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LIVING SYSTEMS, SEEING SYSTEMS, BEING SYSTEMS:
LEARNING TO BE THE SYSTEM THAT WE WISH TO SEE IN THE WORLD

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SYSTEMS THINKING: AS IF LIFE MATTERED

IT IS A MODERN DAY TRUISM TO STATE THAT OUR WORLD is ever more interconnected, interrelated, and interdependent. The progress of far reaching social structures with powerful technologies has allowed us to change the face of the earth, and now we're already looking to Mars for further conquest[1]. Historically speaking, humankind has more or less consciously pursued the strategy of adapting the environment to its needs in order to gain mastery over nature. We have moulded and modified our surroundings however we please in order to be more comfortable. By the second decade of the third millennium, this strategy of adapting the environment to us in accordance with our every whim has brought us over the threshold of the carrying capacity of the life support systems of planet Earth ... and still we continue our planet plundering ways.

It would be incorrect to assume that the only alternative to adapting the environment to us is to adapt ourselves to the environment. And yet, there are those who argue that this is, indeed, the only way forward, pointing out that "you hear about the death of nature and it's true, but nature will be able to reconstitute itself once the top of the food chain is loped off – meaning us."[2] In other words, since life may actually go on much better without human beings, our greatest contribution to cosmic evolution may be to ensure a healthy planetary ecosystem by removing its prime threat – the human race!

This is not a strategy for the inclusive fitness of human beings. One of the main challenges to humanity at this juncture in our collective history is to find systemic alternatives to either adapting the world to us to the point of overload, or adapting ourselves to the world to the point of evanescence. The options in this third direction must promote systemic sustainability, that is, integral approaches to human relationships between ourselves and other systems based on co-adaptation – strategies for adapting *with* the world, rather than either adapting ourselves to it or forcibly adapting it to us.

TOWARD A TECHNOLOGY OF HUMANE INTERACTION

Technology is often portrayed as something apart from culture, acting upon individuals and societies in dehumanizing ways. It has been demonized as the machines, tools, and material objects of human production that bend us to their mechanistic will in a relentless drive for increased efficiency, effectiveness, efficacy, and subjugation of nature. The casualties left by the wayside are feared to be ethics, aesthetics, spirituality, and humankindness. Fifty years ago, Jacques Ellul warned of this malevolent aspect of technology, writing reprovingly of how "the machine tends not only to create a new human environment, but also to modify man's very essence."[3]

There is a problem with such views, generally identified with technological determinism. The problem is that they separate technology from culture when in fact, technology is best conceived as a form of *crystallized culture*. Tornatzky defines technology "any tool or technique, any physical equipment or method of doing or making, by which human capability is extended."[4] With this definition in mind, the term technology should be understood to pertain to a complex system composed of people, organizations, role structures, skills, and knowledge bases, in addition to the hardware produced in workshops and factories.

People produce technology – more specifically, individuals and groups in particular cultures produce specific technologies. What they produce, as well as how they produce it, reflects and embodies the values of their culture. That is why technology transfer

LOW-TECH	small-scale technologies wich do not require complex infrastructure, are relatively simple to use, cost little to construct or obtain and next to nothing to operate.
HIGH-TECH	sophisticated technologies which require complex infrastructures, technical expertise to construct and/or use, and are often costly to obtain and operate.
HARD-TECH	the tools, implements, machines, devices and equipments that are the physical embodiment of technology, and/or technological process based on engineering techniques and principles: 'know-how'.
SOFT-TECH	the 'scaffolding' (support systems, group processes techniques, design methodologies, decision making processes) for individual and collective self-determination: 'know-why' and 'know-what for'.

TABLE 1 ~ *Four Types of Technology.*

ALTERNATIVE	equipment or organizational forms that represent viable alternatives to existing 'main-stream' technologies. For example, small-scale organic farming instead of large-scale energy-intensive cultivation techniques.
INTERMEDIATE	technologies that stand halfway between traditional and modern technologies. The ox-drawn plough is an intermediate technology; more sophisticated than the traditional hoe, but less complex than the tractor.
APPROPRIATE	technologies characterized by organizational simplicity, high adaptability to a particular social or cultural environment, sparing use of natural resources, low cost of final product, and/or high potential for employment.
BLENDED	a form of appropriate technologies designed for culturally sensitive introduction in societies other than those in which it originated. Technologies that have been adapted to the norms and values of local cultural conditions.

TABLE 2 ~ *Four Means of Technology.*

is no longer considered a legitimate activity; it implies cultural hegemony. When we transfer a technology to others, even within our same culture, we impose our values and our beliefs no less than our artefacts of production.

TABALES 1 and 2 show various formulations of technology which can be combined. For example, one could develop an Appropriate form of Soft Technology through an innovation in collective decision making for a specific local self-governance system by drawing on and incorporating traditional approaches to collective self-determination. Or by repurposing used plastic soft drink bottles to capture and channel light into dark housing spaces one can innovate a Alternative form of Low Technology for skylighting. Whatever the combination, the systemic impact of the innovation must be considered. The development and use of technologies that serve to obtain immediate objectives without consideration of whether or not they connect us to life is an expression of a non-systemic consciousness and the lack of well developed relational intelligence[5]. If we are concerned about the dehumanization of work and the malevolent pressures of efficiency and profit maximization

in the wake of industrialization and technological advance, we need only realize that these are the very values with which *we* imbue our technological systems. Rather than charge technology with irresponsible conduct, we need consider why it is that we have not met the challenge of matching technological intelligence with a commensurate advancement in relational intelligence and systemic consciousness. As Aurelio Peccei noted in 1977, the development of such wisdom is essential in giving direction to technological developments for the benefit of humankind, and indeed, one might add, for re-stabilizing the well-being of Earth herself given the impact of human presence. TABLE 3 suggests an emerging trend in systemic innovations that draw on Hard and Soft Technologies, respectively.

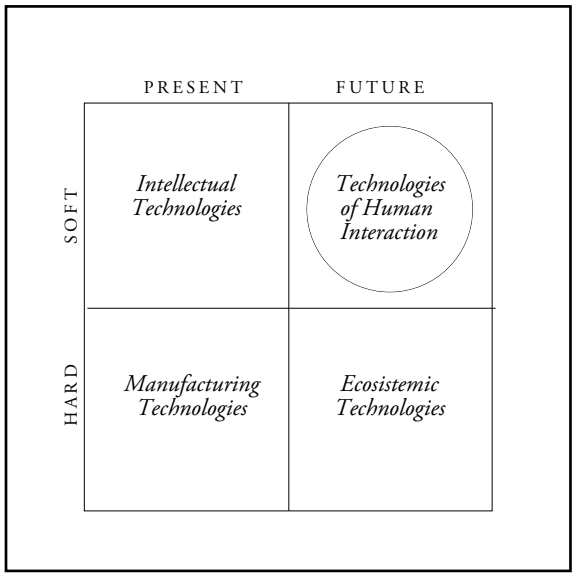

TABLE 3 ~ *Evolving Orientations of Hard and Soft Technologies.*

The central challenge to systemic change agents of today and for tomorrow is the development and nurturing of relational intelligence applied to systemic innovation. The specific challenge is to consciously create Technologies of Organizational Communion (TOC) to contextualize and humanize the Technologies of Information and Communication (TIC) through which we operate so much of our contemporary social, economic and political networks. To emerge a glocal eco-civilization[6] we need both the connective and distributive power of TIC and the humanizing and relational power of TOC, *combined.* In this way, each TIC we produce will embody an evolutionary, planetary, and thrivability ethic that affirms life – and the quality of living it. In short, the challenge of developing a TOC for each TIC that is innovated is a challenge to our cultures; one to which only a life-affirming evolutionary ethos is appropriate. This is central to the emerging area of research and development focused on systemic innovation.

THE ROLE OF HUMANS ON EARTH: CONNECTORS, CONVENERS, CURATORS OR KILLERS?

As we engage with the process of ushering in the conditions for the emergence of a thrivable planet – listening into the nurturance spaces and seeking the systemic leverage points for the emergence of a glocal eco-civilization – it will be increasingly important for our species to continue to explore ways of fitting our individual melodies together to create sustaining and enduring harmonies with the broader symphony of life on Earth. This is more than just a nice metaphor: it is the essence of *syntony*. As an organizing force in societal evolution, syntony involves an embodiment and manifestation of conscious evolution: when conscious intention aligns with evolutionary purpose, we can foster and design evolutionarily consonant pathways of human development in partnership with Earth. It is the effort to cultivate these dynamics that constitutes what is often called a *syntony quest* (A. Laszlo 1999). To engage in a syntony quest, we have to learn certain skills, to develop and practice certain competencies, and to manifest a willingness to think and act interactively. The notion of "will" – of active intention and passionate purpose – is crucial here. In fact, it is what makes the difference between merely seeking harmony and consciously curating a constantly emerging dynamic of syntony.

Kingsley Dennis makes the case for post-Millennials to be called The Phoenix Generation in his book by that name, the subtitle to which is *A New Era of Connection, Compassion, and Consciousness.* This era is only just dawning now, but already intimations of hope, pragmatism, and spiritual awakening can be sensed in many young people. As cyber-cowboy novelist and technology futurist William Gibson noted, "the future is already here – it's just not evenly distributed."[7] Know where to look for it, how to recognize it, what to do with it, and how to cultivate it are all part of the mindset, skill set and heart set of the this new generation, this new breed of syntony seekers.

This act of listening into what Stuart Kauffman has called the adjacent possible[8], of curating that which appears as though it were almost seeking to emerge, this is the act of intuiting, imagining, and co-creating a narrative of thrivability. It is what was so deliciously captured by Arundhati Roy's evocative assertion:

"Another world is not only possible, she is on her way. On a quiet day, I can hear her breathing."[9] Cultivating this sense-ability – and the corresponding response-ability that it calls for – is part of the new set of competencies needed for a thrivable human presence on Earth.

I once sat next to a bee keeper on trip. As it turns out, this man knew he was going to be a bee keeper when he was three years old. I had many questions. At one point in our conversation, he told me that all the species of plants and animals know what role the bees play in their ecosystems, and they depend on the bees to fulfil their role. This prompted me to ask him what role the animals and plants know that humans play in their ecosystems and whether or not they depend upon us to play that role. We sat in silence for a long while…

I later asked this same question of my daughter Kahlia, who was thirteen at the time. She thought about it and told me that perhaps the role we play is that of being the connectors. Connecting life with life, connecting what is with what might be. I continue to listen to the echoes of this answer and all the questions it births. It seems to affirm the spirit of Janine Benyus' observation that life creates conditions conducive to life[10]. This is a far cry from the species centrism and zoophobia that characterizes so much of what Darwinism became at the hands of Herbert Spencer and others over a hundred years ago… Rather, it is an appeal to the designerly way of being so well captured in George Bernard Shaw's poetic reflection: "'You see things as they are and ask, "Why?" I dream things as they never were and ask, "Why not?'"[11] This is the spirit of syntony and those who curate its emergence.

THE LISTENING CONVERSATION OF DAOLOGUE

Taking on the mantel of evolutionary co-creators with life on Earth involves re-storying our narrative as Human Becomings and re-membering our place in what Joanna Macy, John Seed, Arne Naess and Pat Fleming have called The Council of All Beings[12]. To this end, it is essential to engage in the ongoing and ever emerging improvisational conversation-jam that is the hallmark of creative evolutionary processes. David Price writes about the notion of engaging in a *daologue* with Earth[13]. Price asks, "how might we listen and act differently given this perception of the conversation of the Earth, this enveloping planetary layer, this connecting and collecting intelligence, this sum of all dialogues: *this Daologue?*" The dimensionality of daologue evokes exploration of and engagement with the way in which conversation, play, dance, and all aspects of life as art connect us to *ourselves*, to *each other*, to *the more-than-human world*, and across time to *past and future generations* of all beings. These are the four intertwingled dimensions of systemic thrivability. As syntony seekers, engaging in this daologue across all four dimensions is a matter of consciously connecting, intertwingling, and curating the emergence of the World Narrative – the bigger story of our individual and collective being and becoming. The quality and character of this story, therefore, depends on the way in which we author our life along these four dimensions. While these dimensions have been articulated and explored in detail in other articles[14], suffice it list them here:

- The intra-personal dimension of sustainability; thrivability within oneself;
- The inter-personal dimension of sustainability; thrivability with one's communities and social systems;
- The trans-species dimension of sustainability; thrivability with the more than human world;
- The trans-generational dimension of sustainability; thrivability with past and future generations of all beings.

By consciously, purposefully and intentionally curating each of these dimensions *in dynamic relationship to the other three*, it is possible to for us – both personally and in the sense of our larger humanity – to take on the mantel of evolutionary co-creator of a World Narrative that is led with:

1 - Passion – meaning vibrant, intense, and compelling enthusiasm
2 - Integrity – dignity or elevation of character; worthiness, honour and respect
3 - Grace – simple elegance, considerateness and a composed way of being
4 - Control – personal mastery in (not of) all situations in which I find myself
5 - FLOW – tuning my actions and attitudes to harmonize with my surroundings

These are the "five movements of syntony," as I call them. They constitute the ground upon which the sense-abilities of syntony can be cultivated and the response-abilities of the syntony seeker can be brought into practice.

DREAM THINGS THAT NEVER WERE – WHY NOT?

Imagine what it would be like to live in the world with both the sense-ability and the response-ability

of an evolutionary co-creator – fully functioning and fully engaged. Inspiration for what this might entail can be found not only in the wisdom practices of traditional cultures but also in the imaginings of creative minds that reach out to portray future possibilities through fictional thoughtscapes. Isaac Asimov was a master of envisioning the adjacent possible. In the fourth of the five books of his Foundation Trilogy, he writes of a planet called *Gaia.* The planet is not our Earth and the story he recounts is set far in the future. However, as he tells it we are let in on a vision of what things could be like for us were the evolution of consciousness to develop to its full potential on a planetary scale here, on Earth. Through the character of Dom, a being from Gaia, we are shown an artscience that approximates this way of being. In the excerpted passage, below, Dom explains his hobby to Trevize and Pelorat, the intrepid space explorer and the donnish old friend who has accompanied him to Gaia.

> He led them way into another room where, on a small circular table, there was a group of smoky lenses connected in pairs.
>
> "These," said Dom, "are Participations I have designed. I am not one of the masters, but I specialize in inanimates, which few of the masters bother with" […]
>
> "How are they used, Dom?"
>
> "You put them over your eyes. They'll cling. They do not transmit light. Quite the contrary. They obscure light that might otherwise distract you – though the sensations do reach your brain by way of the optic nerve. Essentially your consciousness is sharpened and is allowed to participate in other facets of Gaia. In other words, if you look at that wall, you will experience that wall as it appears to itself" […]
>
> Pelorat placed one pair over his eyes and they clung there at once. He started at the touch and then remained motionless for a long time. […]
>
> Dom said, "What did you experience?"
>
> Pelorat said, "It's hard to describe. The wall seemed to twinkle and glisten and, at times, it seemed to turn fluid. It seemed to have ribs and changing symmetries" […]
>
> Dom sighed. "[…] these Participations are enjoyed primarily for their aesthetic value, [although] they have their practical uses, too. A happy wall is a long-lived wall, a practical wall, a useful wall."
>
> "A *happy* wall?" said Trevize, smiling slightly.
>
> Dom said, "There is a dim sensation that a wall experiences that is analogous to what 'happy' means to us. A wall is happy when it is well designed, when it rests firmly on its foundation, when its symmetry balances its parts and produces no unpleasant stresses. Good design can be worked out on the mathematical principles of mechanics, but the use of a proper Participation can fine tune it down to virtually atomic dimensions. No sculptor can possibly produce a first-rate work of art here on Gaia without a well-crafted Participation and the ones I produce of this particular type are considered excellent – if I do say so myself."[15]

The ability to listen into the harmonies of evolutionary emergence comes across clearly in this piece. In fact, Dom implies that art is necessary to "fine tune" applied science for the dynamics of physical existence to be not only harmonious but actually felicitous. Of course, his Participations are an advanced form of technology that can be used to heighten aesthetic sense ability. However, it may be possible to evolve our consciousness so that such crutches are not necessary. The challenge is to interpret the flow of events through which we consciously participate in the shaping of our futures and those of all things with which we interact, and then to learn to intentionally align our actions with evolutionary purpose. In this sense, evolutionary sense-ability and response-ability are the Participations of our consciousness, and it is up to us to craft, polish, continually refine – and above all – employ them.

> "It *is* a craft, you know. It is inherent in the human mind, but it must be developed in a very subtle and difficult manner. It takes many generations to reach its full potential, but once well begun, it feeds on itself. We have been at it for over twenty thousand years and the sense-of-Gaia is that full potential has even now not been reached."[16]

So it seems Gaia may have a bit of a head start on us, but it is not too late for us here on Earth! In fact, the timing couldn't be better. Who knows where this process of conscious evolution could lead given twenty thousand years, and the important thing to realize is that we *are* given twenty thousand years – and more!! What will Earth be like in twenty thousand years – like Gaia, or like a barren radioactive wasteland, or just another planet – maybe with life and maybe even with intelligent life, but without human descendants? Which narrative we participate in creating will depend on the vision we have and the volition we evince as conscious participants in the play of evolutionary emergence.

In the long run we may look back and, like one of Asimov's characters, think how "we do not understand a human being who cannot sense his place in the scheme of things, who does not feel like part of a greater whole" (:389). At this point in the adventure of our species on this planet of Earth, it is the combination of evolutionary sense-ability and evolutionary response-ability that stands the best chance of providing a future creating, life affirming and opportunity increasing pathway. The first step on this journey begins with the heartfelt realization that *what we do* – both as individuals and as a species – *counts*, for this is the essence of evolutionary response-ability. But even before we take this step, we must first let ourselves know that *what we feel counts.* This is the essence of evolutionary sense-ability, and

without it we may never develop the necessary Participations of consciousness.

THE WHOLE CREATURE: COLLECTIVE INTELLIGENCE AND UBUNTU

In a recent *Spanda* article on the *Qualitative Dimensions of Collective Intelligence: Subjectivity, Consciousness, and Soul*[17], Charles Eisenstein makes the case for an expanded appreciation of collective intelligence. He argues that "we are social animals; we are not separate individuals having relationships – we are relationship. Beyond the separate self, the smallest unit of collective intelligences is a partnership, and most of us have experienced that in a partnership, who we are changes. We might consider that "who we are" in total is the integration of who we are in each of our social, economic, and ecological relationships." This notion of collectivity, of an identity that is interdependent (neither independent nor co-dependent) with others echoes the notion of *Ubuntu* in the belief system of the Xhosa and Zulu peoples of Southern Africa. It stands in stark contrast to the Cartesian declaration that because I doubt, I must think, and because there is an "I" that is thinking, I must exist: *Dubito ergo cogito. Cogito ergo sum* (I doubt, therefore I think. I think, therefore I am). Instead, Ubuntu expresses the sentiment that "I am because we are." In other words, my human condition is conditioned and ultimately defined by the collective interactions of all with whom I come in contact. The condition of the whole provides context and sense for my own existence. As Eisenstein suggests, "we cannot say that collective intelligence is secondary to individual intelligence, or a mere epiphenomenon arising out of relationships among individuals. Each level, individual and collective, co-creates the other. To identify the locus of subjectivity in the individual is a cultural conceit – one not shared by other cultures that valued the we above the I, and gave it ontological primacy."

These aspects and considerations of the interminglement of individual and collective being suggest a shift toward a worldview of interconnection, interdependence, and essential interrelation – what Eisenstein refers to as the conditions of *interbeing*. He asks, "why is it assumed without much debate that no one can have direct access to the subjective experience of another person (or non-person)? This is obvious only if we conceive and experience ourselves as fundamentally separate from each other. There are other stories of self, however. We could see ourselves, as many spiritual traditions do, not as separate beings but as "interbeings," not just interdependent but interexistent." The emerging narratives of systemic sustainability, of evolutionary syntony, of glocal thrivability all draw upon this wellspring of understanding[18]. It is the basis of innovation that holds the promise of fostering a syntonious human presence on Earth.

LEADERSHIP AND SYSTEMIC INNOVATION

Contemporary approaches to the development and implementation of advances in the application of technology tend, at best, to emphasize the synergetic relationship between humanbeings, technology, society, and the environment. New ways of living, of creating value, and of raising not only standard of living indicators but – what is far more important – quality of life indicators require an augmented and expanded treatment of innovation in the context of societal evolution.

According to standard usage, an *innovation* is the concretization of a practical idea that augments human capability for action with societal impact, existing as an intermediate phase between the conceptual *invention* of an idea and its marketable *diffusion* in society. As mentioned at the beginning of this article, advances in science and technology have created unprecedented opportunities for human development and well-being, and yet such advances have brought with them certain "side-effects"[19] that now threaten the stability of societies and ecosystems the world over. As illustrated in FIGURE 1, population growth, social inequities, hunger, armed conflicts, water shortages, pollution, climate change – these are but a few of the issues, each of which is related to every other, and together form a complex challenge for societal development[20]. The finitude of resources on our planet calls for new forms of production, distribution, and consumption… and for new ways of researching, developing, and innovating social and technological change in order to answer the call.

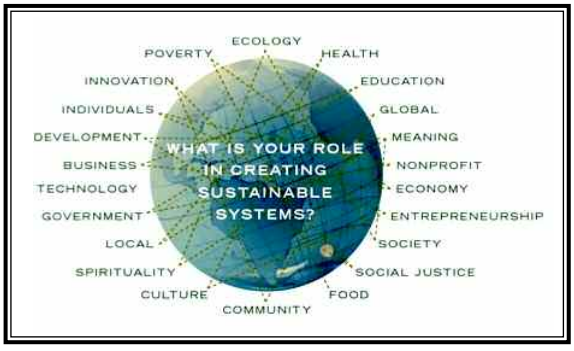

FIGURE 1 ~ *Systemic Interdependencies.*

FIGURE 2 ~ *Competencies of Evolutionary Leadership*

The emergence of new programs of research, development and innovation that seek to explore how the dynamics of healthy socio-cultural change are linked to the dynamics of innovation represents an emerging trend in higher education to answer this call. The Doctoral Program in Leadership and Systemic Innovation of the Buenos Aires Institute of Technology (ITBA) in Argentina is a case in point. Through a structured program of advanced study, the program focuses research on the set of interconnected and interdependent challenges that characterize global civilization in the first half of the 21st century[21]. Opportunities to study how these challenges directly impact, and are impacted by, the advancement of society at local and regional levels are pursued through practical fieldwork. With an awareness of how an extrapolation of the trends that characterize the current set of challenges for humanity point toward ecological catastrophe and social disintegration, researchers first develop a solid grounding in systems thinking and the sciences of complexity – allowing them to formulate explanations of why these trends are occurring – and then develop policies and strategies to innovate the means of emerging futures that are not only sustainable, but also desirable and even thrivable, as well. Clearly, there is an urgent societal need for research, development and innovation that is based on the systems sciences, and in particular, on the sciences of complexity and the study of socio-technical systems[22,23,24].

An important characteristic of future-oriented innovation is its fusion of scientific and ethical knowledge, as suggested by the notions of evolutionary sense-ability and response-ability. Instead of just answering questions of "know how," such innovative advancement in socio-technical systems must also provide the means to begin to answering questions of "know why" and "care why" in regard to the way in which we live, work, and learn together.

Ever more powerful technologies of communication and information processing have given rise to Big Data that can be transformed into Smart Data through meta-tags and evolutionary algorithms, creating not only a reservoir of extra-somatic brain power for humans, but also emerging a semi-autonomous Internet of Things. The dynamics of these socio-technical systems complexify and evolve ever more rapidly. Clearly, for innovation to be efficient, efficacious and effective, as well as ethical, aesthetic and humane, no single individual can be responsible for shaping it – some notion of *ubuntu* is essential. This is another core aspect of systemic innovation: it relies on collective intelligence. Systemic responses to the complexity of contemporary global and local challenges – personal, societal, planetary – require an expanded perspective: a way of recognizing interconnections, of perceiving wholes and parts, of acknowledging processes and structures, of blending apparent opposites. But most importantly, they require collaboration and an appreciation of reciprocity. Individual solutions and breakthrough ideas are necessary but not sufficient. Real opportunity to affect change arises from the systemic synergies that we create together. The emergence of programs of advanced research and study – such as the Doctoral Program in Leadership and Systemic Innovation – acknowledges the need to draw on contemporary insights from the sciences of complexity, computational and life sciences, and an embracive spirituality that re-instills a sense of integrity and ethical purpose in the leader and designer of systemic innovation.

LOOKING FORWARD

In his forthcoming book on *Thrivability Strategy*[25], Dino Karabeg considers how the Club of Rome coined the term "global problematique" to describe the complex entanglement of the collective challenges humanity faces at any given point in time. He suggests the need now to create "solutionatiques" – systems of shared solutions that arise from the connected intelligence of leaders and designers of innovation. To do so, he emphasizes the importance of focusing on *systemic innovation* as an ecology of

new ways of researching, developing and innovating socio-technical solutionatiques that embody social values, technological creativity, economic opportunity, and environmental integrity. Such a prospective, systemic and evolutionary consideration of ourselves as co-creators of the narrative of evolution on Earth offers us the chance to avoid being cast as the villains of evolution who – consciously or not – take on the role of planetary home wrecker. Equally importantly, it allows us to avoid an alternative narrative that would cast us in the role of the martyrs of evolution by suggesting that we should safeguard Earth and all it holds by removing ourselves from the scene. Learning to be leaders of systemic innovation in syntony with life and the life support systems of Earth is the survival imperative of our species at this point in time.

Our common quest is that of curating conditions conducive the ongoing emergence of life on earth, of ways of being responsible agents of evolutionary development while at the same time learning how to deal with the challenge of playing a meaningful role in an eco-civilization that has the potential to emerge amidst the dynamics of a rapidly changing world. This seeking of ways to become curators of life in partnership with Earth, of taking on the mantel of connectors of life with life, this is the contemporary syntony quest. As with any significant learning adventure, the process of the quest is more important than any particular outcomes to which it may lead. Through the ways of learning how to read and understanding the consequences of change that both shape and are shaped by us as agents of thrivability, we will find ways to voice our own response to the challenge of this syntony quest. Thrivable development is as much a function of our understanding of evolutionary processes as it is of our ability to engage with the dynamic change processes of which we are a part in a spirit that fosters the responsible co-creation of abundance. The systemic perspective that underlies and nurtures this understanding moves us beyond the important but limited visions and objectives of sustainable development. To curate the emergence of a glocal eco-civilization, it is no longer enough merely to seek to sustain our presence on earth. We must evolve our presence, and we must do so in the direction of collective thrivability in the context of ecosystemic abundance.

[1] BBC News 2012, Can the Dutch do reality TV in space?

[2] Roselle in Al Gore 1993, *Earth in the Balance*: 217.

[3] Ellul 1964, *The technological society.*

[4] Tornatzky 1983, *The process of technological innovation.*

[5] Laszlo 2013, *Evolutionary Development.*

[6] A glocal eco-civilization is one that celebrates and invests in local expressions of thrivability while contributing to the emergence of global interdependence.

[7] NPR 1999, *Talk of the Nation.*

[8] Kauffman 2003, The Adjacent Possible.

[9] Roy 2003, *War Talk.*

[10] Benyus 2002, Innovations Inspired by Nature.

[11] Shaw 2010, *Back to Methuselah: In the Beginning.*

[12] Seed *et al.* 2007, *Thinking Like a Mountain.*

[13] Price 2015, Daologue.

[14] *Cf.* Laszlo 2014, "Connecting the D.O.T.S."

[15] Asimov 1982, *Foundation's Edge*: 356.

[16] *Ibid*: 363.

[17] Eisenstein 2014, "Qualitative Dimensions of Collective Intelligence".

[18] *Cf.* Wheeler 2006, *The Whole Creature.*

[19] Meadows *et al.* 1972, *The Limits to Growth.*

[20] Merry 1995, *Coping With Uncertaintyi:* 78.

[21] Meadows *et al.* 2004, *Limits to Growth: The 30-Year Update.*

[22] Goerner 1994, *Chaos and the evolving ecological universe.*

[23] Capra in Loye (ed.) 1998, *The evolutionary outrider.*

[24] Pasmore *et al.* 1978, *Sociotechnical Systems*; and Pasmore 1988, *Designing Effective Organizations.*

[25] Karabeg 2015 *Thrivability Strategy.*

REFERENCES

ASIMOV, I. (1982). *Foundation's Edge* (New York: Ballentine Books).

BBC NEWS, (2012). "Can the Dutch do reality TV in space?" by Anna Holligan <http://bit.ly/1PGWgQl> [retrieved 5 July 2012].

BENYUS, J. (2002). «Innovations Inspired by Nature» in *Doors of Perception 7: Flow* (Conference in Amsterdam - 14, 15, 16 November) <http://bit.ly/1Fn8eo5> (retrieved 28 May 2015).

CAPRA, F. (1998). «Evolution: The old view and the new view» in Loye, David (ed), *The evolutionary outrider: The impact of the human agent on evolution* (England: Adamantine).

DENNIS, K. L. (2014). *The Phoenix Generation: A New Era of Connection, Compassion, and Consciousness* (London: Watkins Publishing).

EISENSTEIN, C. (2014). "Qualitative Dimensions of Collective Intelligence: Subjectivity, Consciousness, and Soul", in *Spanda Journal V*(2).

ELLUL, J. (1964). *THE TECHNOLOGICAL SOCIETY* (NEW YORK: VINTAGE).

GOERNER, S. (1994). *Chaos and the evolving ecological universe* (Langhorne: Gordon and Breach).

Karabeg, D. (2015). *Thrivability Strategy* (manuscript 27 May 2015).

Kauffman, S. A. (2003). "The Adjacent Possible: A Talk with Stuart A. Kauffman", November 9. (London: Edge Foundation) <http://edge.com> (retrieved 28 May 2015).

LASZLO, A. (2014). "Connecting the D.O.T.S. – The Design Of Thrivable Systems through the power of Collective Intelligence", ISSS Yearbook Special Issue of *Systems Research & Behavioral Science,* A. Laszlo (Guest ed.) 31:5.

——. (2013). *Evolutionary Development in Service of an Emerging Eco-Civilization*. Paper presented to the International Conference on *Social Environmental Education for an Emerging Eco-Civilization,* at the National Taiwan Normal University, Taipei, 22-23 July.

——. (2003). "The evolutionary challenge for technology» *World Futures: The Journal of General Evolution,* 59(8).

——. (2009). "The nature of evolution", *World Futures: The Journal of General Evolution* 65(3).

MEADOWS, D. *et al.* (2004). *Limits to Growth: The 30-Year Update* (White River Junction, VT: Chelsea Green).

—— *et al.* (1972). *The Limits to Growth* (New York: Potomac).

Merry, U. (1995). *Coping With Uncertainty: Insights from the new sciences of chaos, self-organization, and complexity* (Westport: Praeger).

NPR TALK OF THE NATION (1999). Broadcast 30 November, Timecode: 11min 55sec. <http://n.pr/1ADmvQW> [retrieved 7 May 2015].

PASMORE, W. A. (1988). *Designing Effective Organizations: The Sociotechnical Systems Perspective*

—— and SHERWOOD, J. J. (1978). *Sociotechnical Systems: A Sourcebook.*

PRICE, D. (2014). «Daologue», *Open to Persuasion… open reasoning in a complex world* <http://bit.ly/1HEvsXg> (retrieved 29 May 2015)

ROSELLE, as quoted in Al Gore (1993). *Earth in the Balance: Ecology and the human spirit* (New York: Plume).

ROY, A. (2003). *War Talk.* (London: South End Press).

SEED, J., *ET AL.* (2007). *Thinking Like a Mountain: Towards a Council of All Beings* (Gabriola Island BC: New Society Publishers).

SHAW, G. B. (2010). *Back to Methuselah: In the Beginning* (Auckland: The Floating Press).

TORNATZKY, L., *ET. AL.* (1983). *The process of technological innovation: Reviewing the literature* (Arlington, VA: National Science Foundation).

WHEELER, W. (2006). *The Whole Creature: Complexity, Biosemiotics and the Evolution of Culture* (London: Lawrence & Wishart).