Evolving Science and Humanity: Humanity as a Relational Ground

Dr Ayten Aydin

Civil Engineer/Anthropologist
Via Laurentina 767
00143Rome, Italy
aydin@flashnet.it

Abstract

The objective of this paper is to reflect on and search for answers to questions of how to:

- understand and cope with ever-growing and spreading worrisome world issues and problems;
- activate the human wisdom and its inherent ability for seeing the latent solutions and opportunities through the clouds of increasing complexities in all life matters, as effective internal healing tools so as to help place both scientific and human evolution on their closely collaborating right tracts.

In a nutshell, achieving a balance in all life-matters may reveal the looked for answers to above-cited questions. This in turn requires abilities for both analogical understanding and analytical knowing concerning both scientific and everyday life matters.

Within the context of the above objectives, following general reflections on the situation, inquiries are made within the four interrelated areas listed below, which directly concern the persistently prevailing human quest in the context of the modernity. These are:

- Validity of the present foundational scientific world view for the sustainability of humanity and its environment and new horizons in this vein;
- Sustainability of the present rural-urban human settlements in connection with the resource availability and use and prospects for future;
- Sustainability of the well-being of individuals and of societies;
- Support expected from academic and communication societies in the fields of formal and informal research and education and communication as well as for their wider dissemination in order to assure a sustainable future for generations to come.

Keywords: Science and technology; mechanistic and humanistic world-views; quantity and quality; optimality; complex living systems; analytical and analogical verifications; art and science collaboration; individual and societal wellbeing as the ultimate objectives

General Reflections and Where We Stand Now

(i) Review of world issues, problems, needs and opportunities in the light of prevailing worldviews and of promising resolutionary prospects

So far world issues, problems, needs and opportunities have all been reviewed, analyzed and discussed in great length. There is not much need at this conference to go into them again. But, the first and the utmost important issue today, that is worth to cite at once, is that the humanity has lost its wholeness and disintegrated into independent elements distanced from each other both within and without. Its harmony and balance is broken. Both individuals and the society are thus in a great need to re-emerge as integrated wholes, likely following a process that has repeated many times in the past, if not more drastic and with wider effects this time.

I start the reflection with a myth. In Plato's symposium, Aristophanes takes it upon himself to initiate his friends into the secret of love's power. He begins recalling the myth that there were originally three sexes: hermaphrodite, male and female. The male originated from the sun, the female from the earth, and the hermaphrodite from the moon, which partakes of the nature of both sun and earth. Each human being was a rounded whole, with four legs and four arms, able to walk upright in either direction, or to run by turning over and over in circular fashion. These original human beings were so arrogant, so insolent, and so powerful that they constituted a threat to the gods, who then debated how best to restrain them. Zeus decided that they should be bisected, and later arranged matters so that reproduction took place by means of sexual intercourse rather than by emission on to the ground, as had happened previously.

This timeless myth has been proven to remain timelessly valid story of the human quest. The history repeatedly tells us similar factual stories as the raise and fall of many civilizations, since the change in lifestyles with an initial passage from the collective and cooperative hunting and gathering for living to a settled living based mostly on agriculture and domestication of animals. This move had gradually grown into an act of dominating the nature which was assumed to be the birth right of the strong. Such ascension had then led to dissection and compartmentalization of societies eventually resulting in their total disintegration.

This pattern repeated itself again and again, based on the knowledge acquired and applied in due course without understanding the reality behind the life and living. Our own present situation in the western world, which is now spreading all over the globe, has been shaped following mechanistic theories and science introduced during the 17thcentury. These theories have also designated the human being as machine, both in thinking and acting. Isaac Newton considered the universe as a machine operating like a clock with its regularity dictated by its internal structure and the causal laws of nature. This depicts a system closed on its own and thus as if it has no environment around to think about. Thus, the whole universe became a self-contained object created by God for the God's own work.

Newton was a religious person. He believed in God and God's creation of the human being in his image. Thus the human being with this privilege could create machines like the God's creation of human being, this time to do humans' work and benefit from all

existing things around. This concept had further been strengthened with the Renè Descartes' philosophy, which implied that human being thinks and acts like a machine. This conviction reached its peak strength during the industrial revolution introduced in France by August Comte, in the 19th century. The workforce was almost like a religious belief, which exploited both material and human resources as work and machine have become the major concepts of life and living.

Human being in the process has lost many human values/virtues and replaced them with many rational reasoning and materialistic vices. Thus the concept of competition replaced the benevolence and cooperation forever. These concepts are still dominating human life and seriously limiting its wellbeing. The major dissection that the humanity is now experiencing and suffering from carries with it also its many direct and indirect side-effects. The humanity as a whole is sick now, so its environment.

The most effected from these developments is the human collective mentality, which is conducing the humanity to its collapse without its disconnected ingredients unaware of what is going on. Humanity's distorted mentality is now in great need to be corrected and its wounds healed. To make it possible, a major breakthrough needs to take place to return the humanity to its intrinsic integrity. A systemic understanding of life and living is to be realized within a relational ground maintained by healthy interconnections and meaningful communications among individuals and communities and the rest. The presently dominating and deceptive world-views and their mind-setting, purposefully created, media-support systems are major roadblocks on the way of individuals and societies to their natural maturing. They blur and confuse their sense to see clearly the impasse they are headed into and subsequently to decide how to get out of it, an act, which requires hard negotiations. This in turn requires a great inner strength and will power to win over the currently prevailing human resignation to their situation. It also blocks the road to building new societies where human beings relate to each other and to their environment with a spirit of cooperation. In such well-evolved societies it is naturally expected that helping others, fraternity and solidarity are bound to acquire new meanings as empathy and passion for the other, presently lost to oblivion.

When the human history was going through similar experiences, creative minds were emerging and intervening with their subtle tools, many times with success. Science-fictions have been more accurate than time-bound historical reports by providing a clear understanding of the hidden complex scenarios behind the actually occurring historical events, at times also purposefully distorted. A brilliant example of such science-fictions is the following.

English scholar, scientist and philosopher Edwin Abbot About (1838-1926). He mirrored eloquently the dramatic human quest around the turn of the 19th century to the20th century in his book *Flatland:A Romance of many dimensions*. During the same period, in the scientific field there was a considerable progress as a direct attempt to expand the boundaries of science beyond its Newtonian mechanistic limitations.

Abbot's *Flatland* is a two-dimensional world, which is a metaphorical synonym of the world of his own time. It is totally flat, where also the inhabitants are two-dimensional. They live in an eternally illuminated plain where no change is expected to occur, as no vertical expansion is possible or conceivable. Its intelligent inventor strictly and

efficiently applies the rules of *Flatland* within his (never her)administration. The life style described in the book reveals to us as readers the social, domestic, historical comedy of his time. The number of the sides of in habitants' geometric shapes, as lines, triangles, quadruples, polygons, etc. indicates the degree of nobility of each, which goes up to great numbers for those belonging to ecclesiastic levels. It reaches eventually up to the highest number belonging only to the inventor, but always remaining flat with no third, vertical dimension. Any attempt to increase the number of sides is considered either rebellion or illness on the part of a member of the society and as such it has to be cured or eliminated in order to protect the others: the healthy ones (!). Irregulars are to be eliminated at once. The methods used are dialectical in nature but they are to be rigidly coherent with the rules set by the inventor, who does not allow real dialogue or interaction. In *Flatland*, there is no history or if there is one, it is euphemistic. Education is self- opinionated as the rules impose. Therefore all orators, religious leaders, philosophers, doctrinists etc. are obliged to maintain the staticity of life in the *Flatland*. In away there is neither need nor room for history, and thus no need for a new dimension.

The hero of the book, being a member of Flatland, is certainly not supposed to think of another dimension. As he is a latent rebel he thinks of a three-dimensional world as he senses and gets some indications from the world outside his. He, however, does not consider it well-suited for human-life, even though a free knowledge and development is possible. For there is no consideration for others, all gains for humanity are lost on the way owing to unceasing terrorism. No healthy interaction exists. Thus, a real history cannot function as a vertical dimension for change. For the hero then a four dimensional world is only a product of a dream. He anticipates there to be other ways of communication and healthy relationships for a real growth. With this dream, he anticipates quantistic thinking and its positive effects within open systems. He dreams of a balance between the rational and the irrational as a first step for very many other dimensions to appear overtime, up to a spherical or universal dimension, that is dimensionless, where all is one and one is all. At this point, it should be remembered that this scenario depicts a century-old situation.

Already before Edwin A. Abbot, Victor Hugo in his well-known novel The Miserables demonstrated very effectively the lost balance between the rational and the intuitional, the static and the dynamic logic in human relationships. Goethe as well, almost a century before Hugo, was searching for this lost balance among the remnants of ancient Greco-Roman art in Italy, during the last quarter of the18thcentury before he decided what to do in life. His life-long monumental work Faust reveals his thoughts on dualistic phenomena that always existed inhuman behavior and which required a pact between the devil and the prophet(evil and good) dwelling side by side within the human soul with no connection if not built up intentionally.

Since their time, the world has rapidly changed with good and bad results. The humanity's survival together with its environment is at stake again. The population has nearly quadrupled in one century from 1.6 billion at the beginning of the 20^{th} century to about 6.5 billion at the end of it with all the accompanying problems of this explosion. Resources have accordingly been inequitably used and/or abused; now requiring heavy rehabilitation work supported by a wiser use and equitable sharing of resources. Human life, which was governed for millions of years by natural selection, is now almost totally

governed by artificial selection with its many consequences in the form of real and ethical problems, all requiring remedies before things go out of control. At the same time the process of human growth should not be hindered. Here again, a dualistic phenomenon is involved requiring a balanced approach.

A century has passed after the finding sand anticipations of Edwin A. abbot, but still the needs for change of a dimensional nature remain to be met. Modern science requires another level of broadening and deepening to accommodate new dimensions where the rational and the irrational find a happy modus vivendi.

The need, among others, was recently demonstrated by another science-fiction entitled: Flatland: like Flatland, Only More So written by well-known mathematician Ian Steward.(2001). The book concludes with Seen from a ten-dimensional super-manifold, it was a strange world, with the austere beauty of a page from Einstein. In fact, it was a page from Einstein, geometry made flesh. A sprawling, humming world of three-dimensional shapes stacked together along one-dimensional time: women, men, infants, toddlers, adolescents… . People, of their own kind. They lived Peoplish lives, ate Peoplish food, drank Peoplish drinks, made Peoplish love, bore Peoplish children and died (Peoplishly) in a 3+1 dimensional universe, and never thought it the least bit curious. Their relativistic space time continuum was all they could see, all they could hear, all they could feel. To them, it was all there was. As long as nothing disturbed that perception, it was true. But times (and spaces) were changing in Spacetimeland…. This is almost where west and now.

(ii) Inquiries into latent solutions

Now I turn from myth and science-fiction to the hard reality and cite here what Russel L. Ackoff, a well-known systems thinker, stated in his lecture in 1993, during the conference on 'Systems Thinking in Action'. He said: *We are in the early stages of a change of age – our worldview is transforming from one theory of reality to another. What happens to any age is the appearance of dilemmas – problems that challenge the validity of the current worldview and cannot be solved within it. Such was the case during the Middle Age and now during the Systems Age. The Machine Age was characterized by belief in complete understandability of the universe, analysis a method of enquiry, and cause and effect as a sufficient relationship to explain all…. It began to be acknowledged that while analysis produces knowledge, it is the synthesis that produces understanding. Furthermore, the Systems Age recognizes that cause and effect is just one way of looking at reality – there are an infinite number of ways*,.

Ackoff sees the solution in consciously transforming the society into a systemic civilization.We are now perhaps blowing the flames of this transformation with a greater conviction. This conviction is certainly expecting a big shift to occur in the human mentality, which has been fixed with another conviction of learning by dissecting things and analyzing them separately piece-by-piece. Systemic (wholistic) worldview, on the contrary, tends to understand elements from the behavior of the whole system of which they form integral parts. Within the domain of this wider view the real understanding takes place by peeping into interconnections and entailments occurring both inside of each part and outside of them, namely, within larger systems to which they belong. Thus,

the level of understanding of parts is increased as their entailments with larger and higher systems take place.

This worldview is neither deterministic, nor materialistic, in contrast to the world-view that has dominated the science and the whole human activities more than three centuries. It has simply reduced and is still reducing the human reasoning and understanding to simple cause and effect relationships operating with the simplified concept of the initial cause. Since then and only until recently, this kind of reasoning and acting have never been questioned, as it was believed to be the making of the Creator, as Newton himself implied. The apparent advantage of this type of knowing and reasoning is certainly its being sufficient for doing many physical inquiries, which involve easily quantifiable numerable entities and do not have to attend to complex definitions and histories of their concepts. They can easily be standardized. Whereas, human sciences deal with hard to define qualities and they lack standardization. They must attend closely to their core definitions and their referential transparency.

Scientists dealing with living organisms and thus with all human systems must specify the foundation, theory, methodology, and applications of their science. They must identify, understand, explain and validate the circular relations among their foundational properties. This requires more of an analogical understanding rather than analytical verification of the validity of the systems under review. In brief the science has to broaden its boundaries to breathe deep and long including both rational and irrational aspects of life and living without being restricted with its present rational, mechanistic and materialistic quantifiable boundaries. The narrow science is still influencing all life matters as well as peoples' thinking and reasoning, especially in the West. As said above, a major mental shift will be essential to put both the science and the civilization on a right evolutionary tract in order to save and ensure the continuing wellbeing of the humanity and its environment. This new wholesome worldview, being organic in nature is intrinsic within the constitution of living systems, thus latent there waiting for a chance to appear. A motivation now exists in terms of many symptoms, pressing needs and clear indications for a change. Latent solutions can appear in a healthy ground on their own with perhaps some impetus injected by wise, enlightened and motivated people, so as to flourish and widely spread thereafter.

At the peoples level it means acts of deep cleansing, raising consciousness and gaining inner strength to deal with the huge challenge of moving from now deeply settled competitive-materialistic-consumistic mentality to a cooperative-humanistic/organic-conservative one. At the societal level, are-growth from still available good seeds will be essential. As they mature within their circles they gradually grow by networking based on healthy and just relationships. Only then a healthy relational ground could be developed and be maintained by equally healthy communication networks. This may be the nature of the new emergent integrated societies. Only the magnitude and the nature of the societal change determine its course. The process itself can be ignited with the full readiness and involvement of its contenders. To be successful, the process has to be a self-organizing activity emulating the complex nature of living organisms and starting almost from the zero ground as if it is new beginning with clear and open minds as, where and when needed

Human Quest - Revisited

1. New horizons in sustaining humanity and its environment in overcoming the shortcomings of the present foundational scientific worldview: Emergence of the Wholesome Science

Robert B. Laughlin (a Stanford University Professor of Physics, who shared a Nobel Prize in 1998 for his work on the fractional quantum) in his book entitled *A Different Universe: Reinventing Physics from Bottom Down answers the question of where are the frontiers of science? Hesays: we've reached the end of certain kind of reductionistic thinking. We now live not at the end of discovery but at the end of Reductionism, a time in which the false ideology of human mastery of all things through microscopics is being swept away by events and reason. This is not to say that microscopic law is wrong or has no purpose, but only that it is rendered irrelevant in many circumstances by its children and its children's children, the higher organizational laws of the world. Science has now moved from an Age of Reductionism to an Age of Emergence, a time when the search for ultimate causes of things shifts from the behavior of parts to the behavior of the collective. Thus the dominant paradigm now is organizational. Nature is now revealed to bean enormous tower of truth, each descending from its parent, and the transcending that parent, as the scale of measurement increases. The most fundamental laws of physics – such as Newton's laws of motion or quantum mechanics – are, in fact, emergent. They are properties of large assemblages of matter, and when their exactness is examined too closely, it vanishes into nothing. He shows why everything we think about fundamental physical laws needs to change ... it is well within our reach.*

Sensing from his own studies within the field of semiconductors, Prof. Laughlin defines the moment in which physical science stepped firmly out of the age of reductionism into the age of emergence - that is the transition from the age of physics to the age of biology. His findings are encouraging, especially coming from a physicist not from a biologist, thus deserves closer pursuing.

I may use his statement to get close to the point I want to make here by paraphrasing it as 'moving from dealing with parts to dealing with the whole and moving from analytical approach to an analogical/abductional approach in dealing with scientific inquiries'. This new understanding will then require more *generalists* to deal with both scientific and overall life matters with a wide spectrum of knowledge and understanding that is trans-disciplinarity. Then lesser number of *specialists* will be needed to deal with highly specific matters as to support the general understanding as needed, without though taking a distance from the whole. Prof. Laughlin starts, in effect, one of his closing chapters with the following caption:

> A human being should be able to change a diaper, plan an invasion, butcher a hog, conn aship, design a building, write a sonnet, balance accounts, built a wall, set a bone, comfort the dying, take orders, cooperate, act alone, solve equations, analyze a new problem, pitch manure, program a computer, cook a tasty meal, fight efficiently, die gallantly. *(R.A. Heinlein)*

It is now time to full-fledged recognition and absorption of the broadened and deepened 'wholesome science' as a new horizon for the humanity by broadening the boundaries of the present narrow science so as to embrace more comprehensively life and sustainable living on Earth.

Wholesome Science

> I believe that Renaissance man or woman is not a peculiarity of that era, but is much more complete and representative and in a way more normal version - of humanity than modern-day compartmentalized man… You could say that modern civilization is a history of intensifying specialization; as knowledge increases, any single person's hope of grasping more than a tiny section of the ballooning sphere diminishes. That may be true of science, and is certainly true of factory labor, but I am not at all sure if it applies to art, or indeed to life live dart fully. Harry Eyres, *(clipping from the Financial Times-Weekend insert, February 20, 2005)*

In this paper, the intention is to go deeper in inquiring on the extent of the ability and the shortcomings of the modern science in dealing with systems more complex such as living systems than simple mechanistic systems. In broadening the boundaries of the modern science letting it to collaborate with art and other non-material source sit is expected to unhide a deeper and/or higher level of reality and so doing to arriving at the wholesome science, as one and integrated entity. This integration of the modern science into a broader one (wholesome science) is somewhat similar to the integration of electrical and magnetic fields. Living systems being complex and relational organizations by nature, their behavior cannot be measured by rational and tangible means. They require the support of the qualitative and non-material verifiers for validation of the aliveness of the connectivity (a communication system) existing among individual parts of the integrated whole as a network. These relations, different from material connections in the case of mechanistic systems, are non-material in nature, as in electrical and magnetic fields. Complex living systems are both dynamic and nonlinear in their internal workings and they emerge out of a self-organizing process, which assembles its parts in the form of well functioning wholesome living organisms. A non-material flexible connectivity prevailing among its inseparable parts provides the vital force required. Otherwise the system becomes ill or dies when these relations are injured or totally collapsed.

Computation methods of the classical science, including relativity theory and quantum mechanics are too narrow for computing the dynamics of such an internally and externally self-organizing complex living systems. Analysis as a method of enquiry and cause and effect as a sufficient relationship to explain all what there is, remain short for more complete understanding of life. Thus the consideration of well-suited methods becomes the key in dealing with complex living systems. The broadening the scope of the present science and expanding its working sphere to cover and even to go beyond where the art and its qualitative and subjective value judgment system operates become a necessity.

In the verification process, patterns override numbers, human inherent wisdom and intuition override the logic, irrational overrides rational, semantic overrides syntax, subjectivity overrides objectivity. Diverse forms of art such as poems, music, proverbs, stories, parodies, aphorisms, literature in all forms, films, paintings, vignettes, theatre, artistic architecture etc. come to help to verify the validity of the system concerned. In all these occurrences the human happiness remains to be the ultimate goal and the motivating factor. Science fictions and philosophical works provide useful intellectual under-grounds and metaphors in this regard and facilitate the understanding.

The major characteristics of the wholesome science could be its inherent sense of *final causation* (built-in purpose as health/survival/reproduction/harmony within and without) as well as *material, effective and formal causations* stipulated first by Aristotle. They are common to all living systems. *Similarity* among living systems, namely, all organisms (biological, ecological or social), facilitates establishing analogies and employing *analogical reasoning*, alone or in support of analytical reasoning. The *optimality* as an inherent organizational principle seeks to produce the best functioning system. This is, in simple terms, a built-in feed-back and feed-forward/early warning system for self-correcting, self-healing and regenerating from inside through its *internal predictive system*. This is the main difference between living and non-living systems where such a system is mechanical and externally inserted. The best understanding of complex systems could be made inferentially by getting fully involved and see its dynamic relational workings by being fully part of such dynamics not as in the case of mechanical systems which are studied by externally made observations. Living systems, according to Robert Rosen (1934-1998) require no identifiable initial conditions for their emergence. They are independent from rational time concept. Their state of functioning and health is qualitatively understandable and measurable by way of analogies mostly through pattern recognition. They lend themselves for self-healing through their inherent ability for *responding to conditioning* for non-material healing methods to function either to support material remedies or function on their own (Anticipatory Systems,Robert Rosen, 1985).

Looking for other means has always remained as an important thought of many scientists both those who are involved in analytical-mechanistic physics and chemistry and more so those involved in studying biological-living systems as all looked for proofs as the deciding tool for establishing the validity of their findings. This need called for the visual reasoning and deductive thinking processes to be part of the scientific inquiries. This new enlightenment has also made approachable eastern and western thought to each other in dealing with the reality. FritjofCapra covered these thoughts in great depth and with clarity in his books starting from the Tao of Physics in 1975, and deepened further thereafter.

Geoffrey Chew, a nearly 20th century American physicist had already passed over in his thought processes the threshold between tangible and intangible world. In his approach in understanding nature he thought it as a dynamic web of interrelated events, in which no part is more fundamental than other part. Nature has to be understood entirely through self-consistency. Things exist by virtue of their mutuality consistent relationships and all of physics has to follow uniquely from the requirement that its components be consistent with one another and with themselves. This view of the universe as a web of relationships is characteristic of the Eastern thought. In his theory thee is no continuous space-time.

Physicist of recent times, David Bohm's starting point is the notion of 'unbroken wholeness' and his aim is to explore the order he believes to be inherent in the cosmic web of relations at a deeper, 'non manifest' level. He calls this order 'implicate' or 'enfolded' and describes it with analogy of a hologram, in which each part in some sense, contains the whole. The whole is enfolded in each of its parts. This view is similar to that of Chew in that he views the world as a dynamic web of relations. Bohm's new scientific paradigm is a network of relationships needing neither any foundation nor any clear starting point. This is a deepest change in natural science. This also suggests that all scientific theories are approximations and they never provide a complete and definitive description of reality. Here also Chew's and Bohm's ideas meet.

American scientist-biologist Gregory Bateson's systems view of life is also similar to those mentioned above and more so in that as he fully shifts the attention from objects to relations. He views things with the mind of a biologist. According to him the whole fabric of living things is not put together by logic. He uses a metaphor in revealing his thoughts. He believes that metaphor is right at the bottom of being alive. Since relationship are the essence of the living world one would do best, he thinks, if one spoke a language of relationships to describe it. This is what stories do. He defined a story as an aggregate of formal relations scattered in time. He pointed out that logic was unsuitable for the description of biological patterns. It can be elegantly used for linear systems of cause and effect. Once causal sequences are circular (closed-loops), as in the living world. Their description in forms of logic will generate paradoxes. This is also true for nonliving systems involving feedback mechanism.

Causality involves time. When time is introduced the paradox turns into an oscillation. According to him, philosophical traditions, which have a dynamic view of reality, a view containing the notions of time, change, and fluctuation as essential elements end to emphasis paradoxes. This is the proof of the dynamic nature of reality in which paradoxes dissolve into oscillations –thermostat as his example. His most important message is that metaphor is the language of nature. It expressed structural similarity or similarity of organization. This is the way pattern connects.

Bateson's principal aim was to discover the principles of organization of this world where things get more beautiful with increasing complexity. For him mind and matter was one as the characteristic of 'living things'. Self-organizing systems is the dynamic principle of living systems and an autonomous becoming in a continuing interaction with environment. That is its order is not imposed by the environment but is established by the system itself. Bateson also emphasized that mental characteristics were manifest not only in individual organism but also in social systems and ecosystems, that mind was immanent not only in the body but also in the pathways and messages outside the body.

The one of the reliable methods to clearly understand the functioning of living systems is analogical reasoning owing to the impossibility otherwise to observe from inside, the workings of a living organism not as an observer but as an active participant. Namely, it is not practically possible to be part of the dynamics of ongoing relationships among organs/parts, while they are in their alive-states and in continuing interactions. An analogy established with similar organizations, which could be observed from within, will therefore be more productive method than studying living systems in their non-alive forms or through observations of their behaviors alone. Even if not considered to be the

main approach to apply, this method can support the analytical investigations. Bio-medical field lends itself to a study in analogy with natural social organizations, provided that they are not-sophisticated examples of social groupings.

The fuller time researcher can spend within such organizations, or could already be a member of such a society with her/his total involvement in its affairs, the more his/her finding will be authentic in telling what keeps a social system alive and functioning. An analogical inquiry requires first the identification of similar properties of both candidate systems - one as the source and the other as the target – as their major responsible ingredients which keep them functioning as a whole with an ability for self-correcting and self-generating. In that, the mechanical time ceases to exist except, in the form of aging and wearing out as a noticeable change, even so not necessarily tagged by time-sign as the measure of the change observed.

Analogy is such a strong method that it helps many unknown entities to be known, at least, understood better by transforming one characteristic from one to another to explain something missing in the chain. Scientists frequently use this method, in particular, in establishing their hypothesis, in investigating higher-level cognition and in finding new insights into thinking and reasoning. They also use analogy in designing their experiments learning from similar internal workings of other systems. This bond is stronger than any others between biological and social organisms. This is the superiority of the wholesome science over the narrow modern science in terms of coverage. The latter has, however, its valid specific role to play in dealing with non-organic systems - rational/mechanistic systems.

Figure 1 below illustrates the main properties of the wholesome science containing within its boundaries also those of the mechanistic narrow science as its integral part.

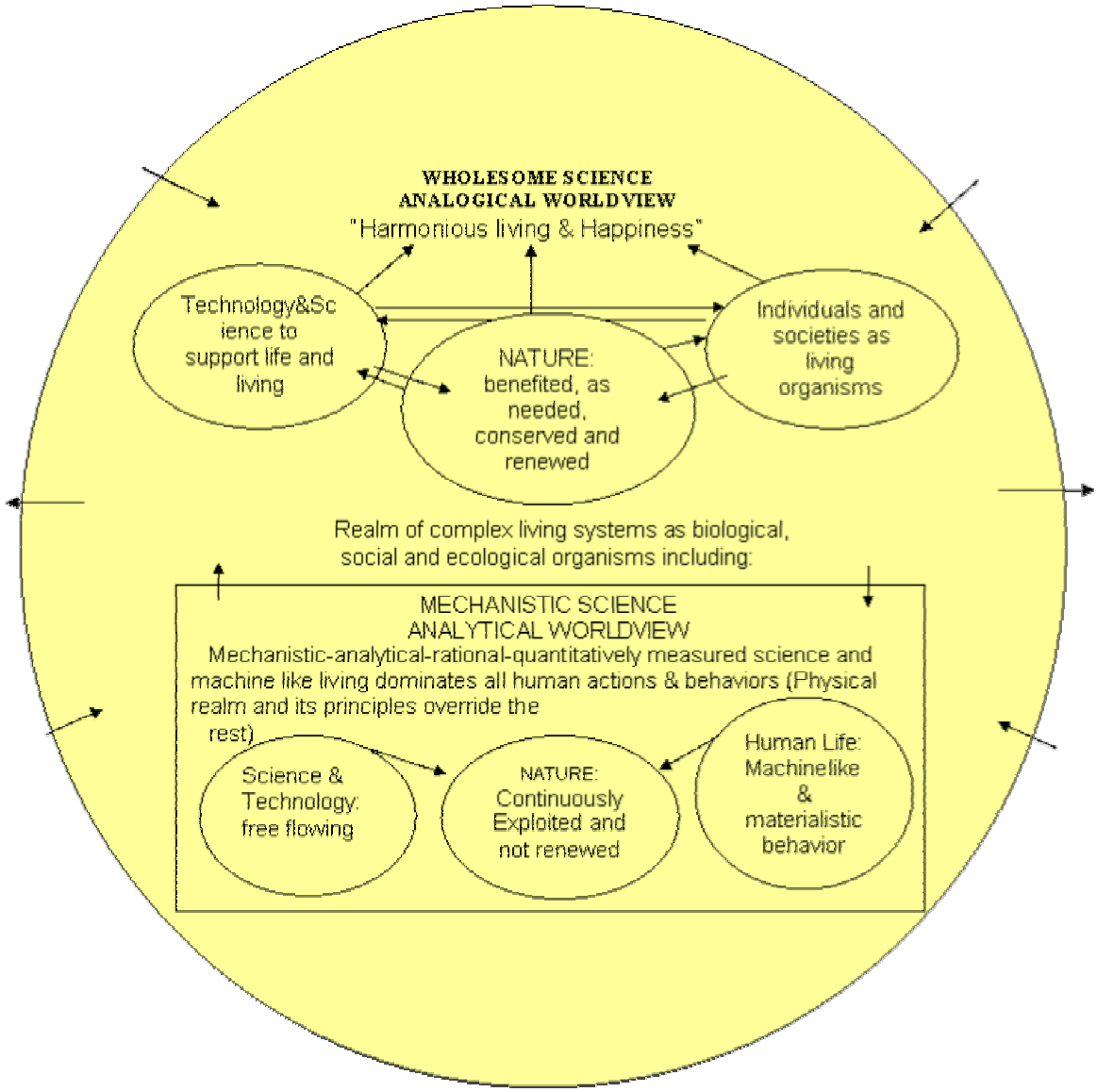

Figure 1: Wholesome Science

2. Sustainability of the Present Rural/Urban Settlements

Dust as we are, the immortal spirit grows
Like harmony in music; there is a dark
Inscrutable workmanship that reconciles
Discordant elements, makes them cling together
In one society. *(By William Wordsworth)*

All life and living problems of human groups had always been accentuated with the passage of nomadic way of living (hunting and gathering, supported in time with animal husbandry activities) to a settled way of life as briefly touched above. The history had witnessed many rises and collapses of civilizations mostly related to the lost balance and weakened life-supporting relationships within and between the rural and urban settlements. They were also exacerbated by a gradual specialization with differing quantifiable values attached to them which had brought with it an unnatural hierarchy and power structure built mostly based on material wealth.

In the process and at the end of civilization collapses, almost always the rural webs disintegrated. This situation-in recent times- is accelerating with such a speed and magnitude owing to artificial migrations motivated by materialistic aspirations. This phenomenon is occurring in a speed and magnitude that the humanity has never experienced before. Its dimension is now affecting adversely the Planet's healing ability. Its natural carrying capacity is being stressed also owing to the population explosion during the 20^{th} century rising from 1.6billion at the beginning of the century to 6.0 billion at the end as against a figure around0.5-0.6 billion in recent previous centuries. This growth has considerably deteriorated the balance between rural and urban living and the opportunities for the life-supporting mutually beneficial complementarity and resulting integration are lost. Those, who are attracted to or directed to go to urban areas, are mostly motivated by materialistic ends and needs which, in many instances, purposefully blown-up to support materialistically growing economies of a number of countries. In this process there is no room for a concern for the exhaustion of world-wide resources and more importantly for the loss of their capability for natural renewal. In many instances, the latter has been boosted by applying measures to increase productivity, including replacing manpower with mechanization with naturally and socially harmful side-effects in medium or long-term.

Mechanization has also played its so-called negative role by heavily entering into industries, which had once absorbed migrating people from rural areas as manpower. It now makes them increasingly redundant. All these briefly summarized happenings now depicts a picture of a rapid destruction of human-web in rural areas and growing misery and uncontainable anger of those moved into and remained in urban areas, but staying at the periphery of the well-to-do part of the society in all respects. This has now become the reality of the present and alarming signs of the humanity's future. Efforts for top-down globalization has further accelerated this fragmentation which has now grown into so far unheard of dimensions with a quasi-total destruction of human values and solid relationships among people. These were the main building blocks of the sound human-web built throughout the ages in spite of many vicissitudes not always so pleasant. We now tend to slide towards a total societal disintegration, it will certainly deteriorate further, if we do not consciously revert this tendency towards an upward trend so as tore-emerge from the ashes so far created thanks to the still living life-force existing therein. Namely, thanks to a number of small healthy human groups still existing or newly created throughout the world who are living self-sufficiently or deliberately closed within their relatively closed-sustainable webs of life waiting for the time for a healthy metamorphosis.

Beginning Again

> Hope is not the conviction that something will turn out well, but the certainty that something makes sense, regardless of how it turns out *(Vaclav Havel, Czech Playwright and Statesman)*

Networking appears to be an effective way of changing the societies in a realistic way starting from the peoples themselves and linking them self-organizingly with others as they mature. This way all segregated and distanced units may again integrate based on a spirit and action of cooperation. This may be a new beginning within the old one moved from inside where everything functions in relationship with others.

Creating a new society through auto- regeneration of the old is a complex process similar to the emergence of life itself. It builds up by weaving the whole texture cell-by-cell, organ-by-organ as a functional whole. Its stability depends on the ability for sustaining the harmony within the whole that in turn, depends on the health and the strength of the connectivity among its integral parts. This resembles to the functioning of the immune system of living things. For this reason alone human system cannot be treated as a machine and as a simple system. It cannot be reduced into its parts without killing the whole. Fragmented parts can never be put together to produce the same whole as the added value produced by the very act of organizing based on harmonious relationships can never be repeated again as before. This is the heart of the matter and illustrates the big difference between the mechanistic and systemic-wholesome worldviews.

Necessitated by the decline of the materialistic and mechanistic life-styles which is still though infecting also the old world through globalization efforts imposed from the top, new kind of self-organizing web-like societies are gradually emerging as a natural response to the growing human unhappiness as world-wide self-organized grids. They emerge from and supported by smaller wholistic networks as their life-forces empowered by courageous moderators. Their existence is certainly making a controlling effect on the spread of imperialistic political and market forces all over the world. But the still ongoing world-wide competition promotes the continuing birth of new globalizers and controllers in capitalistic form at the same time. Good will and perseverance are needed to find a dynamic balance between these two opposing looking developments. Once its achieved and maintain its dynamic and nonlinear nature, both sides will benefit and com-penetrate for the good of all.

At the local and at the level of individuals the growing economic difficulty and resulting human unhappiness and apparent brutalization of life-environment mostly in large urban centers are paving the way for many, mostly those previously emigrated from rural areas or from small towns to search for new horizons. They tend to return to smaller, humane and environment friendly urban and/or rural lifestyles when and where possible. Also the people who were not attracted to immigration to cities or to industrial centers with the desire of obtaining material wealth and remained in their original urban or rural locations now clearly see the graceful advantages of small life-styles. Such developments need to

be promoted as long as they are spontaneous. The newly acquired understanding of the need for a mental-change and will power to act accordingly, will certainly encourage and support advancement of this process.

In this evolution and in there-emergence of natural life-styles it is the dynamic harmonious organization based on healthy connections among their building blocks (individuals or groups) counts rather than assembling otherwise lifeless ingredients and trying to keep them together. Here there is a great analogy between the human and social organisms and their ability for the formation of antibodies against damaging destabilizing internal and external viruses/forces. There are good examples of harmonious small human settlements, which give a ray of hope for anew beginning out of hopeless-looking picture of the world-affairs and sad human life as well as for the emergence of a better future for the generations to come. These examples, which are recently visited by the author of this paper are Cinque Terre in Italy and Safranbolu in Turkey. Both are registered by UNESCO as the World Heritages and conserved with care. The pictures of these two different harmonious living samples speak for themselves.

The first is a group of five coastal villages on the northwest of Italy, near La Spezia, with a population varying from 500 to 2 000 in each village. They live in unison and cooperate in many ways in the form of agriculture, wine-producing and highly developed tourism. All five are connected with walking paths, by train and by the see and also with the nearby towns and most importantly with the cooperative spirit of their people. The other is a town in the northwest of Turkey–once an important center on the Silk Road- with a very friendly population of 33 000 spread in three parts of different socio-ecological zones. It is a settlement area carries the basic characteristics of the traditional Turkish social life within urban scale, and which protects it in its environmental setting. People there live in harmony. I'll finish this part of the paper with the following write-up, which, appears on a board placed in the Hidirlik View Pointat the highest location in Safranbolu, which is frequently visited by local sand foreigners. This statement may as well be a motto for all future urban settlements of human dimension.

> Most of the works present in the town date back to the Ottoman Period of the 17th, 18th,and 19th,century. First became famous with its Traditional Turkish Houses. Safranboluhas a highly developed urban culture. In the formation of the town, aesthetics and functionality combine in a most ideal way. Nature-human-house relations, street-square-shopping center relations, and relations among neighbors have developed in an excellent manner. In this town, which was founded without being bound to any development plan, none of the houses shut the view of another house, neither does any house runs counter to its architecture. In Safranbolu the view is shared equally. Brown and white colors, windows, bay-windows (cumba), cobbled streets, roofs covered with mission tiles, ceiling decorations, pools, usage of stone and wood with amazing mastery are only some of the attractions inviting you into an immense culture In Safranbolu where many a beauty is hidden in details. Please protect it and give support to its protection.

These examples may not only be good models to study and learn from, but they provide inspiring realities next to those artificially and inhumanly grown towns and cities tore-imagine and accordingly to re-organize themselves into similar healthy living organisms growing into greater networks. Some people presently living in large cities may also have the inspiration, courage and willpower to return to rural areas tore-create similar human-webs and to build good relationships with others and with urban-webs. People living in such well-functioning relational grounds will see the benefits of established and growing harmonious relationships among the many unquestionably appreciate the importance of maintaining such inter-connections forever. They will also realize that no isolated soul survives for long, without relating to others and creating web-like living organisms resulting in more powerful and sustainable wholes.

While this recipe applies to the human system as a biological organism, it also applies to the society as a socio-organism, to nature as an eco-organism, to everything elsewhere human beings are involved. Building a healthy rural-urban balance will also require the functioning of the same principle. All these groupings are complex living systems, which are to be understood and treated as such. They are parts of an integrated whole as a web within which a life-force travel and suitably intermingled them. Without this life-force and continuing intermingling they will die sooner or later by exhausting their both internal sources and external resources with no energy left for renewing what is used up.

The sketch below illustrates the idea of how human beings can live in different layers be it in rural or urban areas, as extended vertically or horizontally by aspiration, choice, talent or by necessity. Regardless the form of their life-extensions, they can stay integrated and complementary to each other, keeping their freedom, equal importance, mutual respect and collaborative spirit within the society of any size, be it a family, village, town, city, country, continent. etc. They may live in the form of a rural or urban settlement, always though dependent in varying degrees on each other both qualitatively and quantitatively. Every unit has its noble place and role to play in such groupings and all need each other and need to remain responsible for a healthy maintenance of the whole.

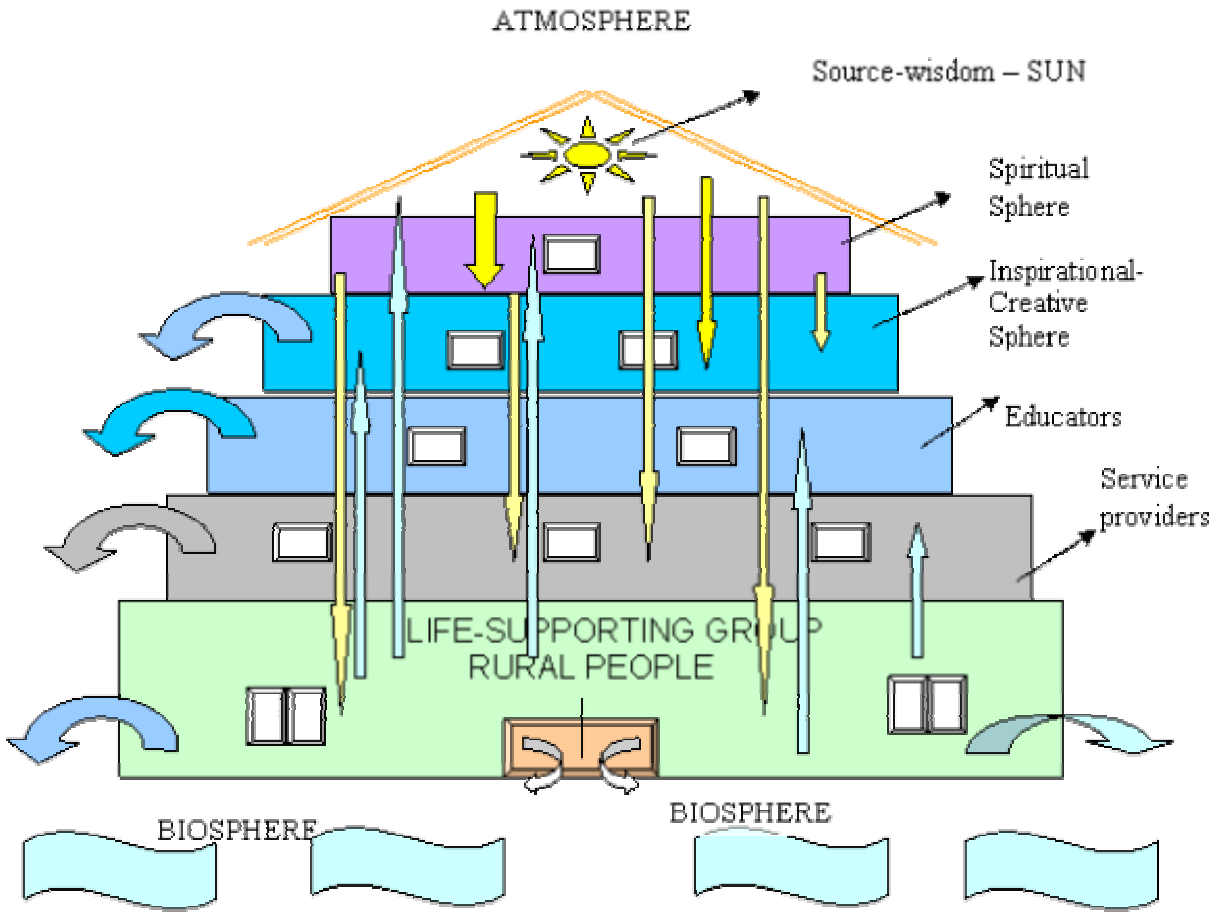

Figure 2: Harmonious Living

Opinions of a few well-know thinkers in support of integrated and web-like human groupings are briefly cited below:

E.F. Schumacher in his book entitled *Small is Beautiful: a study of economics as if people mattered* even written in 1973 seems to reflect present day problems and needs perfectly well as in the following excerpts:

- For constructive work, the principal task is always the restoration of some kind of balance. Today, we suffer from an almost universal idolatry of gigantism. It is therefore necessary to insist on the virtues of smallness where this applies. For every activity there is a certain appropriate scale, and the more active and the intimate the activity, the smaller the number of people that can take part, the greater is the number of such relationship arrangements that need to be established. What scale is appropriate? It depends on what we are trying to do. The question of scale is extremely crucial today (as said in 1973), in political, social and economic affairs just as in almost everything else. Take the question of

size of a city. While one cannot judge things with precision, I think it is fairly safe to say that *the upper limit* of what is desirable for the size of a city is probably something of the order of half a million inhabitants. It is quite clear that above such a size nothing is added to the virtue of the city. In places like London, or Tokyo, or New York, the millions do not add to the city's real value but merely create enormous problems and produce human degradation.

- -Millions of people start moving about, deserting the rural areas and the smaller towns to follow the city lights, to go to the big city, resulting in a pathological growth. In the United States, sociologists are studying the problem of 'megalopolis'. The word 'metropolis' is no longer big enough. They freely talk about the polarization of the population of the United States into three immense megalopolis areas. One is from Boston to Washington, a continuous built-up area with sixty million people; and one on the West Coast, from San Francisco to San Diego, again a continuous built-up area with sixty million people; one around Chicago again with sixty million people. The rest of the country being left practically empty; deserted provincial towns, and the land cultivated with vast tractors, combine harvesters, and immense amount of chemicals. We like it or not this is the result of people having become *footloose*; it is the result of the mobility of labor. This picture may or may not describe today's situation, but it certainly represents the tendency, which is now spreading in the world.
- Everything in this world has to have a structure. Otherwise it is chaos. Before the advent of mass transport and mass communications, the structure was simply there, because people were relatively immobile. There were communications; there was mobility, but no footlooseness. Now, a great deal of structure has collapsed, and a country is like a big cargo ship in which the load is in no way secured. It tilts, and all the load slips over, and the ship founders.
- One of the chief elements of structure for the whole of mankind is of course *the state*. And one of the chief elements or instruments of structuralization is *frontier*. Economist fought to such frontiers becoming economic barriers – hence the ideology of free trade. But, then, the people and things were not footloose, transport was expensive enough so that movements, both of people and of goods, were never more than marginal. Trade in the pre-industrial era was not a trade in essentials, but a trade of precious stones, metals, luxury goods, spices and – unhappily – slaves. The basic requirements of life had of course to be indigenously produced.
- The movements of populations, except in periods of disasters, was confined to persons who had a very special reason to move. Now everything and everybody has become mobile. All structures are threatened, and all structures are vulnerable to an extent that they have never been before. …. The simplest things, which only fifty years ago one could do without difficulty, cannot get done anymore. The richer the society, the more impossible it becomes to do worthwhile things without immediate pay-off.
- While people believe that fast transport and instantaneous communications open up anew dimension of freedom (which they do in some rather trivial respect), they

> overlook the fact that these achievements also tend to destroy freedom. They make everything extremely vulnerable and extremely insecure, unless conscious policies are developed and conscious actions are taken, to mitigate the destructive effects of these technological developments.

This is the picture describes the human quest at the beginning of the third quarter of the 20th century. I would paraphrase the ending words of Schumacher as 'everything in this world has to have a structure. Otherwise it is chaos.' by saying yes both individually and communally as well as environmentally we need a structure. But it must be flexible and revisable as needed while respecting and keeping foundational human values intact as the essence of aesthetic properties of all material and non-material things. Similarly, established ethical-behavioral rules are also to be revisited as needed to reflect newly emerging needs of maintaining peace and harmony within communities and the world at large. This should, however, never be at the expense of human rights, equality and freedom. To maintain the sustainability of societies, in particular of a harmonious rural-urban complex living, as our subject in this chapter, the balance once achieved between them, to be realistic the people have to learn to live with right doses of both chaos and order to be in a constructive relationship. In a harmonious rural-urban complex this relationship may mean continuous inter-penetrating: *A Creative Chaos and Emerging Order*. This may also be applied to all matters concerning the survival and the sustainability of the Planet Earth. It may mean a real democracy.

In many respects similar to the views of Schumacher, Herbert Girardet, in his book Creating Sustainable Cities-1999, (one of Schumacher briefings) already stated in the beginning of his book that *our present way of life in the developed countries is at the cost of others' ability to develop*. He adds that there are 600million people living in urban areas in developing countries - many live in poverty, suffer from pollution levels we would never accept, have insufficient waste management, inadequate provision of water, sanitation and drainage, their lives and health are under continuous threat.

The forces of everyday politics try to push us away from complexity and integration towards (seemingly simpler) sectoral approaches. He says large cities, not villages and towns, are becoming our main habitat. We are about to enter the urban century. There will be no sustainable world without sustainable cities. In this connection he asks: *Could big cities ever be sustainable*? His answer is no, as they do not follow the Culture of Sustainability. He calls for a return to cities as centers of civilization, not of mobilization. For this he says we need vision and hope.

He sums up by saying that *historically most cities grew and prospered by assuring supplies of food and forest products from the surrounding countryside, harnessing the fertility of their local hinterland. This is true of medieval European cities with their concentric rings of market gardens, forests, orchards, farm and grazing land, as well as of many cities in Asia, where this practice continues even in the face of rapid modernization. Future cities can learn a great deal from this model even if we cannot simply transplant traditional practices into the 21st century unchanged*.

On the positive side he suggests way in looking into cities, like other assemblies of organisms, with a definable metabolism, consisting of the flow of resources and products through the urban system for the benefit of urban population. He also suggests that given

the vast scale of urbanization, cities would be well advised to model themselves on the functioning of natural ecosystems, such as forests, to assure their long-term viability as the nature's own ecosystems have.

At times a product may be a powerful integrating element between traditional values and modernity, between small-scale operations and large-scale enterprises, and between rural people and urban settlers, between producers and consumers and so on. A good example is the growing grapes and producing wine. The recent documentary film *Mondovino* of Jonathan Nossiter presents the ongoing adventure of wine producing across three continents in a fascinating way. Here is and excerpt from the cover page of the DVD:

> Mondovino weaves together the family succession sagas of billionaire Napa Valley (in Sonoma) power brokers, the rivalry of two aristocratic Florentine dynasties and the efforts of three generations of a Burgundian family fighting to preserve their few acres of land. Wine has been a symbol of Western civilization for thousands of years. Never has the fight for its soul been as desperate. Never has there been so much money –and pride – at stake. But the battle lines are not what you'd expect: local versus multinational, simple peasants versus powerful captains of industry. In the world of wine –it is never the usual suspects.

It speaks out well of one sector, which can be expanded to many others to find hints and clues useful in the emergence of integrated enterprises and societies with human face.

This is, in effect, a circular metabolism in which every output is discharged by an organism, which in turn becomes an input to renew and sustain the continuity of the whole living environment of which the starter is a part responsible for the success and failure.

3. Sustainability of the well-being of individuals and societies

> It is only through beauty that man makes his way to freedom *(Friedrich Schiller)*

The Art of Sustainable Living

Sustainable living both of an individual and of a society depends on the degree of the integrity of individuals and the communities they form a part. Living as such is a complex system and thus keeping its integrity, which is a continuing functioning in harmony with internal and external forces, in a complex process, takes place within a framework where both material and non-material properties communicate and interpenetrate. All organisms being complex relational organizations by nature, their behavior cannot fully understood by rational and tangible methods. The state of their health is directly correlated with the health of internal relations and their being alive to stimulus.

Thus it is not the health of individual components but that of the whole indicates whether all is doing well or not. This is also valid for the well-being of an individual, of a community and of their life extensions including where they live, work and spend their leisure times. Corollary to what is said by now, well-knitted organisms also entail in the workings of their higher systems and help keep them healthy and alive. This is also true other way around. A healthy community inspires happiness and well-being to all its integral parts. This is the essential relational ground for sustainability of the society where the quality of communications is an essential property.

Individual element is the building block of the whole. All starts from the internal wholeness of each single element. This means the physical, mental and spiritual health of individuals. These three realms are also very much interrelated. A total health could then be achieved when a harmony among these three basic realms and their healthy interactions with the higher systems they belong to and the whole outside world, occur.

Most of present illnesses could be correlated by the ills of the society, which deeply underlie the collective mentality and consciousness. In many cases people with or without realizing submit themselves to maladies as an escape. Curing the society will have to pass through the present blinding side-effects of the mechanistic-materialistic world view where only the number is the measure of all values. It is the global pathology. Its cure has to start from a level where peoples' minds and souls are first cleansed of the old (modern analytical and quantitatively verified worldview) and then re-shaped not only to know but also to deeply understand what is going on and hence to chose freely for themselves (post-modern wholesome worldview).

This has to be a self-organizing process. It may, however, need an initial impulse, often appears as a result of a strong personal disappointment or an important illness of the self or a love done etc., and willpower and sacrifice to give up likely present or potential benefits of the ongoing materialistic system. It requires a strong challenge to ignite the rest. It will really be a new beginning with anew awakening to the new reality. Aesthetic properties of nature and creative works of artists are important triggers in this respect.

Creative works do not carry a direct message. They, however, directly or with the help of technologies used for their realization and through other means awaken the human sensibility. It is an act of personification of human vices and virtues. There is an essence imbedded within their fluid substance that transmits aesthetics substances. It is the prime mover of the human sensibility. It fertilizes the ground for human beings to sense and distinguish the good from the evil, beauty from the brute, harmony from the conflict, cooperation from the competition, benevolence from the greed and thus peace from the war. The histories of art and also of science provide us not only information and knowledge, but they make us deeply sensible and wise to understand, why one kind or another type of science and art are create din a certain time in the human history.

Aestheticcomprehension as a facilitator

Internal conflicts may emerge from (a) a one-off external menace to which one cannot respond directly and immediately. Human being may, however, react passively by

internalizing it for a period of time, then respond to it creatively; (b)accumulated soul-unfriendly experiences causing psychological discomfort, eventually growing even into depression and requiring external help of one kind or another. In both cases, a creative response in the form of works of art and any other similar soul soothing experiences may alleviate or resolve the suffering.

This kind of creative works, at times, make a wider impact on those who are under the same kind of pressure. It works in a way that disturbing effects of above-cited experiences are counter-balanced by aesthetic comprehension perceived through art and the like; nature itself standing in the first place among major sources of such properties.

It is believed that both aesthetic comprehension and internal conflict resolution occur at the human sub-conscious level. The healing comes out of the com-penetration of internally produced and externally presented aesthetic properties. As a result, an aesthetic comprehension is reached and an inner peace is sensed. By talking about establishing closer links between science and religion; art and science; religion and nature; nature and the rest, it is meant going to the source where all their essences meet and from which all are nourished and created.

This is the level where a lasting reconciliation may also be expected to take place. It is the level once touched, things will self-organize as where understanding and acting are integrated, requiring no interference or assistance from outside. An individual has all these faculties in one body, mind and soul. If, therefore, s/he is adequately nourished from this common source, his/her life itself becomes a harmonious work of art. Aesthetic qualities are abstract in nature and they are only perceived by human sub-conscious, in terms of authentic feelings such as beauty, love, goodness, confidence, compassion, sorrow.

These abstract qualities present themselves as the quintessence of art, natural objects or scenes. They also exist in man's faith systems at its sublime spiritual level as well as within metaphysics as the supreme science. These properties are perceivable directly by certain rare human beings, which have exceptionally high degree of ability to penetrate into sublimity. This is a level beyond the reach of many. They are also within the metaphysical dimension of science, which is similarly within the reach of only a few scientists who can abstract more truth from the source than others, beyond the narrow boundaries of the modern/narrow science. The following figure schematically illustrates such tangible and intangible perceptions, which help individuals to raise their consciousness.

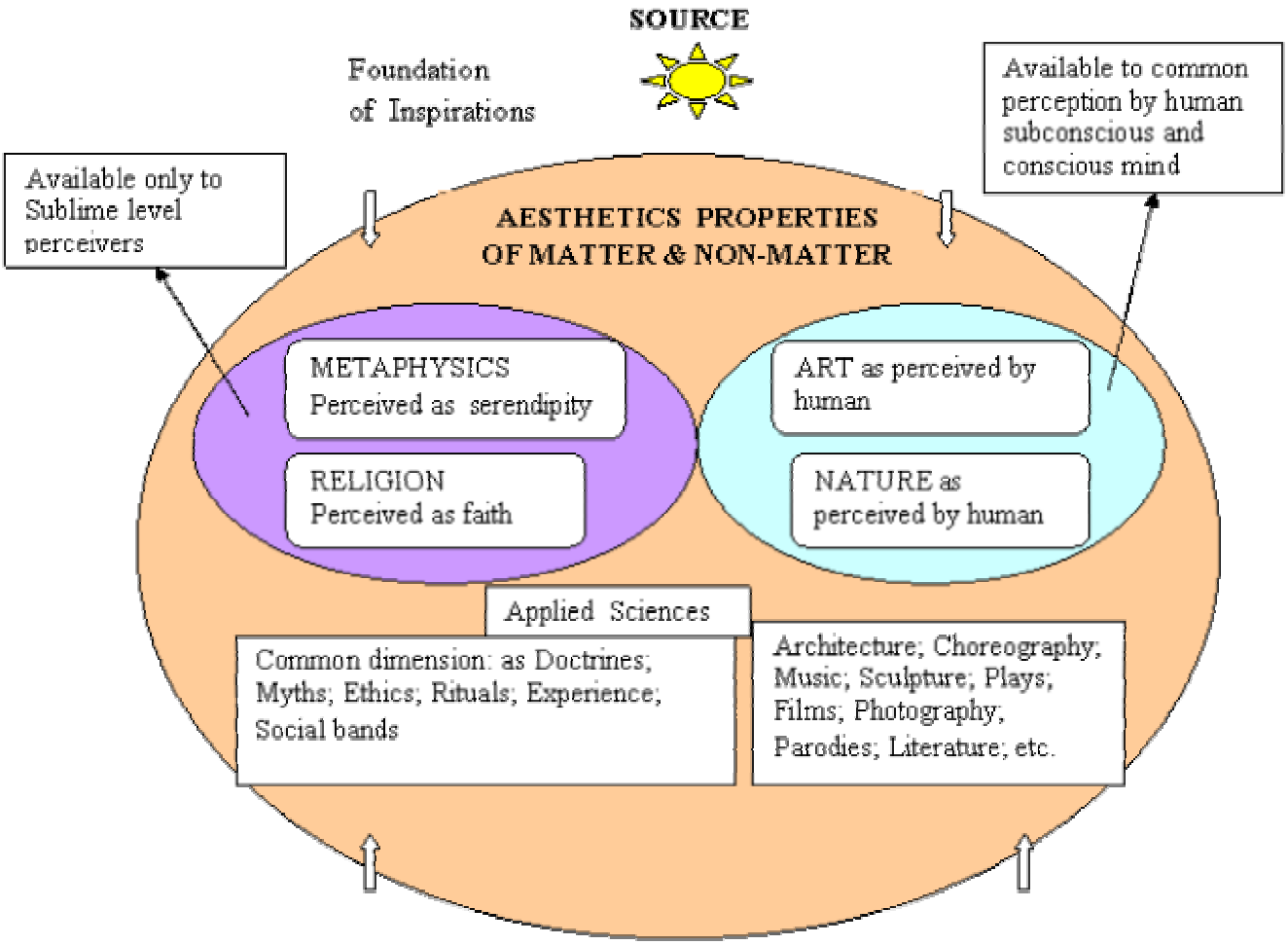

Figure 3: The art of Sustainable Living

4. Support expected to come from academic society, artists as well as well-intentioned people in the fields of formal and informal research, education and communication as well as for their wider and effective dissemination

So far in this paper, three inter-related subjects have been dealt with in connection with prevailing world problems, issues and resolutionary prospects. These three basic areas, with their integral and inter-related parts as a whole, form a complex living organism intermingling with each other within a circular communication system. Altogether, they also interact with the external environment. Enhancing students' and indirectly the whole society's ability for aesthetic appreciation, raising consciousness and capacity not only for learning, but more importantly for understanding as a process of neural connectivity are to be the major concerns of academic research and education communities. They, in turn, form integral parts of the circular communication system functioning as apart of the entire human life extension imbibed with various social issues. It is the proper functioning of this circular communication system, (illustrated in the figure below) will create the necessary condition in which with the positive entailment of material elements

(section 2) and non-material elements (section 3) the required mental transformation will take place towards adopting a broader worldview (section 1). This wholesome worldview is, in turn, expected to continuously strengthen and support the functioning of the circular communication system and thus maintain the health of the life-producing connectivity therein.

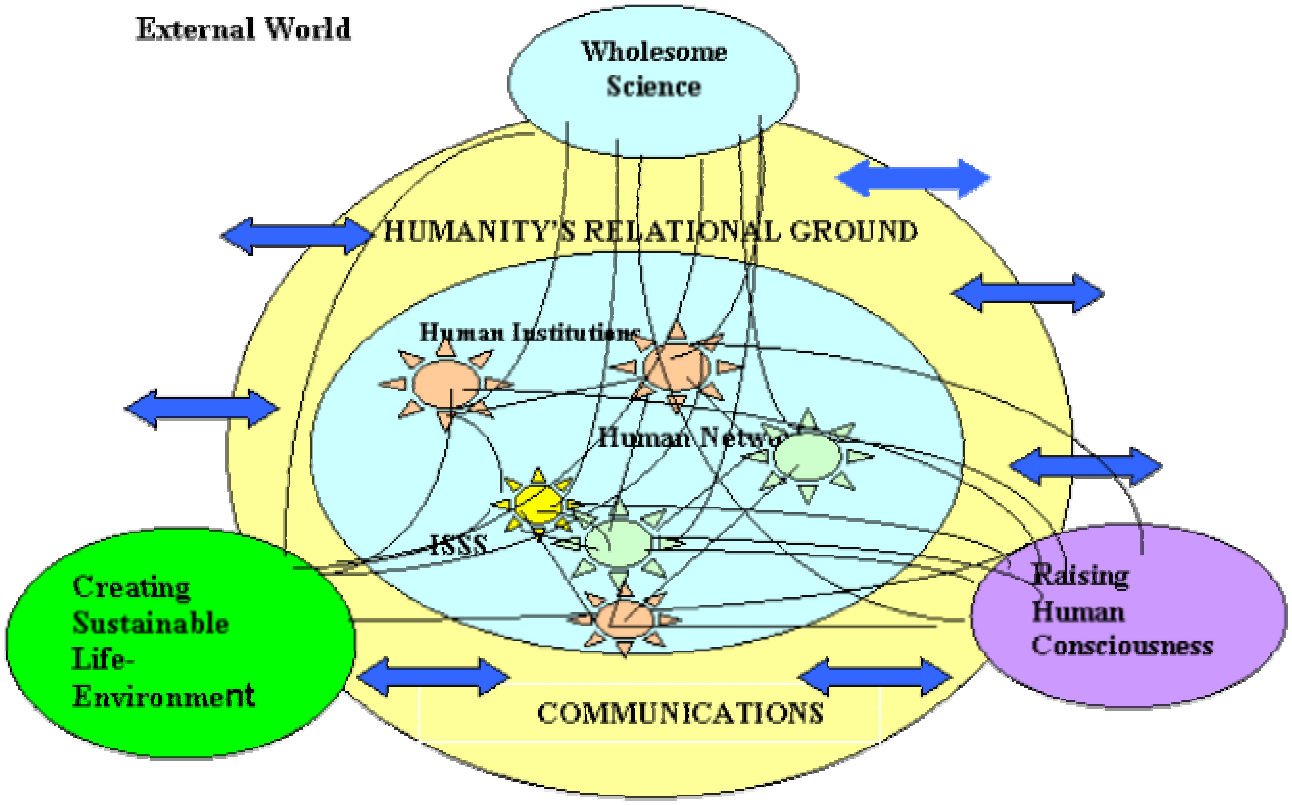

Figure 4: Humanity's Relational Ground

Concluding Remarks

The role of academic institutions operating within the context of the new worldview will be more of learning mediators or focalizers who produce theories and support research and societal transformations as a self-organizing process. In a way they will provide relational ground for the forces freely interact and help new ideas and creative works emerge. Academicians should fulfill their mediator role not only guiding students but also producing literature including science-fictions to express many theories and ideas through analogies, metaphors, stories to facilitate the learning and understanding capacities of wider public, in turn enhancing their own understanding and their role in the new society. There also comes into the scene works of artists and artisans who with their awe-inspiring

works help the humanity to break its boundaries to see the beauty, appreciate the good and feel the grace of benevolence and sense the benefits of love and respect for others

We are certainly still away from this unrealistic looking picture, but not completely. Certainly, the effects of the present narrow and mechanistic worldview will not easily disappear partly because people are still tied up to it for their day-to-day livelihoods and partly it has heavily invaded peoples' mental processes and even their spiritual concepts. Moreover, the properties of the new worldview will not easily penetrate and produce the expected results in a short time. The new way of thinking and acting will require to be well assimilated. Some deliberate efforts will have to be made by courageous, sincere and benevolent people. It requires lots of sacrifices, perseverance and solidarity by all in every aspect of life. This will be a missionary and visionary work. During initial years the world needs people who have such qualities. We have to be hopeful and patient but incessantly active also by building networks of well-intentioned people and by correcting ourselves individually and collectively as needed on the way towards a better world.

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