ON SCIENCE OF METAPHORS AND THE NATURE OF SYSTEMIC REASONING

VUK USKOKOVIĆ
University of California, San Francisco, California, USA

Scientific method is presented not as a means for investigating a true and objective character of universal reality, but as a metaphorical tool applied for mutual co-ordination of experiences. By acknowledging the co-orientational and metaphoric roots of science, religion, arts, and ordinary linguistic communications alike, potential for their fruitful interdependent application becomes apparent. References to the paradigms of constructivism and objectivism are drawn in parallel in outlining the tracks along which the proposed concept of co-creation of experiential qualities is arrived at. Systemic reasoning based on analogies between different levels of complexity of natural systems emanates as an imaginative aspect of creative thinking.

KEYWORDS: Cognition, constructivism, metaphor, objectivism, pragmatism.

INTRODUCTION

The essential ideas that comprise this article have been developed as a form of response to an evident neglect of the philosophical issues throughout the standard courses of contemporary scientific education. It seems as if the majority of modern students and young scientists do not care much to ask and deepen some of the fundamental questions about science, and are instead instigated to leave behind all uncertainties and relinquish their naturally inquiring mind so as to follow a programmatic and predetermined flow of the evolution of knowledge. The premises of objectivity thus tend to be accepted on the basis of superficial and often literal understanding of scientific representations. Yet a good and virtuous education presents the basis for the development of human knowledge, values and creativity.

The path of this article consequently takes us to a quest for the treasures hidden within the foundations of science.

Address correspondence to Vuk Uskoković, University of California, 707 Parnassus Avenue, San Francisco, CA 94143-0758 USA. E-mail: vuk.uskokovic@ucsf.edu

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SYSTEMIC REASONING AS AN INHERENT ASPECT OF NATURAL THINKING

When it is evening, ye say it will be fair weather for the sky is red. And in the morning, it will be foul weather to day for the sky is red and lowring. O ye hypocrites, ye can discern the face of the sky, but can ye not discern the signs of the times?

Matthew 16:2–3

Induction and deduction present two essential aspects of logical reasoning, which has been the implicit foundation of scientific and technological progress of human civilization. Besides them, abduction is usually regarded as an additional form of logical thinking (Fischer, 2001). It was conceived as a more faithful representation of natural thinking where neither implicit premises nor final conclusions remain permanently fixed, but are instead subject to regular examinations and modifications so as to find the best fit with the experiential occurrences. However, despite its inherent feedback between conclusions and premises, abductive reasoning presents just another chain-like and essentially logical form of thinking. And as Henri Poincaré noted, “Pure logic could never lead us to anything but tautologies; it could create nothing new; not from it alone can any science issue” (Hong, 2005). In this work, another aspect of natural thinking, in form of the so-called systemic or metaphoric reasoning, will be presented. In simple terms, it can be described as a way of linking various segments of parallel layers of logically (i.e., sequentially) connected ideas into meaningful patterns.

But before proceeding to the discourse of metaphorical nature of science and language, and the merits of systemic, analogous reasoning, let us first mention the main flaws of induction and deduction as the basic forms of logical inference.

In the framework of logical reasoning, a given deduced explanation is accepted as valid if it is “true”; and if the premises are true, the conclusion deduced out of them would be “true” as well. However, the price paid for establishing such a “verifiable” criterion of truth is that the whole informational content of a respective system of knowledge as well as all new discoveries are implicitly comprised within the initial presumptions. Due to its redundancy, it can be used only as a logical method of explanation and a pointer to the mechanisms of described processes, but not as a method for reaching new fundamental scientific concepts.

In case of inductive reasoning, premises comprise observed relationships, whereas a conclusion derived thereupon relates to a general case. However, such reasoning naturally leads to the empirical “induction problem,” according to which although induction can expand one’s knowledge base, it does not necessarily support the criterion of truth. Because historically, in finite number of cases confirmed explanations do not necessarily imply their future validity, it has often been said that “science never proves anything.”

Furthermore, each induction does not represent a neutral, non-interpreting, and unprejudiced classification upon objectively collected data, but rather depends on subjective interpretational abilities shaped by implicit beliefs and ideas. Peter Medawar held an opinion that “the inductive format of the scientific paper should
be discarded ... scientists should not be ashamed to admit ... that hypotheses appear in their minds along uncharted by-ways of thought; that they are imaginative and inspirational in character; that they are indeed adventures of the mind” (Medawar, 1963). This clearly suggests a key role of analogies and metaphors in the process of creative scientific reasoning. Heisenberg meant a similar thing when he wrote that “it is absolutely not true that only logical thinking and comprehending and application of affirmed natural laws are important in science. In fact, imagination plays the crucial role in the kingdom of science, and that particularly holds for the natural science. Because, even though a lot of serious and careful experimental work is needed for gathering the facts, the very arranging of the facts becomes successful only if a man knows how to approach the phenomena with his feelings rather than mind” (Heisenberg, 1969).

Imaginative use of analogies can be regarded as a creative act that underlies the development of all scientific representations. In fact, all such representations may be identified as containing certain metaphors derived from the abstractions that are typical to human mental reflections. The choice of imaginary aspects of human reasoning becomes, on the other hand, inspired by typical perceptual constancies and their experiential evolution, and as such—comparing to strict and rigid links of induction and deduction—provides cognitive sprouts for an endless evolution of the scientific thought.

**PERCEPTUAL AND COGNITIVE CO-CREATION OF QUALITIES**

Reason can grasp only what it brings forth in accordance with its own design

Immanuel Kant (Kant, 1781)

In order to better understand the roots of metaphorical nature of every cognitive stance as well as the subsequent necessity for inauguration of systemic reasoning as the crown of creative thinking, I shall start with describing the cognitive basis for emanation of elementary experiences, named herein as “co-creation of qualities.”

As far as the current attitude toward cognitive phenomena is concerned, two major paradigms may be discerned. The first one belongs to the empirical tradition of scientific observations, according to which human experiences present faithful, directly corresponding representations of perceptive impulses of an outer, objective world. Perception is described as analogous to the passive detection process in which cameras form images of the outer world. An eye that sees the world may be accordingly considered as a passive detector of eye-independent, objective natural processes. In other words, as Aristotle proclaimed, there is “light” in the world, but not in the eye itself.

On the other side, there are constructivist theories of cognition, according to which all the details of one’s experiential domain are formed through personal assimilation of a uniform sea of surrounding impulses into meaningful wholes. Emphasis in explanation of perceptual and cognitive processes, altogether with the responsibility for the state of the world as the subject sees it, are herein thoroughly shifted from outer circumstances to the epistemological core of the subject’s being.
“Light” of the world as an ontological phenomenon is not explicitly referred to in radical constructivist worldviews, whereas in accordance with the opinion held by Plato and the preclassical Greeks (who did not make semantic distinctions between the concepts of “eye” and “light”), there ought to be a “light” that eye “shines” to the world.

Many experiments have provided a substantial amount of evidence in support of the thesis that the eye or any other sensual organ does not have passive roles of directly representing patterns of light or any other environmental impulses upon the subject’s tabula rasa cognitive substrate, but are actively included not only in selection of absorbed impulses, but in their reshaping and adaptation to the cognitive needs of the subject being (Lettvin et al., 1968). Human eye coupled with the corresponding neural patterns defines the perceptive elements of environment as well as the pathways of the perception. Classical theories of passive sight are today increasingly being replaced by the theories of proactive sight, according to which the sensual dynamics plays a key role in explaining the world as we see it. Beside the fact that conscious shifts of attention between perceived experiential details may provide a rough evidence of the role subjective interest plays in perceptual construction processes, it is nowadays known that it is not only intensities, but primarily local variations thereof (thereupon, beings can sense only differences) on the surface of retina that stimulate the optical nerve. Saccadic eye movements that during observation continually shift the position of light-sensitive retina cells in relation to an optical image present a consequence of such an ability of biological senses to detect only differences as information. The existence of an imperceptible “blind spot” at the position where the optical nerve protrudes retina—so that we do not see that we do not see—presents an elegant example that suggests that a subjectively constructive aspect of perception needs to be acknowledged in all comprehensive cognitive models.

Instead of comprising classical computational “inputs” and “outputs,” a neural system is in the course of its active biological correspondence with the environment exposed to continual structural perturbations that only modify and stimulate, but do not predetermine the patterns of activity of the neural network itself. Neural system could be, therefore, considered not as a mere filter for mapping the objective reality, but as an active and semi-autonomous co-creator of a unique experiential world in itself. Focus in investigation of perceptual phenomena should, accordingly, not end with references to external initiations of internal structural perturbations, as has been the classical research trend in cognitive sciences and conditioning experimental approaches of behavioral psychology. Many fallacious consequences of behavioral approaches to understanding cognitive phenomena could be overcome accordingly, including: (a) the ideas of attaining fruitful educational accomplishments by means of pure conditioning (i.e., rewarding and punishing) and mechanistic “instillation” of knowledge; (b) the insistance on external and visible manifestations of life as sufficient for judging about its internal patterns (i.e., emotions, tendencies, ideas); (c) the idea that perceptual stimulations as seen from the perspective of an external observer and of the subject being are perfectly equal.
According to constructivist theories of cognition (Foerster, 1973; Maturana and Varela, 1987; Glanville, 1990), learning involves assimilation of ostensible perceptual constancies in terms of topographic similarities and temporal repetitions, and their fixation in forms of objects, qualities and their complex harmonies with an aim to improve the subject’s level of coordinative stability of movements. In aiming to establish orientation and movement stability in its experiential world, a child learns how to maintain specific apparent perceptual differences as constant as possible, so that it may create a viable, stable and controllable relationship with its environment. Each being can be correspondingly regarded as a continual co-creator of its own world of experience, despite the fact that such nature of experiential formation becomes normally forgotten later in life when objects of the world start to be seen as pregiven.

An opposite direction of adaptation comparing to the Darwinian is inherent in the hypothesis of personal shaping and modification of “surrounding” physical qualities. Namely, whereby modification of the biophysical structure of an organism as a consequence of the need to adapt within an actual set of environmental constraints is considered as Darwinian adaptation, constructivism defines perception as an inner force that autonomously outlines permanent qualities of the experiential world in order to accomplish their harmonious assimilation within the cognitive capacities and conscious concepts of the organism. However, by accepting the relevancy of both the objective view wherein organisms adapt to environmental limitations, and the constructivist one wherein environmental features of experiential world adapt to physical structure, cognitive abilities and phenomenological intentions of the organism, mutual, co-evolutionary adaptation as an elementary aspect of creative relationships is acknowledged as immanent in every co-creational instance of the development of one’s experiential world.

Whereas objectivistic attitudes may be justified by easily verifiable existence of similar and “shareable” experiential aspects, constructivist stances are supported by the fact that each particular biological structure has a specific cognitive “view of the world,” producing unique and unrepeatable perceptual experiences at every instance of its living. In fact, each detail of one’s experiential world comprises both common and “objective,” and unique, personally constructed aspect, so that the conflict between constructivist and objectivistic worldviews might be solved by referring to their mutual, inter-subjective phenomenological dependence. In other words, there may be both “light” in the world and “light” in the eye, whereby the intersections of these two “sources of light”—that represent the domains of “objective” natural reality and subjective epistemological backgrounds, respectively—give rise to every form of experience.

**PHILOSOPHY OF THE WAY**

All real living is meeting
Martin Buber (Buber, 1923)

Each particular cognitive structure coupled with nonrecurring environmental stimuli brings forth unique perceptions and perspectives at each instance of its
existence. Individual perceptions and the subsequent stream of reflections are partly determined by the ontological reality that the subject is immersed into, and partly by the subject’s unique epistemological and biological bases. Instead of either objective experiential reality detached from the nature of observer or the multiversum of solipsistic worldviews detached from the “common grounds” of experiential phenomena, an inter-subjective nature of cognition may be depicted as innate to human existence.

Systemic problem-solving approaches tend to reach long-term solutions by invoking not unilateral reinforcements, but balances between the opposite effects. This is why the co-creational balance that intertwines subjective and objective experiential aspects presents only an instance of the broader Philosophy of the Way. As each way indicates simultaneous existence of connectedness and separateness (as it serves to connect entities that are supposed to be separated at the first place), it can be emblematic of the quests to attain balances for the sake of more profound reasoning and acting. Another related metaphor could be the one of music, which is due to its existence only through alternate moments of approaching and distancing of particular nodes. Music arises from oscillating entities that neither approach each other too closely and unite, nor derail and permanently separate.

The co-creational character of perception may be, therefore, represented with the following principle:

Each Quality is a Way

Every perceptual boundary as primary cognitive information may be realized as coming into existence through a co-creational “touch” between a being and an underlying ontological reality. Each existential moment may be considered as the one carrying endless potentials for “inner” and “outer” progress of being and environment, respectively. Each existential moment may also be considered as a unique moment of spiritual learning and evolution of a being through the co-creational correspondence with ontological foundations of Nature. Each detail of one’s experiential world can be regarded as arising out of the communication between the deepest spiritual qualities of the subject being and God.

Numerous other dynamic balances, such as conformity/novelty, order/freedom, knowledge/intuition, guidance/adherence, and originality/mimicry, may be recognized as analogous to the dynamic subjective/objective equilibrium proposed herein. However, the most significant ethico-aesthetical and creativity-fostering balance that can be derived from the co-creational standpoint presents an ambivalent balance of self-responsibility, meditative inwardness and introspective passionate-ness on one side, and empathic, extroversive, and compassionate blending with the worldviews of others on the other side. The two comprising attitudes that may be identified as respective emanations of the two major Christian commandments (Mark 12:29–31), present reflections of the dialectical syllogism of distancing and approaching, detaching and merging, identity-growing and identity-blending, through which emergent synthetic levels of beautiful, cosmically reverberating harmonies are formed. However, an overwhelming significance of the cognitive balance that transfigures the extremes of sadistic authoritarianism and manipulative
“tyranny” on one side, and masochistic irresponsibility and inert submissiveness on the other (Fromm, 1956) is too broad to fit the content of this article.

Instead of the notions of “discovery” and “revelation” applied within objectivistic paradigms to describe novelties at the level of scientific and theological explanatory schemes, respectively, the concept of “invention” is used to describe the same process in constructivist models of experience. However, mutual creativities of ontological features of the world and epistemological attitudes of the being inherent to the co-creational thesis suggest that invention and discovery are merged in each creative cognitive act. The same inextricableness of “interpretational” and “representational” aspects may be confirmed as valid in case of every perception, reflection and description. The prospect of comprehending intrinsic, observer-independent qualities (that would correspond to Kant’s things-in-themselves) of any natural system may be from this perspective characterized as futile as the search for anything that would come out of “one-hand clapping” of the famous Zen koan.

Biological structures are not able to perceive anything that is not a sensual difference. Cognitive information may be, therefore, described in terms of differences in the primary perceptual experiential substrate, and correspondingly regarded as the line of intersection of two otherwise imperceptible sections. On the basis of such an idea of dual creational sources as implicit in emanation of every cognitive information, many incongruences in human understanding might be resolved. Mental and emotional isolation induced by relying on objectivistic or solipsistic epistemological backgrounds could be transcended by recollection of the co-creational idea that where there is one creational side of the world’s being and becoming acknowledged there must be another one immanent as well. In simple theological terms, this means that if there is God acknowledged as one creative side of the world’s becoming, there must be human spirit as the other creative side as well, and vice versa. In their co-creational encounters, experiential worlds come into existence. Such a stance was famously overseen by Schopenhauer who, drawing on the metaphorical imagery of Hindu religious tradition, pessimistically observed the world of his experience as a passive and inert “mirror” to inner aspirations (named as “free will”) of his being (Schopenhaur, 1840), instead of an endless “touch” between his “free will” and the divine and supervising power of Nature on the way of the being’s spiritual evolution.

The co-creational perspective implies that indeterminacies and uncertainties present inevitable aspects of any cognitive scheme that pervades the natural order. Neverending quests to reveal the hidden foundational traits of the creative sides involved in the co-creation of one’s experiences prevent the wheel of evolution from stop spinning. One of the key existential paradoxes can be now illuminated: only searching after the fundamental questions that have no permanent answers can keep cognitive systems in balance on a continuous evolutionary walk along the tightrope of conscious experience (Laszlo, 1987). An important observation in relation to such, “tightrope walking” balance is connected to the fact that only through alternate falling toward complementary sides one can maintain the trend of continual advancement along the line, whereas permanent stabilities would correspond to sterile standstill positions.
Because induction-derived, generalized knowledge could not be seen anymore as of perfect and subjectively unconditional validity, every form of knowledge could be regarded as an emanation of faith, that is, of our beliefs. “The things that I know, I believe in,” were the words of Ludwig Wittgenstein (1951), whereas William James said that “true is the name of whatever proves itself to be good in the way of belief” (James, 1907). Vulgar transformations of believing attitudes to certain ones imply an unnatural, robotic idea of technical prohibition of mistakes, even though we know that mistakes present unavoidable steps on the pathways of learning and evolution of every biological organization. Every natural, wise, and inspiring idealization ought to possess implicit acceptance of natural uncertainties. The key to fruition of beauty in our thoughts, movements, and worldviews is in accepting natural uncertainties and encounters with spiraling harmonies between periodical recurrences and surprising novelties. One of the most important challenges of the modern era is learning to be certain in uncertainties, to have faith in unverifiable knowledge and subjective “guiding stars” in its evolution, to learn to present ideas always in a new manner and in new resulting forms, as well as to stimulate blossoming compromises between inevitable logical constraints and metaphorical freedom in human patterns of reasoning.

Cognitive and communicational guidelines that have been evidenced as beneficial in long terms and broad contexts may in general be typified not by inherent accentuations of individual poles included in the problematic polar confrontations, but by an emphasis of the dynamic maintenance of their harmonious and productive polar relationship. Consideration of experiential details as fruits of the communication between the spiritual core of the subject being and ontological foundations of Nature (i.e., God) may similarly lead to the balance of cognitive open-mindedness and spiritual satisfaction as a prerequisite for creation of the pathways of informational progress of being/environment co-creational interfaces. Consequently, learning about the epistemological pathways of one’s thinking would enrich the being with the knowledge of ontological features of the world, and vice versa. As a result, inquiry over the co-creational threads that stretch between the deepest epistemological aspirations of beings and hidden features of the underlying natural order may present the basis for profound theological outlooks of modern times.

**SCIENCE AS A METAPHORICAL TOWER OF KNOWLEDGE**

It is the glory of God to conceal a thing; but the honour of kings is to search out a matter. The heaven for height and the earth for depth, and the heart of kings is unsearchable

Proverbs 25:2–3

In accordance with the proposed co-creational nature of primary experiences, scientific concepts derived thereupon could no longer be regarded as universal representations of an objective reality. Rather, they may be accepted as metaphors,
that is, humanly derived concepts applied in mutual coordination of human experiences.

A few examples may be given of finding metaphorical inspiration for inventions/discoveries of solutions to various problems from the history of science. Albert Einstein came to the idea of modification of physical qualities of an observed system as it approaches the speed of light in relation to certain observational reference frame while moving away from Bern’s clock tower in a tram (Kaku, 2004). Descartes arrived to the idea of Cartesian coordinates while watching the flies buzzing in one of the top corners of his room (Glaserfield, 1995). Archimedes reportedly realized that the volume of an irregular object could be calculated by measuring the volume of water displaced when the object is submerged in water while he was taking a bath. As the story goes, he ecstatically jumped out of his bathtub and started running and yelling “Eureka” through the streets of Syracuse. These and similar “Eureka” moments in the area of human quest for knowledge present nothing but sudden metaphorical leaps between different levels of logical representation of natural phenomena. The revelations of sages, prophets, and genii of human civilization have been seeded with such sudden, enlightening arrivals at magnificent ideas which would be used later as invaluable guidelines in numerous areas of humane creation. Thomas Kuhn previously referred to these enlightening and logically untraceable sources of inspiration as the complementary pathways of arrival to novel scientific ideas in relation to logical rules of reasoning, in the course of his elaborate historical research of scientific “paradigms and revolutions” (Kuhn, 1969).

Despite the fact that the use of metaphorical reasoning is strongly rejected in most areas of science, scientific communications would be literally empty without the use of metaphors. Not only picturesque representations of molecules, atoms and subatomic “particles,” but the very mathematical concepts that underlie the postulated principles of physics present metaphors of the “modeled” experiential reality. Beside their evident significance in rational processes of developing novel scientific ideas and concepts, metaphorical leaps between logically disconnected (or at least unforeseeably connected) levels of conceptualization are, nevertheless, regularly regarded as intolerable mistakes in the realm of scientific reasoning. However, in certain scientific fields whose objects of research are pervaded with complexities that prevent scientists from adopting standard investigation methodologies that dominate the physical sciences, narratives are routinely applied in the research practice and stimulated throughout the corresponding education. Ecology presents one such example among natural sciences, although numerous social sciences, including anthropology, sociology, and psychology, are currently witnessing strong incentives toward freeing themselves from the legacy of positivistic methodology and acknowledging the importance of narratives in the domain of scientific practice. It is important to note that such incentives might be in most cases identified not as attempts to ruin the long tradition of empirical research in science, but as the means to reach improved understanding of the method of science in general, as well as to attain the level of clearer, more natural and faithful and, thereupon, more inspirational forms of scientific presentations.
Numerous scientific concepts, including “evolution” and “homeostasis”—let alone the quasi-physical metaphors of “force,” “energy,” “tension,” and “power” applied in social sciences—were derived through analogic inferences. The whole field of systems theory and what is today called “the systems approach” deals with such generalized concepts and relationships that can be applied in the context of qualitative characterization of a variety of natural systems. In order to mitigate the trend of excessive employment of simple-minded and purely empirical methodologies in the research areas of complex biological, physiological, and social systems that are governed by immeasurable emergent qualities, the merits of systemic reasoning should be signified.

Philosophical systems throughout the history of human civilization were far from being insusceptible to employment of analogical relationships. A particularly impressive example is Hegel’s analogous correspondence between the dialectical method as the accepted basis of epistemological evolution of knowledge and the same method assumed as inherent in ontological evolution of being and life. According to the latter, the initially omnipresent monistic Nature as a dialectical thesis divides “to form observer/observed dichotomies” into a multitude of beings, entities, and perspectives as a dialectical antithesis. Eventual realization of the all-pervading unity of being and recognition of one’s “absolute spirit” as reflected in each experiential detail invokes an enlightening synthesis whereby the being becomes one with the world, inducing novel evolutionary aspects of the natural order to arise. “Spiritual development is abandoning one’s self, detaching from it and yet reverting to it. . . . Absolute spirit is the one who from eternal and self-identical being becomes other to itself and that other recognizes as the very self” (Weischedel, 1966), Hegel claimed in support of this metaphysical idea, which had previously resided in the ancient Hindu concept of division of the ontological world to Brahman and Atman who were, according to the Vedic scriptures, to become united in the final stages of one’s spiritual evolution.

A few examples may be provided in order to illustrate that even the empirical tradition of conventional science has not been perfectly immune to analogical inferences. In general, whenever a descriptive or explanatory reference to observer is lost in favor of an objective representation of scientific data, a logically forbidden jump from the level of epistemological statements, inherently related to the subject’s experience, to intangible and directly imperceptible level of ontological relationships is performed. Besides routine popular scientific misrepresentations of physical events, many other serious epistemological-to-ontological analogical “leaps” can be found as deeply ingrained in modern scientific interpretational attitudes. Quantum wave function as an epistemological superposition of all possible states of an investigated system has, for example, frequently been presented as an ontological quantity, irrespective of the observer’s reference frame. Einstein-Podolsky-Rosen experiments have been employed for the purpose of evidencing indications that an observer might correlate the states of infinitely distanced particles, not necessarily implying thereby that the particles may become mutually influenced at the moment of observation (i.e., wave function “collapse”), as has
been proposed in the models of ontological non-local physical effects (Bohm, 1980).

Adoption of inherent uniqueness of each cognitive system presents a spontaneous invitation to approach a novel form of tolerance and fosterage of blossoming diversity of opinions and worldviews. As a consequence of fundamental epistemological adoption of the co-creational nature of experiences, a prolific fosterage of educational tolerance and productive balances between self-responsible individual creativities and adherence to the supplied “guiding stars” might gradually take place of objectivistic interpretations of human feelings and cognitive patterns, and subsequent manipulative communicational attitudes arising from the objectivistic assumption that creatures passively absorb information they become exposed to. Whereas divine human qualities may gradually disintegrate as supported with either solipsistic or objectivistic cognitive foundations, their natural blossoming may be envisaged in the cognitive world pervaded with the knowledge of wondrous threads of the “guiding voice” of Nature as incessantly posed as responses to the subject’s deepest aspirations in their mutual, co-creative outlining of the patterns of the experiential world on the way of the subject’s ethico-aesthetical learning and advancing toward the Hegelian moment of spiritual synthesis and becoming “One with Nature.” Instead of being sustained in isolated states of epistemological panic or boredom, immanent in the cognitive worlds of either constructivist solipsism or objective representationalism, from the epistemological bases of co-creational nature of experiential phenomena one would run out to see how the world looks from the eyes of the other, and would yet get back to one’s own eyes tremendously wiser and wholer.

The proposed Philosophy of the Way is in concert with the key role of changes of perspectives in every systems approach, in a way that besides approaching and blending, timely distancing and derailing presents another aspect of appropriate learning about the encountered systems. The cosmological concept of time may, as a result, be deduced from the idea that Nature and its cognitive “sub-systems” need to continually shift perspectives in order to avoid being caught in “blind spots” of intangible epistemological propositions and attitudes. Systems approach is all about changing perspectives and viewing the investigated systems from as many perspectives and organizational levels as possible, and eventually discovering analogous “patterns that connect” diverse domains and relationships into meaningful systemic wholes. “Break the pattern which connects the items of learning and you necessarily destroy all quality,” Gregory Bateson (1979) wrote in definition of the beautiful concept of “pattern that connects,” and inherently suggesting that every type of learning occurs through metaphorical comparisons and perceptions of similarities between various distanced natural systems and domains.

Accepting scientific and religious descriptions of the world as true representations of an objective reality, rather than pragmatic and ethical narratives, respectively, has caused tremendous tragedies throughout the history of human civilization. The roots of appearance of numerous intolerant fundamentalistic
attitudes throughout the history of human race may be correlated with oppressive propagations of individual ideas as universal and objective truths. The consequences of identifying written knowledge not as sets of contextually shaped, ethically and pragmatically co-orientational metaphors, but as images of an objective and universal reality have ranged from the persecution of Christ and Inquisitional torture of “heretics” to contemporary fundamentalistic religious intolerances and subtle but additive antagonistic effects related to ordinary communicational references to superficial behests or formulations whilst forgetting the importance of cultivating implicit vows at the epistemological “bottom of one’s heart.” In that sense, it is important to keep in mind both Heinz von Foerster’s imperative that “truth is war” (Thyssen, 2003), and Alfred Korzybski’s proposition that the “map is not the territory.” In accordance with the “common sense” observation of words and linguistic constructions as imperfect reflections of emotions and meanings that one attempts to convey to others, the audience should always be aware that they should not “bite one’s finger off,” but look for the landscapes that it points to.

It is highly convenient to form an analogous correspondence between map and its territory on one side, and science and the objects of its inquiry on the other. Just as a map presents a set of useful co-orientational guidelines, science comprises coded directives for mutual coordination of human experiences. This is because from the pragmatic point of view the value of scientific concepts is estimated by the effectiveness of their utilization for the purpose of mutually evolving the face of the planet and inner human sources of inspiration and worldly impressions. Then, in order to communicate in unison, both people communicating around the map and within the scientific society need to be equipped with the basic knowledge that provides conditions for co-orientation and coordination of experiences.

Not a single map could have all the implicit assumptions denoted, so that the meaning of its constructor perfectly matches the one of the reader. “$1 + 1 = 2$” would present a mathematically meaningless statement had previously defined concepts of numbers and mathematical operations not been implicitly acknowledged, whereas if one contemplated on how far he could advance in decoding Morse’s code by the sole means of Morse’s code the knowledge on why participation in objective and non-ambiguous communications is both theoretically and practically impossible should dawn on him. Just as an incessantly novel construction of a map in which the existence of this very map of a territory needs to be acknowledged ought to be performed in order to satisfy the criterion of perfect mapping (note that Gödel’s incompleteness theorem may be depicted this way), and just as an infinite array of calibrations of calibrating instruments is required to perfectly calibrate the primary measuring instrument and satisfy the ideals of perfect measurement (note that “weak” Heisenberg’s uncertainty principle may be depicted this way), a perfect definition of one language would require all of its implicit characteristics to be explicated by means of another language, which would again pave the way for an infinite explication array. Just as rainbow cannot be touched because it moves together with the observer, implicit assumptions could never be completely explicated, because there is no neutral perspective from which they could be described as
objective patterns. This brings us to the need to modify the objective nature of language.

**CO-ORIENTATIONAL CHARACTER OF LANGUAGE**

Don’t bite my finger, look where I am pointing

Warren McCulloch (Foerster, 1995)

The objectivistic assumption that meanings of linguistic assertions rest solely within themselves is analogous to idea that scientific descriptions can be expounded and applied without any reference to the observer. Accepting language as an objectivistic tool springs from the Aristotelian idea of feasible establishing of criteria of truth for every language expression. Despite the fact that interpretational contexts in general define qualities of observed systems, their elimination is a requirement for applying composition and decryption rules that aim to reach and transmit the “true” character of “objectively” described experiential features. However, the guidelines such as “context is the mother of content” (Lumley and Dodds-Taljaard, 2000) or McLuhan’s “medium is the message” may still ring in our heads, reminding us that the process of creation of meanings is inherently dependent on semi-subjectively applied interpretational contexts. The classical hermeneutical idea that truthfulness of any linguistic assertion is immeasurable (due to implementation of initial assumptions that are being continually re-created by the utilization of the same language) may be thus accompanied by the observed impossibility of satisfying the criterion of truth due to subjectively interpretational and metaphoric character of all perceptions and cognitive reflections.

In order to illustrate the co-orientational nature of language, Winograd and Flores (1987) offer an example wherein person A asks person B if there is water in the fridge. If person B by water means chemical composition attributed to water, even if there were no drinkable pure water in the fridge, he may say “yes,” thinking about molecules of water adsorbed on food packages, or circulating within the cooling coils. Therefore, it is not only meanings of the words that could not be expressed independently of the context of particular communication (defined by aspirations of the communicators), but each linguistic communication requires a ceaseless cultivation of sincere implicit tendencies to understand other beings and create responses that may orient them toward the “right” way. Exclusion of co-orientational aspirations in ordinary communications is equivalent to paralyzing potentially creative effects thereof as well as degrading basic human qualities and responsibility-bearing relationships in the long run. Comparing to individually centered comprehension of meaning in the objectivistic frameworks, language and understanding from this perspective obtain a socially centered character, and consequently transcend the immanent solipsistic dangers of inevitably subjective interpretational character of the processes of perception, reflection, acquirement of knowledge and communication. The starting points of constructivist theories which maintain that “everything said is said by observer” could be thus complemented with von Foerster’s imperative that “everything said is said to an observer”
Languages could accordingly be comprehended not as a means for objective representation of the world and experience, but as pragmatic conceptual frameworks applied for the purpose of mutual co-orientation toward common and compatible meanings, and consequently as a means to mutual upbringing of implicit, aspirational, and inspirational creative essences of human beings.

Because language as a communication tool in large extent modifies subjective thinking patterns, each reasoning process may be attributed with semantic backgrounds that have been spontaneously formed through the subject’s existential immersion in a specific social tradition of communication, behavior and understanding. Appreciation of the social character of language makes it possible to overcome potential autistic incompatibilities in communication and expand the reference scope of one’s comprehension in language towards embracing the overall historic tradition of the actual society behind the subject’s cognitive and rational upbringing. Each type of knowledge may accordingly be considered as neither completely subjective (i.e., independent on social and biological backgrounds of one’s cognitive origins) nor thoroughly objective (i.e., independent on subjective interpretational aspect), which presents one more reason in favor of conjoining the extreme standpoints of constructivist and objectivistic philosophies in a “middle Way” concept of co-creational organization of experiences.

Many debates might be transformed from conflicting and discordant to productive and harmonious through propagation of the idea that meanings related to linguistic expressions are not universal, and that every reference to absolutely true descriptions of natural phenomena implies certain arrogancy (Kuhn, 2002) that cuts through many potential co-orientational links that may be fed only by a constant influx of mutual trust and confidence (Kordeš, 2004). By accepting language as a tool for mutual co-ordination of experiences, phrases and clichés that were spontaneously formed through their repetitive use may be transformed into sincere and genuine assertions and body expressions.

The relevance of parables in scientific practice and common reasoning might be naturally acknowledged as essential with the transition from the objectivistic apprehension of language to its denotation as a co-orientational pragmatic tool applied for the spiritual and informational enrichment of the human society. Analogies and metaphors are immanent in all religious scriptures as subtle threads, careful following of which may through “miraculous” metaphorical leaps invoke the sense of all-encompassing relevance and an overwhelming unity of being. Patterns of meaning and beauty that arise from interpretation of narratives are the result of metaphorical projection of relationships between elements of the story onto the ones of “real-life” events.

Everyone’s favorite verses or stories are, therefore, not semantically encrypted once and for all, but may be each time revived under new contextual “skies” and thereupon lived countless times. Similar to experiential qualities resting neither only in the objective natural order nor only in solipsistic mind of the observer, but on the co-creational “way” that arises at intersection of these two co-creative poles, semantic meanings woven in linguistic communications rest neither objectivistically in textual or phonetic presentations only nor solipsistically in the interpreter’s mental sphere only, but on the relational threads spread between the
interpreter and the encountered linguistic expressions. Words identical in syntax or sound inevitably invoke specific patterns of meaning in different beings, so that each interpretation presents partly a discovery and partly an invention of meaning. Whereas the creator of a linguistic expression limits a potentially endless space of possible interpretations, the reader through personal interpretation “breathes life” into those words, so that the process of linguistic or any other form of communication becomes a co-creational encounter, perfectly analogous to the previously proposed co-creational nature of perception. As Hans-Georg Gadamer pointed out, this process of communicational co-creation of meanings may be depicted as an interaction between a horizon provided by the text and a horizon that the interpreter brings forth. As Japanese poet Saigyo stressed, “Even though I write poetry, I do not consider it as written” (Kawabata, 2001). Metaphors of dialogue, encounters and facings may be, therefore, shown as more convenient for describing linguistic communication than the ones of computational memory inputs and outputs.

To sum up, linguistic or any other type of communication does not present a purely objective transmission of meanings that could be modeled by Shannon’s theory of information. Languages are socially invented tools used for mutual co-orientation by means of implicit commitments and provisions of directives and signs that point towards the “right” ways. With the shift from ideas that meanings reside objectively in the sole information to the ones that perceive meanings as co-created in the encounter between the beings engaged in communication, the evaluation of purpose and meaning of information naturally shifts from superficial attention paid to an explicit repetitional precision of performance to cultivation of epistemological stances that provide the basis for semantic encounter of implicit cognitive features of beings in communication.

Whereas verbal conflicts between parties pervaded with mutually benevolent intentions would keep on existing for as long as the language is accepted as fundamental, a priori means of communication, becoming aware that language is only a pointer at mutual viabilities in the frame of social, “symbiotically” structured semantic conjunctions may provoke more respectful and tolerant communication attitudes that would foster joyous encounters of cognitive diversities. From such a perspective, a hope in attaining of an enlightened communication age wherein human ethics would be not verbally explicit and consequently superficial, insincere and phrased on frequent occasions, but verbally implicit and thereupon inevitably thoughtful, deep and honest could spring into life.

Finally, a few lucid guidelines may be provided as an inspiring support for such a hopeful perspective. “The heart of fools is in their mouth, but the mouth of the wise is in their heart” (Sirach 21:26), presents one of the most amusing Biblical verses that perfectly fits the proposed point. When asked what her dance had meant, Isadora Duncan replied that if she could have described it, there would be no sense in dancing it. But the whole thesis presented herein is best illustrated by the lives of some of the most influential persons in the history of the world who had not left a single written note as message to the coming generations. Gautama Buddha, Confucius, Socrates, Pythagoras, Jesus Christ, and the prophet Mohammed are some of them who were showing the right way by their lives solely.
Thomas Aquinas used to write fervently until during one mass he realized that “everything I have written so far looks to me as a straw” (Ward, 2003). Luckily, when attempting to cross the border and permanently leave the country, Lao-tzu was stopped by a guardian and forced to write down his teachings before he was let through, which is how the wonderful _Tao-te-ching_ came into existence. And in the middle of it, Lao-tzu writes that “nothing can be compared to the teaching without words” (_Tao-te-ching_ XLIII). “For I through the law am dead to the law, that I might live unto God” (Galatians 2:19), were accordingly the words of Paul the Apostle. The metaphorical nature of every sort of knowledge implies the same thing—that application of knowledge defines the scope of its meaningfulness. Or as Confucius noted: “The essence of knowledge is, once you’ve got it, apply it.” Only through such an attitude will we differ from the scribes and Pharisees for whom Jesus said: “All therefore whatsoever they bid you observe, that observe and do; but do not ye after their works: for they say, and do not” (Matthew 23:3).

**DERIVING HUMAN ETHICS BY METAPHORICAL OBSERVATION OF NATURAL PHENOMENA**

Split a piece of wood; I am there. Lift up the stone, and you will find me there

Thomas 77

Ethics of human behavior may be inferred in a simple, and yet immaculate manner from pure and imaginative observation of natural phenomena. For example, as analogous to autopoietically organized biological systems of Nature, building each other up through daily social and ecosystemic communications and creative deeds can be regarded as a fundamental ethical guideline for acting in truly sustainable and harmonious ways. Then, there is the example of the Sun. As it shines its light, and brings the source of life to the Earth, it does not ask for reciprocity. Deeply oriented inward, burning its inner essences, it lives in desolation and darkness, although making the whole planet cheering with life. Just as the physical entities are in the framework of quantum field theory represented as patterns of relationships through which the entities may be related to the rest of the world, more complex natural systems, including individual beings, may be accordingly represented as complex sets of harmonies through which they “give” themselves to the world. “There is no I, but I am,” as Ferdinand Ebner said, reminding one of the nature of divine identity (Exodus 3:14) and to the ethical guideline of “to give and to be is more than to have,” naturally derived thereupon. In writing “The sky and the Earth are long-lasting; that is because they live for others; that is why they are endless” (_Tao-te-ching_ VII), Lao-tzu claimed, whereby the image of crucified Christ with his bowed head and stretched hands symbolizes a similar Sun-like inwardness that glows with its burning essence to the world. Such a balance between focused, meditative inwardness and unconditional bestowal of spiritual treasures presents a perfect ethical guideline that emanates from the briefly elaborated co-creational organization of biological experiential worlds.
By observing any experiential/natural detail, one may find enormous sources of inspiration and initiate problem-solving avalanches of logical thoughts through the discovery of appropriate systemic, analogical spurs. This can be neatly shown on a simple example of watching a tree. First of all, a tree consists of invisible roots on one side and visible stem, branches, leaves and eventually flowers and fruits on the other, which may metaphorically correspond to spiritual essence and source of cognitive being and becoming, including emotions and holistic (so-called inner) qualities on one side, and obvious physical features on the other. All natural systems could be described in terms of the interplay between apparent and measurable, and hidden and immeasurable features thereof. Area under the ground pervaded by roots typically covers much larger volume compared to the visible parts of the tree, indicating that humans are as well mainly composed of intangible and directly inaccessible qualities, whereas the apparent qualities expressed by their behavior play only a minor part in manifestation of their existence. But considering how children usually draw trees by depicting only their obvious outlines and disregarding the invisible roots (Vögl, 2001), the existence of serious flaws in the current education might be inferred by analogy.

If one were to search for those invisible sources by digging, touching, and directly affecting the sensitive and concealed patterns of the tree, the essence of the tree would become hurt, extending the damaging effects to its visible parts as well. Care about a tree is reflected not in disruption of its inner parts, but in irrigating its soil and hoping for the water to reach its roots. True care is thus not present in swilling the tree’s leaves and branches, but irrigating its hidden root system, meaning that humane care would be present not in saying words of sweet and pleasant literal meanings, but in providing implicit care, independent on the meaning of words, although still somehow dormant in them. “The right words need not be true words and the true words need not be right words” (Tao-te-ching LXXXI) were the famous words of Lao-tzu that neatly describe the need for such an implicit ethics that does not reside within the literal meanings of the words that we use, but in tendencies, intentions and aspirations that invisibly stand at the root of all our expressions and worldly actions. However, even then we would never know whether the droplets of water that fall on the soil will ever reach the roots, which reminds us of the Buddhist teaching that “we cannot give a way to someone, but only point at it.”

Trees in a forest form a connected network of roots so that they nourish each other through it, which indicates the existence of similar inexplicable connections at the level of social and other ecosystemic communications. Analogies may also be offered by tiny stalks of grass that belong to some of the most adaptable plant species especially because of their high proportion of root surface to the overall plant volume (Storer, 1953). This may remind us that when one is deeply ingrained in invisible qualities of human ethics and spiritual virtues and also humble in its expressions, he becomes exceptionally resistant to careless acts of its surrounding, always finding ways to rejuvenate its creativity after occasionally some stamping feet squash its visible parts.
A relatively tall tree needs to excrete small droplets of water on the surface of its leaves and let them evaporate in order to sustain the osmotic pressure by which the columns of water are being dragged from the root system of the tree to its higher parts. Similar to this process, known as evapotranspiration, only generous dissipation of our precious qualities may sustain the flow of divine qualities through our beings. And in relation to one of the Christ’s metaphors in Sermon on the Mount (Matthew 5:3), the poorer in spirit we are, the more spirit we will have, so to say. It is thus giving and shining with the pleasing grace that keeps the very stem and spiritual roots of our being strongly established and flexibly sustained. Freely giving the droplets of water that will bring rain to some other thirsty trees and forests presents the pathway to mutual sustainability, particularly when we know that in this way “trees form rain that forms trees” (Lovelock, 2005). As a matter of fact, all the ecological relationships may be depicted by circles wherein every cause presents an effect and vice versa, so that signs of goodness inlaid here would be reflect in an increasing welfare in some other distant parts of the world.

But when the trees grow too much in height, they may as well forget about the need for development of the small ones. Such was the case when the trees of oak and tulip forests had grown so big that their own seedlings could not survive in their shade, and were eventually replaced by shade-tolerant trees like the beech, sugar maple, and hemlock. The soil of Amazon forest, known as the planetary “lungs” (Tuxill, 1998) and the Earth’s “air-conditioning” system, is not brightly illuminated and rich in composition, but rather opposite: it is the one with dark surface and malnutritioning composition. The typical Amazon trees do not rise and grow quickly, but due to such conditions develop slowly but persistently. An ethical lesson that we can sap out of these relationships is that it is not well-protected, well-nourished and mild conditions that foster the growth of exceptional human characters, but rather the opposite—problematic and miserable circumstances that surround one’s growth may predispose the occupied being to an upsurge of extraordinary creativity traits. Shadowy doubts, sad empathies and crucifying dilemmas may be perceived as some of the prerequisites for the rise of the most beautiful inner sources of inspiration. To get back to the Christ metaphor (Matthew 5:3), the occasional states of sadness because of feeling poor in spirit—possible only when we have spiritual intentions on our mind—can be read as the signs of our implicit orientation toward the right way.

It is not fast growth and quick understanding, but slow, humble, and minute development that leads to cognitive brilliance. Or as Alexander Pope put it once, “Some people never learn anything because they understand everything too quickly” (Hoff, 1992). Systemic reasoning requires numerous analogous comparisons and a patient cultivation of inner inspiration until one gets to meaningful parallels and “patterns that connect”. Brilliant expressions and ideas could rarely be “understood” (in terms of their metaphorical reflection onto imagined circumstances or events) at first glance, instead, their systemic character predisposes them to match innumerable life situations and show relevancy in miscellaneous experiential domains. Similar to the evening Sun throwing vivid and sparkling reflections across the sea surface, the reflections of our mind rapidly mix and match
up the “cards” of various imagined situations and relations with the proposed ideas in a metaphorical search for significant meanings. And these stochastic processes of systemic search for general metaphors and inspirational narratives on one side, and discoveries of relevant matches with personal experiences in the opposite direction, are in the frame of evolution of human knowledge almost as miraculous as the evolution of contemporary life forms from genetic mutations and shuffling. A divine inspiration that miraculously guides these stochastic processes might be, however, postulated in both cases. Nevertheless, placing a vigilant, curious and wide-awake attentiveness on the epistemological piedestal of patience, calmness and serenity, illuminated by the knowledge that a long way leads to deep understanding of all important ideas and ethical attitudes in life, presents the key to wise, “quick but slow” systemic thinking.

After sowing the land and planting new scions, a wise gardener does not expect the fruits of his marvelous work to immediately overwhelm the earth, but knows that sometimes whole generations must pass before people spot the subtle aftermaths of their ancestors’ labor. The growth of a tree is to human observers a slow and unnoticeable process in real-time conditions, and correspondingly we should not impatiently expect that the rewards and praises for our ongoing efforts come too soon. Renunciation of valuing apparent and immediate praiseful responses to our deeds is one of the keys to attaining truly ethical stances for guiding our actions. Whereas little valuable deeds often induce quick satisfactions, this does not hold for the most valuable decisions and deeds in life. Kind acts and noble thoughts quietly and imperceptibly create effects in our mental, creative and ecological backgrounds. And instead of hurrying, shaking, and sowing the tree so as to reach its fruits quickly, by patient anticipation for the tree fruits to fall into our serene embrace the wise gardener spontaneously gives rise to a wonderful ethical background from which numerous satisfying accomplishments may flourish.

Finally, the tree never directly consumes its own fruits. Therefore, the wise gardener may know that his actions do not serve the purpose of bringing himself benefits and profits, but they ought to present acts of spontaneous giving and enlightening of the world, without asking for anything in return, similar to the mentioned way of the Sun. And finally, a single tree during its lifespan branches, blossoms, fructifies, and dies, creating many seeds that may sprout into new trees on the way. Maybe such nature of a tree’s progeny formation reflects the overall spiritual order of the world, dominated by an endless creation of starry souls that through making earthly mistakes learn to become sunny sources of whole new worlds of experience. It could be also that our very beings during the existence continually sow the world not only with effects of our apparent actions and achievements, but with our deepest aspirations, ostensibly concealed emotions and inspiring thoughts, creating the imprints of our deepest dedications upon innumerable global aspects of the natural and social order.

And here we will stop with numbering ethical ideas that may be derived by simple and yet profound watching of a tree. Numerous other natural details hide inexhaustible sources for discovery of amusing natural patterns and everlasting Cosmic rules of divine behavior. As William Blake wrote: “To see a world in a grain of sand, and a heaven in a wild flower, hold infinity in the palm of your
hand, and eternity in an hour.” And although some might say that a forest map could not be constructed without observing the forest from many trees, deep and profound focusing of our senses and metaphorical leaps of our mind upon single details of our experiential worlds present initial steps towards comprehensive knowing of the larger wholes. And we have seen here how smallness and minute and patient observations may through metaphorical, systemic reasoning lead us from seemingly trivial and unimportant worldly beings and events to grasping the whole Cosmos in our hands.

It is only up to an observer’s imagination to hinder or instigate as well as to find nice and inspiring or vulgar and depressing metaphors through applying such a systemic reasoning upon any contemplated experiential whole. Whereas fostering analogical reasoning may provoke schizophrenic features of thinking and traits of other mental disorder illnesses, it is also the basis for emanation of fine sparkles of divine inspiration. Such a dichotomy should not be too worrying when we recall that all human inventions, from religion to language to science and technology may always be used for thoroughly various and sometimes completely opposite means. Accepting logical rules as the basis of reasoning carries a similar dichotomy of immanent dangers and useful guidelines. If applied as pragmatic means, aware of its relation to investigated experiential features as analogous to the relationship of a map to its territory, logic presents a viable reasoning methodology. However, when seen as inherent in the very fabric of the world, one can easily find oneself in position of the devil from John Milton’s poem “Paradise Lost,” lost in the labyrinth of one’s own thoughts in attempts to logically explain the paradoxical foundation of natural and spiritual aspects of informational evolution. Also, if we consider that every sort of scientific and technological development and evolutionary step sprang into life on the basis of problem-solving attempts, it becomes clear that opportunities to advance forward are necessarily linked to problems and dangers, as well as that every harmonious aspect of the world has its other inherent side of potential dissonances and disruptions, and vice versa.

Scientific representations of natural processes and relationships similarly abound with enormous ethical and aesthetical potentials. Although the models of atomic, molecular or macroscopic physical interactions may provide us with surprising ethical norms, only one such example will be mentioned here, and that in the form of comparative description of artificial and natural production processes. Namely, synthetic methods in chemistry rely on using: (a) relatively complex building blocks, simple media and simple processes; (b) linear reactivity (one reaction at a time); (c) quick attainment of final states (due to far-from-equilibrium conditions); (d) dealing with molar quantities; (e) tendencies toward a duplicating reproducibility. On the other side, natural (biomolecular) synthetic processes are typical of using: (a) relatively simple building blocks, complex environments and complex processes; (b) parallel processing (hundreds of reactions at a time); (c) relatively slow attainment of final states, (d) dealing with sub-picomolar quantities; (e) imperfect reproducibility (overcome by high selectivity for products that meet the required specifications) (Viney and Bell, 2004). However, comparisons of artificial and natural processing pathways may be useful not only for the refinement of human production settings towards imitating natural
elegance and efficiency in creation, but also for the improvement of our cognitive attitudes on the way toward reflecting the breadth of Nature in our every thought and act. From the presented comparison, we can thus conclude that such a way ought to comprise the following norms: (a) the use of simple ideas in ever wider and all-comprising contexts; (b) simultaneously creating and learning on miscellaneous acting aspects; (c) not rushing and maximizing, but slow and optimizing, deliberate creation; (d) finding virtue not in gigantism, massiveness, and superficial strength, but in small events, processes, production settings and yields, as well as in wavy flexibility, durability and the economic norm that “small is beautiful” (Schumacher, 1998); (e) always novel adaptation of our creative products and acts to unrepeatable circumstances, and not valuing mechanistic reproduction of creative acts, but reaching “perfections through imperfections.”

The same metaphorical nature of intrinsic expressions may be regarded as valid for religious towers of knowledge as well. Lives of many sages, including most notably Jesus Christ, have presented resolute battles of reason against literal interpretations of the sacred scriptures. Therefore, instead of the system of knowledge that reveals experimentally unverifiable truths, religion may be said to represent sets of metaphorical directives that point towards the pathway of learning the elementary ethics of living. The life of Christ and the Book of Revelation, for instance, may thus be seen not as truthful representations of supernatural phenomena, but as humble stories about spiritual journeys of individual human beings. Crucifixion and resurrection may be seen as metaphors of either the vanity of attempts to extinguish the boundless virtue of a loving heart and its good deeds or of self-sacrifices and dissolution of egotistic personality traits as the natural steps towards reaching true happiness and, in a sense, fulfilling the story of our individual living journeys. The biblical tree of knowledge may neatly represent the human capability of performing reflective mental operations, as equivalent to conscious observations of the very processes of observing. The moment when the abilities of mental reflections dawned upon humanity may be considered as equivalent to the evolutionary emergence of consciousness and self-awareness of life, whereas one may note that in parallel with a systemic ascension from the experiential level of primary perceptual observations to the second-order cognitive level of observing the primary observations, the potential for exhibiting ashamed, disgraceful and desperate states of mind (that the expulsion from Paradise symbolizes) is growing in the same extent as the wondrous capabilities of human minds are exercised. “For in much wisdom is much grief, and he that increaseth knowledge increaseth sorrow” (Ecclesiastes 1:18), Ecclesiastes wrote, whereas we should keep in mind that vigilance, cautiousness and prudence that the heedful attitude of self-consciousness and self-awareness brings forth gently cultivate the roots of wise, sensitive and rational beholding of the world.

However, it indeed seems that every natural or Biblical event may be metaphorically interpreted in an endless variety of ways, ranging from beautiful, highly ethical and inspiring to dark, destructive and pointless. Today’s popular representations of biological creatures and social and ecological events using neo-Darwinian, militant and manipulative metaphors may accordingly be challenged by the limitless set of inspiring imagery, including representations of life in form of holistic systems
and harmonious, musical interactions of countless relations (Capra, 1996). Great care should be paid to an inherent beauty and qualitative richness of the metaphors applied in the course of systemic reasoning, edification of understanding and evolution of meaning in our cognitive spheres, especially as we may know that people form metaphors that form people. Nietzsche’s Zarathustra at one point on his journey regards the metaphor of a tree as the one according to which every being possesses roots in darkness and evil, whereas his branches and blossoms “dwell close to the seat of the clouds” (Nietzsche, 1883). But again, particularly because of this intrinsic freedom to subjectively direct the metaphorical processes of interpretation and understanding, there always is a way out. Namely, Nietzsche’s metaphor of a tree may be understood in a way that dialectics embodied in form of dialogical disagreements of cognitive perspectives and worldviews presents the basis for improvements at the level of individual and common understanding of experiential realities. “For if the firstfruit be holy, the lump is also holy: and if the root be holy, so are the branches” (Romans 11:16), as was the part of Paul the Apostle’s sacred teaching. Thereupon, we can reasonably accept a more profound stance according to which a human tree of knowledge mutually develops its sacred and invisible qualities and diversifies the organization of its stem and branches. From such a point of view, spiritual (invisible and foundational) and informational (visible and measurable) evolutions could be observed as taking place in parallel, mutually supporting each other, similar to the parallel lines of a railway track or a pair of flapping wings of a bird that through complementary action support a starry train ride and a heavenly bird flight, respectively.

CONSEQUENCES OF ACKNOWLEDGING THE METAPHORICAL NATURE OF SCIENTIFIC CONCEPTS AND THE IMPORTANCE OF SYSTEMIC REASONING

The oversimplified ideas will always displace the sophisticated and the vulgar and hateful will always displace the beautiful. And yet the beautiful persists

Gregory Bateson (Bateson, 1979)

Science could not be regarded anymore as a positivistic pathway to objective and observer-independent representations of a universal reality. From the co-creational perspective, scientific knowledge may be considered as a pattern of relationships that metaphorically reflects the interrelation between subjective and realistic aspects of the observed natural/experiential phenomena (both of which could not be known alone, due to their inextricable entwining in emanation of all experiential qualities), and consequently points partly to the organization of hidden ontological order of experiential reality (D’Espagnat, 1979) and partly to the epistemological heart of explorer. Interestingly, an identical definition could be provided for innumerable other explanatory models utilized within the human societies. Conflicts between scientific and religious worldviews might be elegantly resolved at the very foundations with such a “tolerant” shift from reliance on explanatory models employed with assuming the possession of exclusive privileges to describe universal
(i.e., single existing) truths to their application in form of pragmatic metaphors for describing only one or a few out of endless possible aspects of manifestation of co-creational interactions between impalpable epistemological foundations of a being and imperceptible patterns of “hidden” ontological reality.

Acknowledgement of the same, pragmatic and metaphoric roots of all human endeavors, from scientific schemes and technological blueprints to artistic concepts and religious scriptures, may naturally expand the potential for their flourishing interlacement. The achievements of modern music and other contemporary artistic forms related thereto present nice examples of a successful intrinsic incorporation of scientific discoveries (in form of technological products) in the manner, mode and style of contemporary musical expressions. The theoretical framework of quantum chemistry becomes “incorporated” in computer hardware and implicitly present in modern-day word processors that significantly facilitate the art of writing and thus leave significant traces on the patterns of human communication, evolution of their understanding and the nature of spiritual experiences as well. On the other hand, learning from the artistic concepts of beauty and symmetry may also significantly improve the conceptual arrangement of scientific presentations, impart useful incentives and clarify the contextual character and profound meaning of scientific inquiry. Miscellaneous other “glass bead” games (Hesse, 1943) may result from acknowledging the same, pragmatic and metaphorical basis of science and religion and arts, and creatively balancing scientific rigor with artistic inspiration (Bateson, 1978).

When we understand the layered nature of systemic reasoning, it would become clear why the works of Nature and artistic masterpieces may reflect their explicit meanings at many different levels of their organization and widely diverse perspectives of their apprehension. Consequently, writing about harmony between scientific rigor and artistic sensibility without reflecting such a balance in the construction of each sentence, paragraph and structural and conceptual course of the whole work (i.e., the thread that links beginning to an end), presents an incomplete task. Approval of the key role that imaginative metaphors play in the formation of scientific knowledge could lead to incorporation of the lessons on art within the basic scientific education. Learning through analogies, stories and metaphorical hints may thus present a natural form of studying any science or art.

Instead of one’s rigid reliance upon fixed descriptions and their autocratic propagation with referring to their “true” character, genuine curiosity and trustful adoption of numerous worldviews can be stimulated from the cognitive attitude that recognizes omnipresence of metaphors in all domains of human experience and communication (Dykstra, 2001). C. W. Churchman (1968), in that sense, proposed the following lines of thought: “what is in the nature of systems is a perception and deception, a continuing reviewing of the world, of the whole system, and its components. The essence of systems approach continuing, therefore, is confusion as well as enlightenment. The two are inseparable aspects of human living. Finally, then, here are some principles of a perception–deception approach to systems: 1. The systems approach begins when first you see the world through the eyes of another.” Acceptance of other experiential worlds as equally real and significant as our own provides a glimpse into one of the crucial aspects of the
Christian love, and opens the way towards transcendence of the alienating egotistic drives of the modern society. Misleading engagement in fights “for . . .” and “against . . .” could correspondingly be transformed into an attitude of simultaneous embracement and unison of versatile perspectives into meaningful wholes and instigation of their diversification into a fruitful and vivid multitude of beings, opinions and worldviews.

General framework of the actual R&D plans presumes that scientific progress proceeds irrespective of whether ethical and aesthetical criteria are taken into account or not. The world of science, in other words, paradoxically becomes an outcome of “the process of imagining a universe entirely free of our imagining” (Glanville, 1995). In spite of the socially prevalent objectivistic attitudes, however, science may be more properly depicted as an imaginative and diligent co-creation and exchange of metaphorical directives in benevolent and spiritually edifying human-to-human relationships. After the long historical era dominated by objectivistic notions and attitudes that have given rise to autocratic opinions and conflicts of exclusionary ideas, scientific explanations and everyday assertions could now rise up under the sky of a restored “age of reason” as novel co-ordinational tools of metaphoric and pragmatic character. The relevant “ticking” of the true essence of science is thus, similar to the meaning of any language expression, partly restored from the sole scripts and inertly drawn lines and messages to creatively wiggling cognitive cores of human beings.

Scientific ideas, therefore, need to be developed and employed in continual reference to a wide context of sustainable evolution of social, ecosystemic and biotechnological patterns of communication, which may in future become openly related to diversification and enrichment of ethico-aesthetical and spiritual aspects of human consciousness. Since experiential compatibilities at the social level present the conditional basis for derivation of all scientific explanations, science can be regarded as an empirical methodological aspect of a broader self-organizational network of social interactions, inherently guided by implicit intentions of participants toward benevolent and efficient co-orientation of human experiential worlds.

Scientific descriptions of the world may be, therefore, accepted not as the only possible and universal explanatory schemes, but as only one from an infinite spectrum of pragmatic ways to coordinate human actions in the world. Galileo Galilei believed that the Earth was moving and that the Sun was still; Inquisitional premises were opposite—that the Sun was moving and the Earth was still, whereas Newtonian astronomers came to the conclusion that both the Earth and the Sun were moving. However, from the framework of relativistic definition of physical qualities, all of the three astronomical worldviews may be shown as equally “true,” and that through invoking the simple relativistic adjustment of meaning for the notions of “rest” and “motion” (Whitehead, 1925). Many similar universalistic disputes could be exquisitely resolved through revisions of implicit assumptions of the confronted worldviews. Similar as Immanuel Kant’s philosophy of transcendental idealism united the philosophies of rationalism and empiricism, Christian Huygens’ wave theory of light and Isaac Newton’s particle theory of light were
merged within the quantum theory concept of wave–particle duality of physical entities, and topological geometry united the concepts of Euclidian, metric geometry and analytical, projective geometry, deduction of wider, richer and deeper (referring to implicit contents) perspectives of viewing the co-creational relationship between mind and Nature presents the way toward unification of complementary worldviews of science and religion, as much as of “chained” logical and “leaping” metaphorical aspects of creative reasoning. Open-minded retrospections and deliberate revisions of the foundations of our reasoning, therefore, present a safe route to transcend the programmatic, “blind” evolution of understanding (regarded as the most significant invention of the 19th century— invention of the method of invention, which consequently led to a continual advancement at the level of professionalism with ignoring the role of systemic, common-sense wisdom and aesthetics of reasoning) and arrive at the fields of cooperative co-creativity and spontaneous acknowledgement of the key role that implicit spiritual aspirations play in the development of any science or craft.

Attachment of the metaphorical criterion of “viability” to scientific descriptions and linguistic assertions implies that instead of being “masters” over human patterns of reasoning and creative options, science and language may become faithful “servants” on the road to fulfillment of benevolent human aspirations related to enrichment of the surrounding experiential worlds through their utilization. Similar to many other products of human work and inventive creativity, science is predisposed to be a pragmatic servant of human intentions, although it may be easily transformed into a “blind” leader thereof whenever scientific representations of epistemology-mirroring and inherently co-orientational character become mistakenly identified as reflections of intrinsic qualities of objective and universal Nature. Dichotomy proposed herein resembles the ancient polarity (Lumley, 2000) between Heraclitus’ advocation of pragmatic, contextual, and relational “the way the world works” understanding, and Parmenides’ and subsequently Aristotelian reductionist ideal of “the way the world is” comprehension of experiential reality. However, from a pragmatic vision of the world, any formal specification of experiential phenomena can be comprehended not in terms of an inherent elimination of all that is neglected and missing in the constructed descriptions, but in terms of an arbitrary application of convenient approximations that carve pragmatic pointers with benevolent communicational purposes. Scientific universum, therefore, instead of being a universal reference frame which conditions the existence of scientific assertions and comprises implicit requirements toward compliance (hence the analogy of a “bad” master) to objective knowledge in order to reach any level of co-existence and avoid conflicts of opinion, becomes a “multiversum” filled with ideas of existence of as many different domains of truth as the number of ways to outline the traits of experience is (Maturana and Poerksen, 2004). In the multiversal world, consensuses are reached not by referring to possession of the access to a privileged panorama of the objective, observer-independent natural order, but by finding the patterns of mutual understanding. Rigid objectivistic frameworks and norms that require unconditional submission thereto, as well as the corresponding emanations of fundamentalism, totalitarianism, intellectual imperialism, irresponsibility, and the tendencies to exclude, dominate and control
may be transformed into flexible cooperational spheres and co-creative correlations of ideas, implicit assumptions and points of view. In accordance with the co-creational character of our experiences, search for the dynamic, versatile and non-permanent balances between subjective and objective features within every form of knowledge opens the door for endless evolution of scientific thought.

As we approach the final lines of this article, we may recollect the path of Immanuel Kant’s late philosophical journey through the regions of practical and pure reason: “Reason, in its speculative employment, conducted us through the field of experience, and since it could not find complete satisfaction there, from thence to speculative ideas, which, however, in the end brought us back to experience. In so doing the ideas fulfilled their purpose” (Kant, 1781). Such a path is reminiscent of an ancient Oriental story in which a Zen master explains the process of his inner spiritual pilgrimage: “In the beginning, the rivers had been rivers and the mountains had been mountains; when I began studying Zen, the rivers ceased to be rivers and the mountains ceased to be mountains; but now, when I have mastered Zen, the rivers are rivers and the mountains are mountains again.” The path of spiritual ascension of Wolfgang Goethe’s Doctor Faust in similar manner attains fulfillment not through self-satisfying conceptualizations and idealization of perfectly complete and consistent models of natural order, but through devoted, whole-hearted, and unconditional serving of other beings (Dyson, 1979). When asked to explain how he had reached the treasures of his wisdom, a Sufi master, al-Bistami, replied: “Leave the door open, my mother said once, and I spent the whole night paying attention to the accomplishment of her wishes. This is how the things that I sought for miraculously entered through that door” (Vitray-Meyerovitch, 1978). These and similar beautiful narratives may provide us with precious “compasses” of knowledge, which every now and then redirect us back to the genuine beginnings of our scientific journeys, reflected in the deepest epistemological settings of experiential co-creation. All of our successful and truly creative endeavors may be consequently recognized as being inherently guided by the patterns of love and care for the beings of the world set at the very epistemological foundations of co-creation of our primary experiences, cognitive reflections and actions. All apparent and visible aspects of contemporary communicational networks may be correspondingly regarded as superimposed on and truly driven by the graceful “compass” of care and attention for other beings, residing at the very core of our hearts. In proposing so, we have finally arrived to the major conclusion of this article:

Love and care are the foundation of all knowledge.

Science, therefore, has the roots that reach deeply down to the domain of patterns of love and care among human beings, which clearly opens the door for natural compatibility of religious and scientific studies, as comprehended from the metaphorical points of view. The whole fundamental background of reasons for the conflict between science and religion has thus vanished. We are left with the metaphorical tree of our contemplation, imagining how studies of religious metaphors deepen the invisible ethical roots of the scientific stem and branches of
knowledge, whereas our practical devotion to scientific and technological endeavors strengthens and invigorates the potential for ever more intensive and richer drawing of saps and waters of enlightening religious experiences.

CONCLUSION

Getting back to the place where we started from, we may recall once again that logical reasoning on the basis of presupposed and unchanging rules presents an inconvenient method for revision of these elementary criteria of selection and their re-evaluation in terms of more prosperous ones (Hong, 2003). Learning to search for the reflections of invisible epistemological foundations upon which all the results of our perceptions and reflections implacably stand, and flexibly revise them through metaphorical thinking and holistic inspiration presents a spiritually rewarding task. The Little Prince once noticed that “the stars are beautiful because of a flower that cannot be seen” (Saint-Exupery, 1946), pointing us to the all-encompassing importance of invisible roots of the co-creation of every item of the world of our experience. The hypothesized co-creational organization of the worlds of our experience, which corresponds to accepting every experiential detail as arising out of an invisible dialogue between the deepest epistemological foundations of our beings and the divine teaching force of God, invigorates wise aspirations to mutually improve the invisible spiritual roots of our beings and the obvious order within the tree of human knowledge and its worldly applications.

The beauty of science lies in perceiving and revealing miscellaneous metaphorical signs with both spiritual and pragmatic meanings as incorporated in the very fabric of the Universe. The steps of our spiritual evolution are marked with reading such subtle signs on the way towards realization that every aspect of our experience presents a metaphor of our epistemological foundations in form of the deepest intentions and aspirations through which we approach phenomena of experience. And in that evolution, we may eventually become as deep in our co-creational encounters with God as the whole nature, reflecting the inner peace of deep blue sea, endless inspiration of drawing milky sky, blushful grace of motley rainbow or silent, but wondering inquiry of sparkling stars in every instant of our radiant co-creative existence. And on the way there, let us be reminded that in order to avoid being superficially literate hypocrites that merge maps with their territories, and start reading “the signs of the times,” we should appreciate the strength of metaphors and their pervasion everywhere, throughout the domains of art, science, philosophy, and religion, and as such engage them at the very foundations of our education.

REFERENCES


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