12-1-2012

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Recommended Citation
Uskoković V. On love in the realm of science. *Technoetic Arts*. 2012;10(2-3):359-374. doi: 10.1386/tear.10.2-3.359_1

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Abstract In the first half of 2009 I organized a series of talks at University of California, San Francisco. The series was dedicated to observing science from a wider perspective and figuring out where its trains and we as scientists in it are heading to. The final presentation in the series I envisaged as the one drawing threads between love and science. However, my aim was neither for that particular talk to be the one of explaining sensations of love using scientific language nor to be based on pastoral and pathetic eruptions of love about science. What I had in mind was a description of an adventurous quest to find love at the core our scientific endeavors. As my attempts to find an appropriate lecturer failed, I decided to engage myself in such an adventure. This is how this paper sprung into life. In it, I slowly tread the way towards realizing that the heart of love beats at the core of the scientific enterprise of humanity. To reach this center, I have traveled through the intricate forests of discoursing on the concept of experiential co-creation, the uncertainty principle, the dichotomy between Empiricist and Renaissance scientific methods, the tautological character of logical inferences, and scientific descriptions as pragmatic sets of metaphors or pointers used in the mutual coordination of experiences at the social level, having ocean waves, seashore pebbles, corals, fish, atoms, gramophones, pine trees and stars passing me by, and yet managed to emerge back to light with the treasures in my hands.

Introduction

Here we are, standing on the seashore with arms raised high, dancing with the summer breeze and listening to the gentle waves of the sea as they crash against the coast. As we gaze in the distance, amused by the sparkles of sunlight reflecting off the watery surface, we let the waves of the sea lightly caress our feet with a rhythm of alternately retreating and approaching, moving away and then softly crashing over us. As we absorb this marvelous music of the sea, we are prompted to think of whether this alternate moving to and fro could be yet another metaphoric pointer in the direction of the Way as the ubiquitous symbol of our knowledge and being[1].

Namely, all things that we are aware of, all the details of our perceived experiential realities could be seen as arising from the touch between human cognitive apparatuses and Nature, which is the central proposition of the co-creational thesis I have developed over years[2]. Everything perceived and reflected on could thus be seen the product of an intrinsic creativity of us as the cognitive subject and of Nature, arising as the touch between the two, somewhere along the road that connects the deepest epistemological wells of our being and the voice of Nature hidden behind the veil of experiential appearances. Directly from the foundations of the co-creational thesis, pillars of another principle applicable in the social domain, which I have named the Way of Love, arise.

The Way of Love argues in favor of the need for two nods of the string of the music of life to be anchored tightly, one in the domain of the subject's heart and mind and the other one in hearts and minds of others, in order for this music to spread its wings. Furthermore, in order for this string, the way spread between our cognitive landscapes and those of surrounding creatures,

to fluctuate and produce sounds, ceaseless alternation of the moments of approaching and distancing needs to be present. Thus, the Way of Love is about alternately distancing ourselves into a meditative and self-integrating silence of our own being and empathically uniting with eyes and worldviews of others. Needless to add, it has arisen from the metaphor of the Way, that is, of simultaneous separation and connectedness that every way in Nature represents. Hence its name: the Way of Love.

Yet, the reason why we are here today is not to merely recapitulate what has already been confirmed many times in the sphere of our knowledge. Rather, the symbol of the Way whispers to us that the secret lies in being on the road, in searching and exploring, wondering forever more rather than encasing all the secrets worth endless wonder and locking them with the keys of fixed conclusions, final answers and omniscient attitudes. So, here we go, gazing forwards in wonder, setting our feet to another adventure in the realm of our mind. And the question is following: where do we go from now to search for the missing love in the domain of science? If we were to succeed in finding its treasures and bring it back to the coastal surface for all people to enjoy in its beauty, many waves of unhappiness and spiritual perplexity that wash over the coasts of human minds dedicated to science nowadays could be solved. For, everywhere we look, even in the most developed and affluent parts of the world, we could realize that suffering is immense. Physical hardships dominant in the past have been substituted by emotional and intellectual suffering, and an urban Buddha of the modern day would be mostly stunned by recognizing the latter, asking oneself what would be the way to transcend the curse that has taken over contemporary human minds like a plague and has been depicted in Lord Byron's verses: "Sorrow is knowledge, those that know the most must mourn the deepest, the tree of knowledge is not the tree of life". Clearly, if we succeed in finding the treasures of love and reinstalling them in the heart of scientific enterprise we may be able to dissolve the curse that has been epitomized in the old biblical story about the tree of knowledge and the expel from Paradise that tasting its fruits that gave humans the ability to discern good from evil entailed. Hence, we could be moved by curiosity and benevolence, by Wonder and Love, at the same time in our exploratory journey that is to follow. And with Wonder and Love enlightening our heart, as I pointed out many times before, our adventures can begin, as it is these two ubiquitous powers that present the starting points and final destinations of all knowledge and being[3].

Still, making the first steps in anything in life, in spite of the powerful drives resting within us, is hard. And so, as I sat on the shore, alone, deeply plunged in the starry silence of my being and yet thinking together with Nature as a whole, wondering where to start, I recalled that, according to the co-creational thesis, all things around us arise from a dialogue between the depths of human mind and Nature. This directly implies that small is indeed immensely beautiful as all things around us are incessantly handing us keys to answers of questions posed as bricks within the foundations of the worldviews with which we approach experiential phenomena. And so I looked around, noticed a little pebble and started to play with it in my hands. Negligently, I wanted to throw it away and switch my playful attention to something else, but then a scene from *La Strada* miraculously flashed on the screen of my mind. In it, the clown comforted sad Gelsomina by picking up a stone from the ground and explaining to her how even that tiny stone had to have a purpose in the light of the whole. So, let us look closer at this pebble just for a while. Let's see how far an inspired observation of a stone may take us.

The Way down: Loving Nature and humanity as the key to creativity in science

As we gently pat the pebble, just as the waves of the sea did seconds ago, we may realize how hard or soft it is. But remember, these qualities are not absolute. They are determined by our own notions of hardness and softness. What is soft from the perspective of diamond might be hard from the viewpoint of talc. Mechanical characteristics of a solid material are thus defined using specific units, be it Pascals in physics or numbers of the Mohs scale in mineralogy. Likewise, each physical quality has to be defined as relative to a referential scale. Or, as Protagoras of Abdera used to say, “Man is the measure of all things”.

Saying this, I jump into the water and, surrounded by corals and fish, begin to wonder. As an ardent swimmer, I have always wondered if swimmers should move faster in chlorinated pools or in salty water[4]. To answer this question, just as any other, we need to take into account both subjective and objective factors. That is, our emphasis needs to be placed on an interaction, in this case between the swimmer and water. Firstly, the swimming velocity of a swimmer would vary depending on density of the medium. Whether viscosity of the watery medium would be shifted towards the one of air or the one of honey, the result would be the same: a decreased velocity. Therefore, for any given swimmer there ought to be an optimal viscosity of the swimming medium at which his speed would be maximal. But this is only the objective aspect of our analysis. Now we have to shift our attention to the subjective side. And so as I make a summersault while diving with puffed cheeks, I take a note of how the human body is subject to modifying its constitution depending on the environmental and behavioral requirements. Therefore, a swimmer moving through a lighter medium would gradually develop a lighter body that would propel it quicker in that particular medium, whereas a swimmer swimming specifically in a denser medium would develop a heavier and a more masculine constitution. The effects of relatively small variations in density of chlorinated and salty water might be therefore compensated by the effects of variations in the subject’s properties. Hence, I started with a question and ended up with a question, but on the way between the beginning and the end an important observation was made. “Always a more beautiful question to those who ask a beautiful question”[5], Gregory Bateson observed. After all, had all the enigmas in our heads been solved, our exploratory swimming in the ocean of the unknown and undiscovered would cease to exist and the wheel of evolution spun by our revelatory intellectual quests would be brought to a halt[6].

Thus, as I emerge to the surface and soak myself in the Sun again, I conclude the following: properties of natural systems we explore always result from their interaction with us as observers. All physical qualities thus need to be specified as relationships between the observer and the observed. In their definition, the properties of both the observer and the observed need to be included. From the most fundamental perspective of physical sciences, Heisenberg’s uncertainty principle demonstrates how an interaction with a measured system needs to take place prior to any detection thereof. As a result, the way in which we pose the questions predetermines the structure of the revealed answers. The way in which we look at the world predetermines what we will see.

But we should not neglect the validity of the opposite argument: that is, what we see predetermines the structure of our questions about the world as well. The face of the world partly determines the attitude with which our curiosity will face it, and the questions with which we face the world partly determine the facets of Nature that we would be able to see. Mind draws Nature, and Nature draws mind, as in the famous Escher’s painting with two hands, one drawing the contours of the other. Simply saying, we actively create our world with the very perception of ours as much as we passively detect it and, so to say, take “for granted” through our senses.

All that we are aware of as our experience derives from the interplay between creative actions of two sides: the subject and its environment. The elementary perceptive differences arise along the interface between the subject and its environment, and are defined by the biological and cognitive nature of the observer as much as by the physical nature of the impulses that the observed systems give out. These elementary stimuli are then assembled into an internal model of the world in reference to which the subject reaches and maintains a stable coordination of movements and thoughts throughout his existence. As every physical quality can be represented as arising from the touch between mind and Nature, it can be regarded as simultaneously experiential and natural. Experience seen as such could be described only from a higher level platform forming at the intersection between idealistic and realistic experiential aspects, and yet without being able to be reduced to either of the two alone.

Every quality assessed within a scientific experiment presents a reflection of both the qualities of the measured system and the qualities of the measuring apparatus. Likewise, every scientific explanation reflects both the physical organization of the inspected natural phenomenon and the presuppositions within the given conceptual system of reasoning. Every product of our experience could be thus seen as Nature providing subtle answers to questions posed at the depths of our mind. Everything perceivable to our cognitive apparatuses essentially arises from the dialogue between human mind and Nature. Both of these creative poles are, however, imperceptible *per se*, similar to the sound of one hand clapping. Only together can they produce something perceptible.

To gather an insight into precious pearls lying scattered along the seafloor of our mind, concealed within the deepest layers of our consciousness, the art of meditative diving and braveness to go deeper and deeper is required. So, let us plunge into the ocean of human mind and see how deep we could dive in our quest after the sunken treasures and maybe touch the very foundations of Atlantis, of the forgotten way of enlightened seeing the world idealized by the ancient Greeks. As we start to slowly descend along the spiral of human thinking towards the foundations of scientific reasoning, somewhat like Alice did after following a white rabbit, falling through a hole and entering a Wonderland, strange things may happen. After flying by the layers of experiential appearances and descriptive relationships, we would enter the domain of cognitive features that are increasingly being concealed and unacknowledged in one's regular reflections on the nature of scientific reason. Firstly, we will enter the domain of implicit assumptions that guide our thinking, including the basic logical propositions and their underlying concepts. However, in realms even deeper than those, the basic geometric visualizations of objects in space and time, including the notions of difference and identity, the basic binary concepts in human thinking, will be seen passing us by. Dots, lines, conservation principles and symmetry laws, deeply ingrained in the nature of human thinking would be seen as resting at this level. But just when we may start thinking how we have found the most fundamental ground, a hole leading to even deeper levels would be noticed. It would take us from the obscure basic concepts of computation in the brain, lying in the scattered dumps of our memory, to enlightening fields of our mind. This is how we enter the domain of human values, intentions, beliefs and aspirations that inconspicuously but steadily guide the processes of cognitive selections during the processing of perceptive and reflective data our consciousness collects.

It is thus that we would arrive at the edge of the center of our consciousness and be able to glimpse its incandescent core, resembling the center of the earth or the very sun. It is as if all the impressions that our perception collects on the way are sent downstream, towards the core of our consciousness, while they are being gradually modified, reshaped on the way, oftentimes

stripped off their clothes, all until their pure essence is revealed. Falling into this center, they are fused with essences of other memories, recollections, visions and ideas, somewhat similar to what happens to light atoms in the interior of the sun, from which they can rise back to the cooler areas of our consciousness, forged into more permanent shapes of ideas and thoughts and expellable as such to the surface of our being. Yet, what guides this great forging process in the core of our mind is nothing but our deepest intentions, aspirations, assumptions, emotions and beliefs.

Any framework of reasoning is based on a set of tautological premises, that is, statements that are proposed, but not proven in said framework of reasoning. In fact, we always compare the conceptual results derived upon the given propositions with the experience, so that the validness of these propositions must remain concealed. And not only that, but the finest propositions that are normally implicit within the explicated propositions - for example, human conceptions of space and time that are ingrained in most of the premises within the explanatory systems of physical sciences - present a sort of a blind spot of one's reasoning within the given system. Although they could be partially explicated in another system of reasoning - just as blind spots could be noticed after we switch the observational perspective - the foundations of this new system of reasoning would provide us with merely another set of blind spots.

In scientific descriptions, it is impossible to discern where the reflections of tautologies and assumptions of us as observers end and where the reflections of objective features of the probed physical reality begin. This is why Albert Einstein claimed that "useful mathematical concepts may well be suggested by experience, but in no way can they be derived from it…there is no inductive method which could lead to the fundamental concepts of physics; failure to understand this fact constituted the basic philosophical error of so many investigators of the nineteenth century". The basic propositions of scientific method and reasoning cannot be experimentally derived nor proved. They are preconceived and experimental insights can only rest on them more or less stable, but it can never be shown that these premises are true and the perfect ones. In other words, pillars of faith are verily the foundations of science.

Now, it is essential to be aware that, besides beliefs, our intentions also stand at the basis of every type of logical thinking. Namely, in order to start an analytical process of comparing the desirable and undesirable consequences of any action that we consider performing, we first have to come up with the question about whether to carry out that action or not. But where does that question come from? Why do we think only about the actions that we normally think about, and not about some others? Simply because the heart of our intentions is the one that raises these acting propositions in front of our consciousness. We first intend to do something, and then invoke our reason and analyze if the task conceived is favorable or not. Therefore, we can be sure that there is a substrate composed of our deepest aspirations underlying every algorithm that our reasoning proceeds according to.

If our attention in the act of communicating with others superficially lingers on mere words and their meanings *per se*, our participation in it would be predestined to be essentially fruitless. We have to pay equal attention to the intentions that shine from our mind and heart, because it is them that form true connections with the surrounding beings. Likewise, to properly understand the pragmatic core of scientific endeavors, we need to acknowledge the essential role that tautologies and intentions play in human reasoning and the formation of our concepts about our beings in the world.

This insight goes hand-in-hand with the fact that our experience arises at the intersection between its objective origins, independent on the nature of the observer, and subjective ones,

actively constructed by the observer. As a result, every experiential detail reflects the cognitive essence of us as the observer in terms of our deepest values and aspirations. The end of every observation takes us back to the beginnings: to the very heart of the observer. But as the co-creational thesis suggests that the foundations of both the subject and Nature are concealed within each experiential detail, we can also recognize the foundations of Nature in every minute sparkle of our intellect and in every natural detail.

As the observational stance with which one approaches natural phenomena is reflected in the results of experimental findings, we could conclude that one's values are likewise reflected in each detail of the outcomes of one's scientific investigations. Values of scientists thus resemble roots that feed the stem and branches of palpable scientific achievements with vital nutrients and yet remain invisible to the eye. Eliminating the need for acknowledging the role of ethical and aesthetical values in ensuring the excellence of scientific performance can be seen as a mistake of the modern age. By exploring the ancient Platonic problem of "finding an unconditional and absolute ground for conditionally derived expressions" and probing the invisible grounds upon which scientific reasoning rests, philosophy of science should complement the ordinary, "know-how" education in sciences. Education in future will have a chance to correct this mistake of omitting humane, ethical and aesthetical values from scientific practice by emphasizing the role of human intentions and emotions in properly and fruitfully conducting scientific research. For, emotions could be seen as the inner fire, the glow of which sustains and directs the creative rays of our intention.

Now, as we stand in the domain of human mind surrounded by the sea of emotions, we may wonder what the most powerful and core emotion of our beings is. Only one step is there to be made, only the final, golden bridge to be crossed. I will thence shut my eyes and dreamingly imagine angelic hands taking me across, to the other side. The Christ talked about two sources of the miraculous creativity of his: the love of God and the love of fellow humans (Mark 12:29-31), posed in parallel so as to prevent us from either the submissiveness of our sanity and creativity to the authorities of others, which makes us dependently circle around them like a passive satellite should the latter commandment eclipse the former, or disrespectful and autistic dwelling in a solipsistic bubble of our own world with the threads that once emotively and mentally connected us in the spirit of respect and responsibility to others now fully ruptured should the former commandment eclipse the latter. Hence, like the sea that washed over us in the beginning of this journey, we should also carefully balance approaching others in empathy and genuine curiosity and withdrawing ourselves in meditation and contemplation and derailing away from them, if we are to be engaged in harmonious relationships in life, which is the ideal that has been summed up in the concept of the Way of Love.

Now, as we walk along the thin line of the Way of Love, to illustrate the inextricability of the links between knowledge and love, the traditional subjects of science and arts, respectively, I will ask you to think of someone whom you love. If you rewind the history of your relationship with that person, you may notice how it is built on many lovable insights and observations. To gain those insights, patience and devotion to that person are required. In other words, by dedicating our time to know more about a given person, chances that the feelings of love will be enkindled in us soar. After all, if we defend ourselves against the need to constantly analyze the behavior of people whom we share space with on this planet of ours, insightfully trying to understand the causes behind their actions, feelings of disappointment in them and neglect thereof may prevail over love and respect. But by incessantly engaging our intellectual powers to penetrate through their words, moves and acts and into the heart of their intentions, and enrich

our knowledge of them with warmhearted feelings and images, we activate the spin of the joyous carousel of love within our hearts. Hence, we are free to conclude that knowledge feeds love. The intensive expressions of feelings that have love at their roots among humans compared to their mild forms among animals serve as simple examples of how knowledge, in terms of which human are apparently superior over animals, fuels the power of love in us.

On the other hand, one could easily show that all scientific models and relationships are partly human inventions, as they arise in the co-creational dialogue between scientific mind and Nature. All products of scientific measurements arise from the interaction between the measured systems and the measurement devices, whereby the latter include the observer's mind and all the presuppositions with which one approaches the measurements. All of these assumptions about the object of one's study become inconspicuously reflected in the final measurement outcomes. The world as we know it is thus the world of our experience first and foremost, albeit the fact that our experience still possesses solid objective traits which enable us to share our experiences, including objects and insights, among each other. Owing to this, one could consider scientific imagery not as truthful, realistic and universal reflections of an objective world that would be the same for all observers, but as partly subjective and metaphoric in nature, a product of individual and social imagination as much as an objective reflection of the world *per se*.

In view of that, we can say that products of scientific creativity partly serve the pragmatic purpose of enlightening human experiences instead of discovering the one and only truthful nature of the physical reality. As the co-creational thesis further suggests, the element of discovering and the one of inventing are, in fact, inextricably entwined, as much as the roles of the subject and the object are equally involved in defining the features of the object in the subject's eyes. Beauty lies in the object itself, but it is also partly in the eyes of beholder, as some might say. An immediate consequence of this insight is that all our efforts in the scientific arena have the ultimate purpose of enlightening the world of other people's experiences, and the greater the shine of love in us, the more open the road to extraordinary scientific discoveries will be in front of us. The more we love and respect humanity and fellow earthlings, the greater the drive will be in us to diligently explore the sea of scientific knowledge and eventually come up with lustrous pearls of wonderful insights. Besides, the feeling is that common sense wisdom too blossoms most efficiently from the stems of selfless care for weak and fragile creatures of the world, which all humans ultimately are. This love and care could be therefore seen as an incessant fuel for the flights of human imagination towards stars. Hence, as in the Tai-Chi-Tu diagram, knowledge can be found in the center of the spinning of the vortex of love, whereas love can be seen standing at the foundation of the incessantly rising towers of human knowledge.

Lao-tzu wrote how "Heaven and Earth last long because they do not live for themselves; this is why they last forever" (Tao-Te-Xing 7), while Socrates held that "the madness of love is the greatest of heaven's blessings"[7]. St. Paul the Apostle claimed that "(Love) beareth all things, believeth all things, hopeth all things, endureth all things. Love never faileth: but whether there be prophecies, they shall fail; whether there be tongues, they shall cease; whether there be knowledge, it shall vanish away…now abideth faith, hope, love, these three; but the greatest of these is love" (Corinthians I 13:7-13), and verily, no emotion other than love could see us walking towards the abysses of life, guided by the celestial wish to enlighten people, happily reclaiming *Eo Romam iterum crucifigi*. "The systems approach begins when you see the world through the eyes of another"[8], the systems theory philosopher, Charles West Churchman proclaimed, whereby Richard Feynman pointed at the scientific foundations of Wonder and Love with the following words: "Western civilization stands by two great heritages. One is the

scientific spirit of adventure—the adventure into the unknown, an unknown that must be recognized as unknown in order to be explored... To summarize it: humility of the intellect. The other great heritage is Christian ethics—the basis of action on love, the brotherhood of all men, the value of the individual, the humility of the spirit"[9]. So, if theologies, philosophies of mind, sciences and arts were asked, most of them would clearly point at Love as the fundamental source of human creativity, underlying the beginnings and ends of the meaning of the entire existence.

Lo, as I open my eyes, I see that we are on the other side, deeply immersed in the blue and translucent waters of love, joyfully swimming with sirens and smiling dolphins, and letting the twinkly pearls from the seafloor be reflected in the starry glister of our eyes.

In view of this, I can conclude that Love can be seen as the foundation of all reasoning. It is the most liberating and exhilarating emotional state and the most powerful drive of human creativity. Such a stance clearly leads one to realize that by fostering spiritual elation, awakening creative attentiveness and intellectual curiosity and integrating our cognitive capacities, the love of Nature opens the doors to understanding her mysteries. To be a great scientific mind, one needs to approach Nature as akin to a humble virgin kneeling while a prayerful grace dwells in one's heart. Nurturing a childlike amazement and humbleness stands forth as the only way to approach mysteries of Nature and make Her let us pluck a few of the precious stars from her celestial dress and bring them down to Earth, for all to enjoy in their beautiful shine.

These picturesque analogies are here to remind us that scientific descriptions, being semi-creations of our own cognitive apparatuses and semi-creations of Nature, can be considered only as pragmatic metaphors of our experience. As Albert Einstein proclaimed, "Physical concepts are free creations of the human mind, and are not, however it may seem, uniquely determined by the external world". Scientific ideas arise where the creative imagination of ours and whatever the biophysical structures of ours predispose us for at this current stadium in the evolution of life meet the objective world as-it-is. Each time we become deeply moved or driven to tears by a piece of art, it is because we found striking metaphorical parallels between the given artistic piece and our lives. In fact, if analyzed deeply enough, each intelligible and truly meaningful impression could be seen as composed of a blend of logical and analogical threads of reasoning. A radical thesis that can be proposed at this point would be that human brain actually presents a biological device for computing metaphors, and that it is exactly this capability that made it superior compared to the remaining living species. For, the ability to reflect on one's own thoughts and perceptions is the privilege of humans in the animal kingdom, and it can be said to stand at the root of analogical reasoning which is based on finding parallels between relationships drawn at different levels in the microcosm of our thoughts. Even learning the rules of logic that later become incorporated in all aspects of reasoning is dependent on the ability to metaphorically link abstract and concrete relationships.

Henceforth, scientific descriptions can be defined not as the only possible truthful reflections of an objective reality, but as pragmatic sets of metaphors applied for the purpose of mutual coordination of experiences at the social level[10]. From such a humanistic definition of science, one could clearly see that intentions to apply these metaphors in benevolent ways and develop them for everyone's benefit underlie the profound scientific inquiry and practice. In other words, love of Nature and love of humanity are the centerpieces of science. Only when woven around the hearts beating with such love can webs of intelligence be able to lead to magnificent scientific discoveries.

Furthermore, we should know that the core of our thoughts, emotions and aspirations becomes embedded in the products of our actions in the world. Play chords on a musical instrument with the heart filled with devotion, and the music flown into the air will mysteriously shine with a grace concealed within. It is likewise with all the creative acts and events in the world.

In the end, miraculous accomplishments in life are all about great wishes that have burned within their creators. Whether we are trying to make inspiring works in the fields of arts, sciences or ordinary, casual communications, cultivation of great wishes inside ourselves presents the first step towards a successful embodiment of our visions and dreams.

Now, as we float in the bluish depths of the ocean of our mind and gaze at the heart of love lightly beating with a silent music in front of us, sending subtle waves to caress and exalt us, we realize that after wondering for a long time about where the secret of creativity in science lies, after roaming through the endless sea of human reason and patiently diving for pearls in search for the answer, we have finally found it. The core of scientific creativity is the burning heart of love. Every scientific conceptualization and every product of scientific creativity imperceptibly embeds human values, the most powerful and moving of which is Love.

The Way up: Consequences of returning to the old renaissance charm of doing science

Although we have found the core of science beating with the heart of love, our mission is not over. For, as a Serbian poet once proclaimed in his rhymes, “Exit the dream, but bring the treasures with you”, we also need to return to the daylight of being and bring forth the brilliant implications of this “loving” nature of science. As we ascend through the ocean of our mind back to the sunlit surface of our being in the world, we will remind ourselves of some of the main consequences of our findings.

The most important discovery of the empiric approach to scientific method was the very “discovery” of the method of arrival at scientific discoveries[11]. Adopting the programmatic method of reaching novel discoveries, however, resulted in slow distancing of human aspirations, passions and, more than anything, love of science and Nature away from the subjects of science and lab benches. Slowly, over time, the renaissance charm of doing science has been put asleep and science has become a coldblooded, emotionally detached entrepreneurship.

The first step in awakening that old artistic lyricism in doing research is to let scientists know that, just as in many other areas where human creativity is exhibited, the technique and know-how are at most only equally important as the great aspirations and wishes that scientific minds nourish within. Wishing that our scientific endeavors bear fruit for the benefit of a few loved creatures in the world or entire humanity is vital for a truly successful scientific practice.

Scientific reason ultimately rests on innumerable implicit and explicit assumptions, the existence of which renders scientific practice to reflect the deepest human beliefs about the nature of the physical order. Ignoring this inherent presence of beliefs as ingrained within each scientific outlook leads to prematurely and preposterously deduced conclusions based on modest sets of observations, just because being uncertain and hypothetic is banned from the language of modern science, despite the fact that this intellectual insecurity presents the essential drive of human inquiry and scientific research in general.

Yet, instilling Love in one’s approach to scientific research predisposes it to become permeated with a dose of naturalness, spontaneity and sincerity. One is then not afraid to say “I don’t know” in front of the scientific audience, knowing that finding certainty in uncertainty and

balance in the balance between balance and imbalance presents the most fruitful cognitive stance one can adopt.

If the fosterage of disciplines tends to exceed the emphasis on imagination and freedoms, robotized intellectual attitudes will pervade the scientific society, and the inertness and creative passivity will take over. On the other hand, if freedoms are instigated to exceed the extent to which the attention is focused on patient scrutiny, anarchistic attitudes and irrational and futile communications will prevail. As the former diagnosis seems to be more accurate for most of the scientific societies worldwide, contemporary students should be primarily reminded that each scientific research is to present an adventure in the relationship between human mind and Nature. Science is a quest for the treasures of knowledge, and a mind on this journey needs to faithfully reflect this pioneering epistemological nature. The personality and attitude adopted by a fruitful scientist also need to be adventurous in each of their facets.

With every new day, science and technologies are incorporating enlightening human ideas into ever more detailed and intricate pieces of inanimate matter, resulting in ever more fascinating technological devices. On the other hand, these same devices contribute to enriching the human spirit in a feedback loop wherein human creativity turns into influencing itself. Human creativity thus shapes technological tools, but these very tools are in turn shaping the human visions and concepts of the world[12]. Physical discoveries implemented in electronic musical equipment modify ways of musical thinking and expression of musicians who create pieces that influence and inspire scientists, forming a closed loop between science and arts. As such, arts have the power to reinforce our creativity which may result in even more wonderful technological tools that could be used for producing ever more captivating artistic expressions. Science and arts, knowledge and beauty are thus inextricably looped.

However, with too much of mind and too little of heart is how scientists are nowadays trained to approach scientific tasks. Science as the reign of intelligence is thus getting more and more distanced from the private lives of the scientists where most of the love resides. However, these two domains, of ratio and of emotions, could hardly ever be separated. Besides the role of intentions, emotions and other cognitive streams that flow amongst the foundations of the human mind and are involved in selections during the processing of perceptive and reflective data that our consciousness collects, metaphors that could be found everywhere around us present another connection between the social life in which scientists are immersed and their professional creativity. The greatest scientists looked for metaphorical inspiration in the natural world in solving numerous scientific problems and puzzles. Needless to say, understanding these metaphors that Nature sheds on our ways is fueled by the emotional intensity of our so-called private lives.

Moreover, fruitful scientific creativity is, regardless of how much scientists are not willing to admit this, nowadays dependent on both scientists' knowledge and intuition. Exploring the areas of chemical design, we could recognize how trial-and-error, that is, scanning through properties of interest obtained through a series of random changes of experimental conditions, are used as complementary to setting these conditions based on pure knowledge[13]. Therefore, we should rely on the powers of our intuition, intentions, aspirations and love burning in our hearts neither more nor less than we rely on the powers of logic and knowledge we accumulated over time. Intelligence is fed by love as much as our ability to love is sustained by the power of intelligence. If we do not use our heart and passions in doing science, the merits of mind alone could never reach solutions to problems it poses in front of us. In other words, unless the so-called private and professional lives start to interfere and through analogies and emotional

associations inspire each other, the doors that lead to the most exciting discoveries and revelations would be shut.

To reach the peaks of creativity, one has to fluctuate around the balance between being sensitive and receptive and being dreamy and distant. Too much of preconceptions, planning and analytical rigor and too little of relying on instinct and spontaneity can prove to be as futile for one's creativity as the opposite case, that is, too much of dreaminess and too little of systematic reasoning. We are, though, aware that we live in a world where the former attributes are fostered through education, whereby the latter are recommended in the artistic circles as the food for feeding one's creativity. But I claim that any form of creativity, scientific or artistic, flourishes while resting on the very boundary between crystal-clear analytical reasoning and unconstrained flights of fancy. The former provides limits and boundary conditions along which our mind builds ideas, whereas the latter stands for unlocking the doors of inspiration in the back of our consciousness, from which fragments of our memory will be released onto the screen of our mind and let assemble into wonderfully inspiring ideas.

Hence, if we are to make our scientific endeavors truly productive, we need to rely on strictly focused examination of logical threads comprising the models of the explored systems, but also let intuitive waves, crashing over us in the moments of relaxed reflections, frequently initiated by insights into metaphoric messages Nature has strewn in front of us, be another guidance in choosing the proper paths in our research. And if this sounds revolutionary, it is. It is a call for an upheaval in the realm of science, currently dominated by the mediocre reliance on rigid, preset algorithms on how research ought to be undertaken, that is, in purely rational ways, while ignoring to nourish the aesthetic eye for the beauty in the hearts of the explorers. It is shedding light on the foundations of science and illuminating them with the final verses of the Christ's Sermon on the Mount, which remind us that the secret of stability of any edifices of our creativity lies in the firm foundations of love.

Finally, we have gained the keys that unlock the secret of human creativity. It lies in the balance between the faculties of mind and heart. Reason and love in their togetherness yield the most magnificent features of life. If we depict our life as a ship traveling across oceans in quest for the new coasts of knowledge, the compass in our hands would correspond to the power of reason, whereby our ability to spread the sails of the ship towards ocean winds would correspond to the source of compassionate and loving intentions that dwell in our hearts. Should we start paying too much attention to what the compass in our hands has to say and forget about filling our hearts with devotion to life, we would turn out to resemble the devil from the Paradise Lost, roaming along the labyrinths of his mind in vain attempts to find the way out without referring to the transcending power of love. But once we awaken the senses of charity, empathy and a great wish to live our worldly mission for the sake of sanctifying others, we miraculously step from this insolvable labyrinth of logic into novel dimensions of our being, corresponding to the moment of Goethe's doctor Faust's accepting his human fragileness and beginning to passionately live for the sake of edifying others, thereby finally setting his spirit on the voyage to salvation.

To recapitulate, in our attempt to link the faculties of mind and heart, we have come to the conclusion that they are inextricably linked. Loving others is based on knowing and understanding them, on being able to compassionately look at the world from their eyes. Understanding others is thus the substratum of love. On the other hand, love is the one that opens the doors to insights of a bright intellect. Love is the guiding star that illuminates the right paths on our traveling along the forests and mystic lands of pure ratio. Love spreads the sails of the

ship of our being and thus enables it to use the force of the wind and travel along with the compass of ratio in our hands. Without love we would be inertly led by the ocean streams, confusingly not knowing where we are heading. But with its wings spread, we transform from an immovable cocoon that merely hides in the soiled ground to a beautiful butterfly that gently and gracefully streamlines the air. When asked by one of his disciples how he had attained such a tremendous knowledge of the nature of things, al-Bistami told a story: "When I was a child, my mom used to call me in the night to keep the doors open for her. I would open them, but was hesitant to leave, knowing that they might close under the force of a subtle wind. So, I stayed there throughout the night, making sure that the doors stay open. The knowledge I sought for so much entered through that door"[14].

Conclusion

So we see that science and wisdom are ultimately built upon the foundations of Love.

This work has been composed in a "fall to climb" manner, thereby reflecting the nature of human being in a lifelong quest for the meaning of life, which ultimately lies in finding Love.

From the arguments we have laid out on the sandy seashore during this journey of ours, we could see that the castle of science, ultimately, at its metaphysical foundations, rests on two pillars: Wonder and Love. The ceaselessly wondering spirit of adventure is on one side and the love of life, Nature and humanity is on the other. Only with hands spread to both sides could we form the bridge across which the creative ideas of ours will happily walk in their delivering great discoveries to humanity. A genuine curiosity and passion to understand the "still small voice" of Nature behind the experiential appearances, making our heart childishly leap for the stars, and a warmhearted devotion to invent things for the benefit of the earthlings thus stand as two pillars that support the cognitive bases of scientific creativity.

The most fruitful emanations of human creativity are thus lying at an intersection where the divine Love spreading its hands downwards from the Heavens to embrace and bring salvation to the earthlings meets the human Wonder ascending up, towards the starry skies seeded with the mysteries and enigmas of Nature. Therefore, Love and Intellect, passions and reason can be seen as two fundamental poles that human creatures are internally crucified upon. It is in human nature to follow both, to always seek for the balance between the two. For, it is where Wonder and Love meet that the most inventive forces in the domain of human cognition are being born.

Our journey has started on a sea shore and it will end there as well. Also, the first steps on our journey were made by our focusing on small and negligible things in life, as inspired by metaphors handed to us through some wonderful pieces of art. These artistic recollections instigated us to apply our knowledge in the right direction and come up with an inspired analogy, the unfolding of which brought us, step by step, to the destinations of our journey. Once more we could recognize how spiritual and artistic qualities are powerful drives for intellectualizations of ours, and *vice versa*.

To say goodbye to the sea, I have always used to throw a pebble into it, while wishing a wish meant to bring salvation and happiness to someone else. This time, we will do the same and the pebble thrown back to the sea will be the same one that we held in our hands at the start of our journey and let inspire the starry train of this entire discourse to ramble through our head in what might have seemed like a sudden flash of thought. Yet, magnified with a plenty of patience and scrutiny, an elaborate discourse, the one which you are reading right now, has come out of it. Looking back to our journey, we could see how enormous meanings lying hidden in tiny details

of the world are sometimes enough to trigger a miraculous chain of thought in their observers, producing ideas that will thoroughly change them and the world.

Any tiny detail of Nature can thus present the starting point for our philosophy to come to the highest peaks of human knowledge. Nature and our experience are, therefore, somewhat like a pyramid. Whatever the starting point of our inquiries, we can always arrive at its peak. In such a dependence of the development of the story of the world as a whole on the smallest of its details, science and experience may be seen as reminiscent of fairytales in which saving a flower or finding a mysterious key on a starlit floor can produce tremendous effects on the destiny of the hero dwelling in our heart[15]. Truly, as I claim, the rigor of science and the fancy of arts have always presented two sides of the coin of a truly creative human thought.

As I stood at the Ocean shore immersed in a beautiful sunset, I recalled my Mom's words: "This is where life had begun". Forever and ever, I will remain an amphibian on Earth, in an unexplainable love with the sea. As a true sailor, I could spend hours and hours looking at it. Gazing at it, I recall how the first forms of life are expected to have been initiated at the shoreline of ancient oceans, at the interface between crashing waves and mineral coasts[16]. Likewise, only where waves of flexible and imaginative Love crash against the firm coasts of logic, intellect and rigorous Knowledge can we expect to see wonderful scientific ideas springing into life.

As for me, I have changed my mind. I will not turn around and leave. I will stay here and gaze at the sea. It is so beautiful.

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