.e. incorporated into one of the patterns. When a new thought is created and accommodated into a metapattern it is likely that it will be accepted (Henneberg 2007).

As an organic system the brain consists of a dynamic flow of interactions between its many levels and parts. The brain is based on patterns of organisation which create patterns. These patterns "both envelop and are enveloped by other patterns." The brain is in a constant process of exchange of information and transformation.

As a feedback structure, the brain's mechanism is circular in which input and output interacts. "This complex interaction between perception and action evident in explaining and learning behaviors, is the means by which a system…" has the capacity to adapt and increase its complexity (Bale p. 35).

An ecological view of the brain, thus, considers it as consisting of integrated neural subsystems and micro-hierarchies which are regulated via the osmotic flow of energy, matter and information into novel patterns (Bale). One of the areas of investigation is how the brain learns to be an interactive element in a community of brains (Churchland & Churchland 1995:74). In other words, how does the brain come to represent the social, moral and political features of the world in which it lives as well as the "character of other cognitive creatures with which it interacts" (Churchland & Churchland 1995:74). These two areas have yet to be explained convincingly by neuroscience or evolutionary science. This is one domain in which bio-cosmology may contribute. How do meta-patterns fit in the cosmist tradition and the human health design?

Conclusion: Cosmism and New Evolution

The evolutionary model purported by Khroutski foregrounds the concept of emergence from the molecular to social levels. This is a universalistic insight which merges the best of the Russian cosmist tradition. At this point, any discussion of evolutionary emergence must take into account the advent of new technologies which may contour future human evolution. Laszlo's ideas are influential here. Laszlo et al (1996) endorse a universal change in human cognitive maps (mental representations) in order to prompt a necessary global change in consciousness. At present, many societies worldwide are governed by dominator principles, based on competition, accumulation, and fragmentation (Laszlo et al 1996:106). Consequently, these societies are undergoing a systemic pathology. Bateson refers to this entropic process as being autocatalytic: the larger the population the more technology is used which gives human beings an illusion of power over the 'other' (Bateson 1973:466). This process is mathematically presented in the following:

$$\mathbf{A = \sum (p_s \,.\, t)}$$

P_s = population size
t = the rate of technology

The pre-eminence of classical economic theory which objectifies nature to the whims of human pursuits has distorted the human psyche. The present global cognitive map is impeding the potential of human consciousness towards the kind of realization fostered by Khroutski's bio-cosmological paradigm. While humans have become conscious of their evolution, "we must now make evolution itself conscious" (Laszlo et al 1996:116).

Future cognitive maps will have to undergo a transformation which begins at the learning level. What kind of pedagogy is suitable for this task? Possibly, an ecology of evolutionary learning as purported by Bateson. Bateson contends that a major problem in present day human learning is its persistence with habituated ways of thinking that are regressive, rigid, and lack internal rigour (Bateson 1973). Evolutionary learning is largely based on nature's principles of co-operation and integration (Montuori 1993). Whereas science privileges precision and empiricism, evolutionary learning emphasises the

importance in integrating human experience. As Russell affirms (1994): "Through the continuous integration of narrative into the experience-explanation-experience relationship, the discussion of ethics becomes an inevitable ingredient of the learning process." Similarly, David Polkinghorne provides the tie between human stories and social ecology when he says that: "Through the action of emplotment, the narrative form constitutes human reality into wholes, manifests human values, and bestows meaning on life" (Polkinghorne 1988:159). Evolutionary learning is symptomatic of an emerging "evolutionary cognitive map" (Laszlo et al 1996:117) that identifies the positive possibilities of meta-patterns.

Another crucial step in evolutionary learning refers to Bateson's notion of flexibility. Flexibility can be defined as "uncommitted potentiality for change (Bateson 1973:473). Human society contains many variables. Each variable consists of upper and lower limits within which the variable can move (Bateson 1973:472). Thus, the greater degree of flexibility between inter-linking variables, the greater will be the potential for flexibility to be spread throughout a system (Bateson 1973:472). This process encapsulates Bateson's term *mind*. Mind is the integration of meta-patterns within a flexible system; this system acts as an osmotic membrane whose interface integrates "diverse elements" (Laszlo 2001:144). In this sense mind embraces a "holos consciousness" (Laszlo 2001:126). Holos consciousness is posited on a marked level of communication between people who make use of the "strands of connection that bind them to each other and to nature" (Laszlo 2001:113). Awareness of this level of connectedness plays a vital part in human evolution (Laszlo 2001:113).

I would like now to comment on the development of nano-biotechnologies in relation to future human evolutionary cognitive and body design. A number of theorists claim that the combination of nanotechnology and genetic engineering will advance human cognitive and somatic evolution (Roco & Bainbridge 2003). The convergence of these technologies offer new ways for examining the architecture of DNA and cellular sub-systems at the molecular level. The futurist Ray Kurzweil (2000) goes further. He claims that nanotechnology will eventually supplant parts of the body, even entire organs, which will be rebuilt according to nano-design principles. The redesigning of the human body will force humans to rethink

on what constitutes corporeality. Moreover, Harraway (1991) postulates that humans have already become hybrids; an interface between biology and machine, since many people spend a large part of their lives with cyber systems. Additionally, global cyber space networks are enabling people to create multiple cyber identities, thereby, being freed from the evolutionary bounded body. One question which may be asked is whether the virtual body can be viewed as a self-evolving subject? Kurzweil (2000), Bostrum (2000, 2001), and Greenfield (2003) also propose that in the future mind could be downloaded into virtual bodies via neural implants. The transhumanist Bostrum claims that downloading mind simulations into cyberspace will endow the recipient with immortality. If such technology proves to be feasible in the future it will radically change our understanding of the body and consciousness.

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