Exploration

An Exploration of the Process of Becoming an 'I' & the Quantum World of Realities (Part I)

Rajesh S. Dagli*

ABSTRACT

In this series of articles, the author analyses epistemological and ontological developments of a human being, in particular, development of an 'I' within each of us. It is postulated that each overall 'I' is an energy exchange reservoir, that is constantly interacting with infinite variety of other environmental fields, and thus itself undergoing continuous metamorphosis, exhibiting no defining characteristics for either its brain or body that are unchanged even for an instant. Thus, each 'I', is not a product, nor an entity that we all believe as remaining unchanged within each of us all through the life. Rather, it is a process - a long process running all through the life - connecting infinite states of an emerging overall 'I' from instant to instant, exhibiting innumerable avatars of 'duality' between the two extremes of a wave and a particle. Each said avatar comes into being only at the instant of an actualization interaction with an environment, which otherwise remains non-existent. The study concludes, perplexingly and painfully, that each 'I' is as much a quantum-like process as that of an atomic particle.

Part I of the four-part series of articles includes: Introduction; 1. Does God Play Dice? Yes and No; 2: Cartesian World View; & 3. Human Behavior & Consciousness.

Key Words: Human being, Consciousness, process of becoming, interaction, environment, actualization, quantum-like, quantum reality, I.

Abbreviations

CCES - Cumulative Consciousness Energy Spectrum
FORs - Frame of References
MCRM - Mechanism of Compatible Rates of Metamorphosis
ROCA - Realm of Consciousized Aggregates
SCAR - Subjective Component of an Actualized Reality
SSG - Super Scientist-God
UCAR - Universal Component of an Actualized Reality
UOR - Ultimate Objective Reality
UOROI - Ultimate Objective Realm of Interactions

Introduction

In this series of articles, the author analyses epistemological and ontological developments of a human being, in particular, development of an 'I' within each of us. The study begins by bringing to the fore certain ambiguities involved in extending the Cartesian definition of Reality to all 'things' in our normal world views. In particular, the rationality behind extending the same

*Correspondence: Rajesh S. Dagli, Independent Researcher. E-mail: rajeshsdagli@gmail.com

to man-made ‘things’ like a school, nation, song or painting, as these all do not seem to have truly objective properties to qualify as Cartesian realities, existing ‘out there’ independent of the observer, as for example the table, the trees, the moon, etc. Then, further analysis at the deeper levels in the study ends up with a proposed consciousness mechanism that leads to an inference that even the latter, ‘hard core things', are not truly objective realities.

This study proposes consciousness as an inherent automatic process present by default in all living beings that lets them identify and define the realness of an interacting environment *only* in terms of the basic survival instincts of pleasures and pains. Thus, the brain's energy, proposed to be termed as 'consciousness energy', used in each actualization of a reality, is directly proportional to the Realness of the environments as defined in terms of its impact on the survival by the actualizing brain. The nature of this reality, whether pleasure or pain, is determined *equally by both*, the mutually interacting brain and the environment in their respective states, thus each actualized reality connects the mind and the matter at the instant of actualization. It is further contemplated that all realities in our Cartesian world views, whether pertaining to man-made ‘things’ or to the natural ‘hard-core things’, are all effectively the actualized realities of pleasures (or pains).

Thus, they all are inherently subjective in nature. Conversely, it implies that the true objective nature of any reality is outside the purview of human consciousness. And since all such subjective realities are brought into existence only as an outcome of an actualization interaction and otherwise, are non-existent, they are like quantum realities. On the other end, at the levels of ultimate objectivity, it is postulated, there does not exist any 'thing'-animate or inanimate, not even an independent, freely willing 'I'; and what *only* 'exist' is one whole universe of interactions, happening among infinite energy fields interacting with each other perpetually in a timeless world, each of them undergoing continuous metamorphosis, making it impossible to demarcate and define any field as existing even for an instant.

The study conjectures, how for a same human brain, from such an objective realm of interactions, various realities of a Cartesian world, a quantum world, and most important, of an 'I' get actualized at different levels of subjectivity by the virtue of a proposed mechanism of compatible rates of metamorphosis likely to exist between certain fields of this objective world.

Further analysis of an 'I' in the study, starts with splitting the overall, aggregate 'I' -as observed within the Cartesian frame, into its two components, a physical 'I' and a mental 'I'; and dissections of both, down to their root levels, reveal that the physical 'I' is emerging from the infinite instantaneous energy exchange interactions, viz. the metabolic reactions with the environments-within and without the body. Likewise, the mental 'I' is emerging from the infinite actualization reactions with the environments, which are based upon the consciousness energies.

In either of the cases, the brain, on repetitive interactions with the same or similar environments, identifies those which are pro-survival from those which are anti-survival, and constantly develops skills, (both mental and physical) so as to get adapted to all for survival. Thus, from time to time, a spectrum of all those actualized realities of both pleasures and pains, and also of all those skills gets continuously developed within the brain, which acts as a spectrum of potentialities for all future interactions with the ever changing environments-which may be

presented by a spectrum of probabilities. The two spectra are constantly evolving in time, and at every interaction between the two, the reflex adaptive actions by the brain are but what we observe as the behavior of an overall 'I' in our Cartesian frame.

Thus, it is postulated, each overall 'I' is an energy exchange reservoir, that is constantly interacting with infinite variety of other environmental fields, and thus itself undergoing continuous metamorphosis, exhibiting no defining characteristics for either its brain or body that are unchanged even for an instant. Thus, each 'I', is not a product, nor an entity that we all believe as remaining unchanged within each of us all through the life, but rather, is a process - a long process running all through the life, connecting infinite states of an emerging overall 'I' from instant to instant, exhibiting innumerable avatars of 'duality' between the two extremes of a wave and a particle, with each avatar coming into being *only* at the instant of an actualization interaction with an environment, which otherwise remains non-existent! The study concludes, perplexingly and painfully, that each 'I' is as much a quantum-like reality, as is any atomic particle!

1. Does God Play Dice? Yes and No

Our normal view of this world consists of things existing 'out there' whether we observe them or not. There are railway stations and airports, streets, highways and expressways, lakes and rivers and mountains, the planet earth, the stars and galaxies … and so on. Then there are also 'things' like people, families, societies, associations and unions, schools and universities, states and nations, … and so on. This whole world view is based upon a fundamental notion that the nature of the objective world 'out there' is knowable and definable in terms which are not subjective. This notion also forms the very basis of defining the term Reality, which may be broadly stated as: The Reality of a 'thing' can always be defined in terms of its certain properties that can be measured uniformly and unambiguously by all observers and hence the reality expressed in terms of such properties is truly an objective reality. Well, the human progress in all branches of natural sciences may be cited as the proof to support this notion, but certain developments in particle physics in early twentieth century gave first jolts to this basic paradigm and paused an important question on the above meaning of Reality.

These ground shaking developments started with discoveries of Max Planck in 1900, and culminated with quantum mechanics as propagated by Niels Bohr, Werner Heisenberg, Wolfgang Pauli and others around 1925. The shocking revelation of the quantum mechanics was that the matter which by itself as an aggregate exhibits properties that can be studied objectively failed to exhibit any objective properties at its atomic or sub-atomic levels. In fact, at these levels, an atomic 'particle' exhibits properties that are no more independent of measuring systems or the observer, which means moving down from aggregate levels to the levels of its building blocks, the objectivity is getting lost in a very strange way. As if, a solid thing like a log of wood evaporates at its elemental levels into *something* like energy fields depicting 'no-thing-ness', as (because) *inherently*, that *something* are neither particles nor waves! Only at the instance of a measurement, either a particle or a wave comes into its being as an outcome of an interaction with the measuring system; prior to that, according to quantum mechanics, what 'exist' are only a set of probabilities for each possible outcome, the probabilities being dependent

upon the properties of the measuring system as well. The startling conclusion was that the atomic and sub-atomic 'particles' do not have an objective existence that can be described without any reference to the measuring system! The clear Cartesian partition between the object 'out there' and the subject 'in here' became questionable. The quantum experiments revealed that the object and the subject, at the instance of a measurement would become, in the words of David Bohm (1917-1992)- the famed American theoretical physicist, an indivisible whole, which cannot be further analyzed at any deeper level keeping the partition line intact. (Bohm D., 1951, pg. 161.) Thus, the outcome of the experiment is due to both, the state of potentialities of the 'particle' and the probable states of the measuring system/observer. The objectivity aspect of the basic paradigm which hitherto was the very foundation of the classical physics and all other sciences was challenged by the quantum mechanics. The discoveries led to new questions like: Do we really know how much we know about the nature is truly objective? Or more precisely, how much is not knowable objectively in principle? If the macroscopic world can be viewed from Cartesian frame and thus can be split into independently existing 'things' as objective realities, why the very building blocks of the same fail to exhibit any inherent objective properties that are independent of the measuring systems? Put conversely, if Cartesian paradigm fails at sub-atomic particles and if these are the building blocks of the matter, application of the same paradigm to macroscopic world should be erroneous, and if it is so, why the error has nor surfaced in any of the sciences developed so far? Many such questions surfaced during the historical developments of quantum physics during the early decades of twentieth century, which probably could not be answered in unambiguous terms even by the proponents of the new physics.

In light of such paradoxical questions, the quantum mechanical developments turn out to be incomprehensible for many scientists including Albert Einstein, Max Planck, and Erwin Schrodinger. Their main argument was: How can centuries old Cartesian system of knowledge be shaken up fundamentally and so easily? At the same time, the opposite camp of proponents of quantum mechanics was also not devoid of confusion, which mainly hovered around a new quandary : The age old concepts of classical physics cannot explain a quantum event unambiguously, hence the same need to be replaced by an alternative paradigm that necessarily uses a language not based upon the Cartesian world view. But then, such a new language, if at all it can be invented would, in turn be simply unintelligible for a human mind which is conditioned to think in, -and only in-the Cartesian mode ever since the time immemorial! Hence, in the Copenhagen Interpretation, the classical concepts were accepted as the only course left to explain the outcome, however ambiguous that may be, thus leaving this paradox- the Measurement Problem- unresolved. But nevertheless, the quantum developments did make the Cartesian line between the object and the subject blurred forever.

So at the sub-atomic levels, the subjective element becomes so prominent that a particle can be turned into a wave and a wave into a particle by choosing an appropriate measuring instrument! What is the true nature of 'it'? Well, the true nature of 'it' will never be known, because *inherently* 'it' doesn't exist! Hitherto, the term Reality was very widely used to mean an Objective Reality that is existing 'out there', (- and in fact, it is even today widely used in the same meaning in our common sense world views); but for the first time, the scientists, while working with the atomic realms, were forced to differentiate between the reality as observed by us on one side and truly objective reality of the nature on the other side; and not only that, the

quantum mechanists also realized rather more shockingly, that this truly objective reality is, in principle not knowable!!

How About Very Large Realms of Nature?

The sub-atomic realms are not the only realms that cannot be studied objectively, there are many other realms of the Nature which also cannot be studied objectively, but for the different reasons altogether.

Most of our scientific studies and research are based upon the methods of abstraction. We study a 'thing' of nature -be it a product or a process, by studying it in a laboratory, thus isolating it from many other forces or energies that might be actually existing in nature. The causal laws thus formed in the laboratory would be valid for actual natural world only under limiting conditions, and hence, they are always inaccurate to certain extent. This inaccuracy is directly dependent upon the degree of closeness between the actual conditions in nature and simulated conditions in the laboratory, thus we can expect to have very insignificant inaccuracies when the two conditions match closely well with each other. All products and processes studied and developed in various branches of sciences are the results of such laboratory experiments performed under closely matching simulating conditions.

And the scientific progress of the human kind in the last three centuries was at such an accelerating pace, we started believing that anything and everything in the natural world can be objectively studied by using the same methods of abstraction, and thus the very concept of Reality got gradually extended to even those things and objects which are beyond the scope of scientific research based upon such abstraction methods.

For example, there are certain natural phenomena, certain natural 'things' whose very form and structure are such that they just cannot be simulated in the laboratory. The most striking example of such a case is that of weather. We just cannot simulate *actual* weather conditions in its *totality* in a laboratory. Any effort in that direction is nothing but a very heavy compromise of its overall universal totality. The amount of error involved in such an effort would be far from insignificant. Hence, even with all super computers at our disposal, weather predictions over longer time periods are far from accurate. Other examples where scientific studies by abstractions and simulations would fail are, ecology, studies of epidemics, biological and life sciences etc.; in all these fields, we face problems like predicting and/or determining causes and conditions for species either going extinct or being produced anew, predicting or determining causes of onset of an epidemic or onset of a new disease, or even- on a smaller scale, determining root causes for incidence of a particular disease- be it the common cold or a deadly cancer- in a particular person at a particular point of time.

In all the above examples, the actual conditions are highly complex due to very large number of forces and energies simultaneously working on each other making it nearly impossible to simulate the conditions even in the most elaborate laboratory set-ups. To understand the complexities involved in these kinds of phenomena, let us take a simple experiment. We take five uniform lengths of mild steel wires cut from the same coil, and are hung in the air in five locations in different continents with an identical weight tied at the bottom end of each wire. The

uniform weight hung is so calculated that the wire will break away when reduced to half its diameter under corrosive atmospheric conditions, and this is estimated roughly to take about a year or so. Can the modern science, with all the available data on the composition of the wire, and also the data on atmospheric conditions as at the time of onset of the experiments in five locations predict the exact time correct up to seconds, if not milliseconds, when each wire would break up? It's very unlikely. But if the same experiment is conducted in a laboratory with all conditions controlled and known, the prediction could be very accurate, probably even in milliseconds. In the outdoor experiment, the atmospheric ripple effects which otherwise are discarded off in the laboratory experiment, become significant forces under natural conditions, making it extremely difficult to predict an outcome. It's not that the basic causal laws of science fail in such cases, but it's the fact that enormous ripples turn into forces that have direct impact on the outcome when we experiment in actual environmental conditions with particular objects, which makes the true objective predictions impossible.

Well, study of all the large realms are, in one way or the other, study of the Nature in its Totality.

Ultimate Objective Reality and Totality of Nature

Let us go back to the example of weather. Let us imagine that there is an omnipotent omniscient Super Scientist-God well above our planet who at any given instant knows the exact values of all relevant parameters that are required to define exact status of the weather in every smallest 'pockets' of the entire globe. Let us also assume, that this Super Scientist-God also knows by his super powers, right at that moment, nature of all the energy reactions-*without interfering them in any way,* that are happening all over the globe which all would impact those parameters-either directly, or indirectly through ripple effects- in each of these 'pockets' in the next instant; thus enabling our SSG to determine accurately the changes in all the parameters in each such 'pocket' in the next instant; and integrating them all, can also determine exact changes in the weather in the whole of the planet in the next instant, and then in the next instant …and so on, for any time in the future. Thus, from the point of view of SSG, the causality holds good for all these interactions at every level in the universe, and that the events in nature and universe are determinate, continuous, local and…., -that the God doesn't play dice!

The emphasis in the above hypothetical example is on the non-abstracted totality of the nature that consists of infinite interactions enfolding the whole of the planet and also all animate and inanimate matters in its totality. In fact, there are no distinctions between such matters, as such there is neither any description of any macroscopic product or process nor any for a microscopic or sub-atomic 'particle', all these are expressed *only* by infinite energy fields of innumerable kinds, which all interact with each other every instant undergoing perpetual metamorphosis through innumerable interactions. These are the fields that corresponds to organic and inorganic matter, to living and non-living matter, to sub-atomic, atomic and macroscopic aggregates, hence there are infinite energy fields, all overlapping each other when multiple of them interact with multiple others simultaneously in a highly complex way, which results into infinite number of instantaneous energy transformations resulting into newer energy fields, which again enters into newer interactions and so on and on. The whole scenario is so complex, we, with all our super duper computers put into the service, shall never be able to study the nature in its totality. And also, since there are no 'things' definable in terms of our classical physics, there are no reference

frames either to define order or disorder, matter or non-matter, living or non-living, there are only energy fields and their transformations happening at all levels, and these all are controlled by causal laws pertaining to energy transformations at the root levels. Well, this in nutshell is the Ultimate Objective Reality ("UOR").

The question is, can we, the human scientist, attain the levels of Super Scientist-God ever in future, and know the UOR in its totality? No and would never, mainly for the following three reasons:

a. The human scientist does not have non-interfering measuring systems to collect required data at all levels in all the matters of the entire planet without having any interaction with the observed energy fields. Nothing can be observed unless there is an interaction between a measuring system and the observed. Not only this, as we will see in the latter part of the study, there are entanglements further down the line, between the measuring system and the interpreting system-or the consciousness faculty of the observer. These are all inevitably entangled energically with each other, hence affecting the ultimate objectivity.

b. There is enormous complexity involved in the study of UOR in its totality. Even if we put aside all above entanglements for a moment, neither the present day science nor in future would any time have the means to study *simultaneously* the infinite number of reactions happening in each of the infinite number of 'pockets' in the entire universe that would have impacts on the relevant parameters of the nature in an infinite direct and indirect ways. The UOR in its totality is simply beyond the scope of the human beings.

c. The third reason, and probably the most intricate one, it is difficult to determine the nature of the highly unpredictable forces that may spring from accidental alignments of ripples effects.

Bohm, while discussing inadequacy of Laplacian determinism, says, (Bohm D., 1957, pg. 159): "We see then, the behavior of the world is not perfectly determined by any possible purely mechanical or qualitative line of causal connection. This does not mean, however, that it is arbitrary. If we take any given effect, we can always in principle trace it to the causes from which its essential aspects came. Only as we go further and further back into the past, we discover three important points: viz. first, that the number of causes which contribute significantly to a given effect increases without limit; secondly that more and more qualitatively different kinds of causal factors are found to be significant; and finally, that these causes depend on new contingencies leading to new kinds of chance."

Hence, the human mind has no alternative than to interact with an abstracted version of the UOR at a particular instant, and assess its overall state by extrapolating the results of abstraction. Thus, the two states assessed this way spaced out on a time scale would certainly be discontinuous, and non-causal; and also the state of UOR for any other instant in future would always remain indeterminable. The God, for us, does play dice!!

2: Cartesian World View

The basis of human world view for the last several centuries has been Cartesian partition,-the God, The World and the Observer-'I'. Even in earlier times, in Stone Age too, there existed a world view based upon the 'things out there' that is either good or bad for the survival of 'me over here'. The root of such differentiation lies with the basic inherent pleasures and pains experienced exclusively by the observer 'within' its body in an interaction with the environments which all are 'without' the body. Well, it is this subjective experience of pleasures and pains that enforces any living creature to differentiate between the environmental 'things' around him and thus form a world view partitioned among the 'things' of pleasures and pains on one side, and 'I' on the other side; a partitioned world view that is so vital for the very survival, and hence is a most common feature among all the living creatures. Put differently, in absence of these basic instincts of life, the living creature would fail to identify a particular environment as being pro-survival or anti-survival, and thus, would also fail to precipitate a flight or fight action. Whether in stone age or in the modern times, every human endeavor to know the nature and the world around him has always been an automatic fall out of such survival instincts, thus automatically forcing a demarcation between a 'me' and the rest of the world in every interaction. Over the ages, however, there has been an enormous change in both the qualitative and quantitative nature of the pleasures (and pains), but nevertheless, they remained fundamental instincts of life for all living beings in all times. With changing times, the earlier stone age demarcation line gradually became an elaborated framework to describe the basis of human model of thinking in dealing with nature. This framework, came to be known as Cartesian framework after the French philosopher Descartes, describes a basis which remains, for the reasons as explained, the only and most natural way of dealing with the environments for any human being in all ages to ensure his/her survival. Thus, it forms the commonest basis of all world views of all human beings held at any time. The three main aspects of the Cartesian world view are : 1. The physical things 'out there' are objective realities, whose properties are independent of the observer/subject 2. In the same way, the subject-'I' is an entity whose properties and existence are independent of the things 'out there'. 3. The link between the physical things and 'I' is God.

However the new science, as discussed in the previous section, forced the scientists to start thinking in a Non-Cartesian way, insofar as the world of atomic particles is concerned. Otherwise, for the human mind which continued to be a 'prisoner' within this Cartesian frame, found it very difficult to think that there could be systems and 'things' in the nature that cannot be defined as objective 'things' within this Cartesian frame, and hence that, no causal laws can be formed, developed or applied to such 'things'. Werner Heisenberg (1901-1976), the German Nobel laureate, and co-creator of quantum mechanics along with Niels Bohr, expresses this difficulty as follows, (Heisenberg W. 1958, pg. 55) : "If one follows the great difficulty which even eminent scientists like Einstein had in understanding and accepting the Copenhagen interpretation of quantum theory, one can trace the roots of this difficulty to the Cartesian partition. This partition has penetrated deeply into human mind during the three centuries following Descartes and it will take a long time for it to be replaced by a really different attitude toward the problem of reality".

Having analyzed the impact of Cartesian thinking on human mind in general and resulting paradoxes in the study of small particles, we now turn to the other extreme, the realms of larger

systems. We, in the previous section, have already touched upon weather as a large system, now let us analyze the impact on man-made systems like a family, nation etc. Once again by default, in all these realms too, we view all 'things' as if they are all physical objects standing 'out there' having a set of objective properties, which are measurable by all observers alike. Thus, reality of India as a nation or reality of a football team or of a painting or a song is all unambiguously as real as an apple in our hands.

Let us take an example of a school. The most immediate physical manifestations of a particular school are its physical structures, e.g. administrative offices, class rooms, laboratories, etc. But these are just its physical manifestations, there are many more aspects –and far more important too, to completely define a school in its totality; like its education philosophy and policy, its curriculum, its faculty, caliber of principal and autonomy he/she enjoys, investor's interests, fee structures, extra-curricular activities, status of laboratories and libraries, pay scales and health care for its employees, etc. Now, when different persons interact with this school in their different capacities and for different reasons, each one of them would experience only a few of those attributes relevant to their individual interactions, and no one can experience all the aspects simultaneously in one interaction; and it is from such truncated versions that each observer by extrapolation would actualize an overall image of the school.

Thus, not only that each such extrapolation has inherent errors, but each is also very subjective. So no two actualized realities of a school are likely to be identical in all aspects, but at the same time, each individual version would have some commonalities like the name and location of the school, its physical structures, play grounds, etc. And it is by virtue of such commonalities that all observers tend to believe that each one is observing same reality of a particular school existing 'out there', in spite of the fact that each one's version of actualized reality is different from all others. For example, the investor assesses the school as a revenue generating asset, and thus 'measures' it with the returns on his investments, but then with the same yardstick he cannot 'measure' the quality of the education being imparted in the school, which can be 'measured' correctly only by an educationist, say the principal of the school, but then the principal in turn will not be a good judge on its returns of investments!

So a particular school may be very good by one yardstick, and 'the same' could be very bad by another yardstick! This means the actualized reality of the school is 'yardstick' dependent, or is simply subjective. Which of these versions is the truest representation of the school as an overall entity, existing as a reality out there?' None, whatsoever, because all the assessments are subjective and not only that, all being extrapolations to a certain degree, are also approximations too. Put differently, the school as a whole, as an entity in its entirety, cannot be 'measured' and assessed for all its attributes alike by all observers.

Precisely speaking, for each observer, the extrapolated overall reality of the school is a reality that has come into being *only* out of an interaction of each observer with the school, and this extrapolated reality otherwise was simply non-existent, and would have remained non-existent forever in absence of any such interaction. We all up to a certain point, may concur that all versions are subjective and bound to differ from each other, but in practice, we do not extend this concurrence any further to question the very existence of the school as an objective reality. The main reason being, the commonalities like its name, the physical structures etc. are enough to

provide physical manifestations required to actualize the reality of the school as an objective reality standing out there, because all such physical manifestations are sensed and perceived uniformly by each observer .

But certainly, the school as a whole is much more than what meets our five senses, and this 'much more' is rather more important to assess the school than the physical structures alone. But then, this 'much more' part can only be assessed subjectively, or put differently, the 'much more' part of a school doesn't exist as objective reality; it comes into being only in an interaction. This means, most important part of the whole, -the whole which is believed to exist as an objective reality, doesn't exist as an objective reality! The logical lacuna associated with our basic paradigm of thinking is thus concluded.

In the same way, the reality of India for a tourist would be different in many ways than that for any of its citizens, and again in turn, the reality would be different for an urban, rich citizen than that for a poor villager. If for all these three people - or for that matter for any assessor of any kind whatsoever, the reality of India is so different, the question is what is Real India? Nobody knows, nor at the same time, would they agree that they all are talking of different Indias! We may conclude that when dealing with such large systems, either our common sense meaning of the term Reality needs to be redefined precisely in more subjective terms, or accept the fact that a school or a nation per se just does not exist as a reality 'out there' in our sense of the meaning! Hence in all such cases, if we still wish to hold to our Cartesian meaning of reality, then only conclusion that can be drawn is that the reality of a particular school or a particular nation just does not exist, which means India or the USA are imaginary entities!

To summarize, we discussed how in the quantum world, the entanglement of the observed and the measuring system makes the objective studies impossible, while in case of the nature exemplified by weather or ecology or any such large natural systems, it is their sheer complexity that rules out any possibility for an objective study. We also saw, in man-made large systems, objective assessments are not possible largely because of the problem of entanglements. We shall now see that in case of studies involving living beings and their behaviors with the environments, we are confronted with both the problems, viz. the problem of entanglements as well as the problem due to complexity. To understand this, I propose, we start with the behavior of a new born baby.

3. Human Behavior & Consciousness

A newborn baby belongs to the entire universe. For her, she is neither an Indian nor an American, neither a Hindu nor a Muslim nor a Jew. She is not black, nor white, nor brown. She is none in particular, and she is all in general. Hence, she belongs to all uniformly, or put differently, she does not belong to anyone particularly. However, this universalized state of hers doesn't last long. As for any normal infant, she has pains of hunger, and also the pleasures of being fed, of being loved and cuddled, again and again. She slowly recognizes a face as having consistently associated with these pleasures. This correlation becomes stronger and stronger with each feeding session, and with each act of loving and hugging. A causal connection thus automatically gets established in her little brain, in due course of time. Very soon, it reaches a

stage when at each instance of sighting this face, there is a sparkle in her eyes, smile on her tiny face, with her little arms raised in the air as if to embrace this face instantly. All such small acts and expressions are like embracing that reality- a reality identified as a source of pleasure, love and warmth. The mother's face would become invariably the first reality in her life distinctly identified and memorized as a source of pleasure and protection among many other faces around her. She now belongs to this face more than the rest of the universe!

Our baby is put on a regular ayurvedic tonic of *harade*, which is very bitter in taste. Normally given three times a day, the baby starts correlating the spoon containing *harade* with its very unpleasant taste. With repeated dosages, the causal connection is complete, and the baby now, on the very sight of the spoon, instantly starts crying, then turns away her frowned face with tightly closed lips in total resistance. All these acts are to avoid the reality of *harade,* which has been by now, well identified and memorized as a source of unpleasantness. Well, the baby now doesn't belong to all uniformly any more, she belongs to some little more positively, and to some little more negatively.

What triggers the action when the baby sees her mother approaching or when she smells or sights the bitter medicine in the spoon? It's the small bit of information reaching the brain which acts as a trigger to recall an identical or equivalent reality from the recent past experiences- associated with a pleasure or a pain, in its entirety, which inadvertently results into a physical reflex reaction by baby, either to embrace to avert the approaching environmental change. This entire process of triggering and recalling, including the instantaneous reflex action to embrace or to avert is automatic, as automatic as the digestion process in her tummy.

The baby would slowly have more and more interactions with all sorts of environments during her wakeful hours, every minute, every second. She is exposed to 'things' like siblings, to neighborhood kids, to various kinds of people of all ages, and of all colors and contours; and so also to all kinds of material 'things' like foods, drinks, medicines, toys and games, etc. Not all of these are pleasant, nor all of these are unpleasant. In either case, whenever there are enough number of repeated encounters, invariably a causal relationship between the thing and the associated pleasure or pain gets established. The thing along with the nature of pleasure or pain gets automatically memorized, in such a way that the nature of pleasure or pain gets interwoven with certain physical characteristics of that object to become one whole inseparable reality, that collectively goes as a bundle into her memory. We may repeat, this process of memorization of realities interwoven with the pleasure or pain is very automatic. To be more specific, there are no conscious efforts by baby to memorize certain realities and not to memorize certain others, either of the two are happening very automatically, as automatic as the thumping of her heart.

The human memory has certain 'shelf-life', and hence the memory of a particular thing tend to fade out automatically with time in absence of any more repeated encounters with the same. With constantly changing environments thus, those 'things' with decreasing frequencies of interactions, automatically get replaced by newer ones having higher and increasing frequencies with time. With growing age, the spectrum of realities in the memory is constantly changing both qualitatively and quantitatively depending upon the rate of the change of the environments and also upon the cognitive abilities of the brain, which also is developing and changing with time. But at the same time, there are certain realities e.g. of the parents, of the home, of the school, etc,

and above all, of her own image in the mirror, these all are sort of permanent in her memory just for the simple reason that the interactions with all these realities are continuous with time without any long breaks.

Physical & Mental Skills

With growing age, the child learns various skills by just imitating the elders around him/her, and this is how she learns to take her first steps, learns to utter words like 'ma' and 'pa', and even learn to speak full sentences by an age of around three, without undergoing any formal training. The child repeatedly experiences that every new skill he/she learns is well appreciated by all elders around him, and each such appreciation by itself becomes a newer kind of pleasure for him/her. (And most children, we have observed, tend to repeat a particular act again and again in presence of elders to have repeated pleasures of appreciations.) Very soon, a correlation between the skills learnt and the associated new pleasures automatically gets established in the young brain, and thus develops inadvertently a continuous inner urge to have more of such kudos by learning more and more newer skills. The kind of urge for newer skills is akin to her craving for the very yummy foods he/she has experienced in the past. And as we mentioned in the preceding paragraph, the same pleasure-driven mechanism by which the child grabs the pleasant foods in a reflex manner, works in the same reflex way to grab every new opportunity to learn a newer skill.
The mechanism of repetitive interactions holds valid not only for the basic skills learnt during formative years, but it also provides an underlying functional mechanism by which a human brain learns more complex skills all through the life.

Whenever the brain starts learning a new physical or mental task, higher level of attention is demanded, and once the task is learnt, with every subsequent repeated rehearsal, both the time to complete the task and the attention level required will keep on reducing. With enough repetitions, a stage is reached, when the required attention reduces down to near zero levels. At this point of time, the skill goes into the sub-conscious realm of the brain from where it gets performed very automatically without the brain consciously being aware of the same. Once a particular skill is mastered, the same goes into the automatic mode of performing and the brain can turn its attention to learn another new skill requiring higher attention levels, by *simultaneously* putting to use all those (lower level) skills mastered earlier and now being used in their automatic modes, the cycle, thus, goes on and on.

Martha Koukkou and Dietrich Lehmann, Swiss neuroscientists, have reported research correlating changes observed in EEG patterns at various stages of learning newer skills,(Koukkou M. and Lehmann D. 1993, pp.61-62): " It was found that the dimension of the initial EEG reactivity to "new" information relates to the quality of learning; it changes systematically as a function of changing contextual meaning, expectancy and familiarity with the event. During learning and overlearning the information-induced EEG changes (the dimension of EEG reactivity) decrease with increasing familiarity with an event and a task; that is with better performance. The EEG reactivity is minimal or even abolished when the training procedure reaches automatic behavioral responses."

Cycle of Behavior

At any instant, when the brain receives an information coming from environments within or without the body, with regard to certain changes in the environments, the same triggers the memory to recollect from the past experiences same or similar environmental change in its entirety, and subsequently, the same gets automatically sorted out into a probable reality of either a pleasure or a pain; following which- by using a mastered mental skill, the one which is visualized as of the highest (probable) pleasure or of the least (probable) pain gets automatically selected for actualization. This, in turn, triggers a particular reflex action –automatically selected as appropriate for that situation from the past experiences, and the same executed instantaneously using the learned physical skills to actualize the selected reality. Now, following the reflex act, subsequent changes in the environment may turn more positive, more negative or neutral from the point of view of the targeted pleasure or adaptability in this entire cycle of interaction; the same, along with some independent changes in environments that may occur in the next instant, comes collectively as the next bunch of information into the consciousness faculty, triggering a new cycle of interaction, following the same pattern. It should be noted that in the entire cycle of behavior, the emphasis is on automaticity.

Bohm expresses similar viewpoint, (Bohm D. 1980, pg. 64): "One of the earliest and most primitive forms of thought is, for example, just the memory of pleasure or pain, in conjunction with a visual, or olfactory image that may be evoked by an object or a situation… It is clear, however, that the *whole meaning* of such a memory is just the conjunction of the image with its feeling , which (along with the intellectual content and the physical reaction) constitutes the totality of the judgment as to whether what is remembered is good or bad, desirable or not, etc. It is clear that thought, considered in this way as the response of memory, is basically mechanical in its order of operation. Either it is a repetition of some previously existent structure drawn from memory, or else it is some combination arrangement and organization of these memories into further structures of ideas and concepts, categories, etc. These combinations may possess a certain kind of novelty resulting from the fortuitous interplay of elements of memory, but it is clear that such novelty is still essentially mechanical." (Italics as in the original).

Each such cycle of interaction, operating totally in an automatic mode, fundamentally works on the basic instincts of survival, which ‘decides’ in the first stage, whether the environmental change is good or bad for its survival, or being pleasant or unpleasant *with respect to its past experiences,* followed by, in the second stage, a reflex act to actualize or de-actualize the reality of the same. I may propose to call this cycle as Cycle of Consciousization. In the English language, there is no verb equivalent for 'consciousness', and since in the present study, consciousness is defined as a process, the need for such a term is unavoidable. Hence, to *consciousize* would mean to become conscious of, and *consciousization* would mean a process of becoming conscious of. In the more precise meaning, as described above, consciousization is a default mechanism, present in all the living beings, that is solely responsible to help them develop adaptive skills under all circumstances vis-a-vis ever changing environments so as to maximize their chances of survival, and/or to maximize the pleasures and minimize the pains.
This mechanism of behavior based upon the basic instincts of pleasures and pains is very fundamental and common to all living beings across the board in any age, at any time whatsoever. Why do these basic instincts exist in the first place? No science probably would ever

get an answer to this question, for the simple reason that no experience of any pleasure or a pain can further be analyzed to any other lower level in order to get an answer for its causes. Pleasures and pains are there, simply because they *are*, period. To that extent they would always remain mysterious forever.

In a way, this fundamental cycle of behavior comes very close to the concept of *collective unconscious* , and the basic instincts of pleasures and pains, probably qualify as *archetypes;* as postulated by the famed Swiss psychiatrist Carl Jung (1875-1976) in his analytical psychology. According to him, the collective unconscious is the common pattern that controls human psyche in all cases. Its correlation with proposed consciousization cycle may be visualized by the following narration on the collective consciousness and archetypes given by Miller A. in "When Pauli met Jung", (Atmanspacher H. & Primas H., 2009, pp. 247-248) : "Unlike Freud, Jung was interested in aspects of the psyche that could not be attributed to individual's personal development but to the deeper non-personal realms common to humankind- the collective unconscious, whose contents he called 'archetypes'. These are not inherited ideas, rather they are latent potentialities whose origins remains forever obscure because they reside in the mysterious realm of collective unconscious about which we will never have direct knowledge. Whereas the archetype itself is not representable, its effects enable to visualize it as an archetypal image, or symbol. Archetypes are hard-wired into the mind and serve as organizing principles allowing us to construct knowledge from the potpourri of sensations bombarding us. "

The research paper by Koukkou and Lehmann, (Koukkou M. and Lehmann D., 1993, pg. 59), draws conclusions that are very much in line with those described above in regard to the functional mechanisms of a human brain: " Summarizing one can say that the operations of the cycle of communication generate and coordinate all dimensions of human behavior. These operations can be analyzed into three continuous, interdependent, dynamic, and complex sets of operations where each set depends on the previous one and initiates the next one. All three sets of operations are knowledge implemented. That means, their characteristics depend on the kind of previously acquired and momentarily accessible knowledge of the individual. These sets of operations are (1) the creation of multidimensional neuronal model of the internal and external individual realities out of the interaction between incoming signals and momentarily accessible knowledge (pattern formation) (2) the evaluation of significance of these realities for the momentary psychobiological priorities by matching against accessible knowledge (pattern recognition); and (3) selection and execution of the answer, which is a functional psychobiological adaptation to the recognized significance of these realities. The answer is relayed back to the central nervous system and together with new incoming messages participates in the formation of the next model of realities, and so forth."

The seemingly so variant and complex behaviors of all human beings, controlled or not controlled, aimed at long time goals can in fact, at the root levels be split up into umpteen numbers of instantaneous consciousizing interactions, one each for each of the innumerable unitary acts of ‘go/no-go’ types, ‘go’ for pleasures, ‘no-go’ for pains; each of which has been mastered by repeated encounters in the past, and hence all such acts are executed instantly in a reflex mode, thus we can say that the entire overall complex behavior is also executed very automatically and unconsciously. Since, each complex task is but a different combination of such innumerable unitary root level acts or the skills mastered in the past, the complete automaticity

of human brain's functioning applies to all kinds of human behaviors. What is being suggested here is a simple mechanism by which a human brain operates, whereby seemingly complex functioning of the brain at the aggregate levels can be reduced down to a simple on-off mechanisms operating at the root levels of neurons. The future research in this field may be able to correlate each such unitary act, as executed by on-off firing of a particular bunch of the neurons(-and probably the same bunch of neurons in every repetitive act), with each peak on real time EEG of an active brain. During the wakeful and very active hours for a person, the number of elementary acts being performed (either physically or mentally) per unit time increases by manifold as compared to sleep hours; and this is what exactly reflected in the corresponding EEGs. For example, the lowest frequency EEG is called Delta, having a frequency as low as 4 Hz, and is normally associated with babies and adult sleep states, and on the other extreme are highest frequency EEGs, known as Beta(16-31 Hz) and Gamma (32-100 Hz) and are those found in very active states of adults.

Koukkou and Lehmann contemplates even more close correlations between the human brain's micro-states, which constitutes its overall macro behavior, with the micro-structure of the EEG. They report, (Koukkou M. and Lehmann D., 1993, pg. 64): "Our studies on this micro-structure of the EEG and its functional and introspective correlates showed that such very brief states can be clearly identified. For these studies of micro-states, brain electric activity is not viewed as waveforms but as a continuous series of momentary electric landscapes (maps) at a typical rates of 128 or 256 maps/second. .. .. .. A given landscape of the brain's momentary electric field can be assumed to represent the activity of a particular neuronal population and accordingly, a particular step or mode of information processing. A change of the momentary electric landscape must mean that a different neural population has become active and, hence, that a different step or mode of information processing is taking place. This leads to the possibility to identify momentary functional micro-states of brain activity on the basis of the spatial pattern of momentary landscape of the brain's electric potential."

I may propose: Consciousness, or 'Consciousizing' is a process in which, in the first stage, the sensory perceptions arising from the brain's interaction with an environment leads to visualization of a probable reality of either pro-survival/pleasure or anti-survival/pain, (or as a third possibility, neither of the two), which in the second stage, instantly triggers a reflex action to actualize the environment of pro-survival /pleasure as a Reality, or to de-actualize the environment of anti-survival/pain as if a Non-reality (and in the third case, be indifferent). Briefly put, the consciousizing is a default mechanism present in all living beings by the virtue of which they all automatically strive to develop an adaptability to survive in the ever changing environments.

I also propose the following Principle of Reflex Human Behavior specifying reflex characteristics underlying all kinds of human actions and reactions:

Principle of Reflex Human Behavior: All human acts and actions are brain's reflex reactions –without the subject being consciously aware of the same, triggered automatically by each consciousizing interaction of the brain with an environment, so as to either embrace the pleasure or to avert the pain as consciousized in the interaction, and as such there cannot be any human action which is neither of these two; and further that under the

prevailing conditions of the brain and the environment, the triggered reflex actions are inevitable and irreplaceable.

According to the above proposed principles, all human actions are reflex, execution and nature of which is 'decided' *jointly* by the existing status of the brain and that of the environment interacting with it at the instant of each interaction.

And also further that all human beings at the root levels behave identically like robots, - or more precisely, like Conscious Robots. Whether we like it or not, this fundamental characteristic underlying the above proposed principles is there by default in all of us to control, regulate and direct all our actions automatically without we ever realizing the same, to help us survive in or to adapt to the ever changing environments around us.

(*Continued on Part II*)