

# Contents

|           |   |           |
|-----------|---|-----------|
| <b>1</b>  | <b>Churning the Ocean of Science and Spirituality</b> | <b>1</b>  |
| <b>2</b>  | <b>Knowledge Based Perception of Soul</b>             | <b>3</b>  |
| <b>3</b>  | <b>Eternal Sun</b>                                    | <b>5</b>  |
| <b>4</b>  | <b>On Non-Duality</b>                                 | <b>9</b>  |
| <b>5</b>  | <b>Biology of Pure Procreation</b>                    | <b>15</b> |
| 5.1       | Wearer of Peacock Crown . . . . .                     | 15        |
| 5.2       | Awakened Kundalini . . . . .                          | 15        |
| 5.3       | Garden of Allah . . . . .                             | 16        |
| 5.4       | Loveful Eyes . . . . .                                | 17        |
| 5.5       | Experimental Verification . . . . .                   | 17        |
| <b>6</b>  | <b>Structure of Time</b>                              | <b>19</b> |
| <b>7</b>  | <b>Hypnosis of Body Consciousness</b>                 | <b>21</b> |
| <b>8</b>  | <b>Applications of Karma</b>                          | <b>23</b> |
| 8.1       | Introduction . . . . .                                | 23        |
| 8.2       | International Karma, and Demographics . . . . .       | 23        |
| 8.3       | Tainted Talent . . . . .                              | 24        |
| 8.4       | Circuit of Love . . . . .                             | 25        |
| 8.5       | Rebirths of Revenge . . . . .                         | 27        |
| 8.6       | Epilogue . . . . .                                    | 28        |
| <b>9</b>  | <b>What is Disease?</b>                               | <b>29</b> |
| <b>10</b> | <b>Epistemology in Cyclic Time</b>                    | <b>37</b> |
| 10.1      | Introduction . . . . .                                | 37        |

|   |           |
|---|-----------|
| <b>11 Chess and Modern Thought</b>                                  | <b>41</b> |
| <b>12 First Law of Motion in Cyclic Time</b>                        | <b>43</b> |
| <b>13 Second Law of Motion in Cyclic Time</b>                       | <b>45</b> |
| <b>14 Laws for World Cycle</b>                                      | <b>49</b> |
| 14.1 Introduction . . . . .   | 49        |
| 14.2 Correspondence Principle. . . . .                              | 50        |
| 14.3 Laws for Cyclic Change . . . . .                               | 50        |
| 14.4 Links between Space and Time . . . . .                         | 51        |
| 14.5 Size of Time cycle - Dirac's Large Number Hypothesis . . . . . | 52        |
| 14.6 Unforced Motions . . . . .                                     | 53        |
| 14.7 Forced Motions . . . . .                                       | 54        |
| 14.8 Eternal Particles . . . . .                                    | 55        |
| <b>15 Faster than Light</b>   | <b>57</b> |
| <b>16 Issue of Animal Souls</b>                                     | <b>59</b> |

**Dedication**

*This book is dedicated to my mother -  
Tripat Rani Modgil  
who is the ever present angel of our lives.*

## Inspiration

*Of (all) courses of scientific understanding, I am that by which the distinction between Matter and Spirit is known; I am the un-ending (doubt) of those debating on the theory of Perception.*

- Lord Krishna, Verse (23), Discourse (16), Book 11, Shrimad Bhagavata.

## **Preface**

This book is a compilation of articles written by the author over the period 1992-97. These articles emerged from thoughts aimed at giving a modern scientific footing to ancient spiritual concepts of consciousness and time. The front and back cover show photos of the rare early morning partial solar eclipse of 18th March 2007, taken by the author. The sole objective of author is to give a new dimension to knowledge of science and spirituality and lead to multi-disciplinary collaborations between scientists and philosophers.

Moninder Singh Modgil  
Indian Institute of Technology, Kanpur, India  
27th March 2007

# Chapter 1

## Churning the Ocean of Science and Spirituality

There is an interesting story in the ancient Indian scriptures, regarding the time when both the Deities and the Detayas (devils), decided to join hands and churn the ocean. The mountain Smeru was selected for the churning and Shesh Nag was coiled around it as the churning rope. Now the mountain would keep sinking in the ocean, and so God himself assumed the form of a huge tortoise, to prevent the mountain from sinking, and thus supported the churning. The Amrit (Elixir of eternal life) which emerged from the churning was entrusted to Mohini, who started distributing it, to Deities first. By the time, the turn of Detayas, came, the Elixir was over. Author would like to interpret this story, in context of present time of world transformation, known as confluence age - the meeting of Golden and Iron ages.

The question is what was that churning, and why did Deities and Detayas join hands in churning? What is the significance of Shesh Nag as the churning rope? And why did God assume the form of a tortoise and support the churning? And what does the Mount Smeru, as the churning pivot represent? What was that ocean? Finally, what was the Elixir which emerged from churning, and why did only the Deities get it and not the Detayas?

Spiritually speaking, all churning is that of knowledge. It is true that spiritually inclined people do churning over various aspects of spiritual knowledge, including implications of spiritual knowledge for other fields like science. Churning is also done by scientists in their quest for truth. A short visit to any good science library is enough to convince, that knowledge of science has assumed the form of ocean.

The next question, is what was the topic of the combined churning done by deities and detayas, that they had to join hands to churn? And how it is related to use of Shesh Nag as the churning rope? Nag is also a symbol of time, and Shesh nag represents the time remaining within the

time cycle, or the wheel of time. Today we see, that on one hand most of scientists have formulated their theories with a belief in linear nature of time, while on the other hand spiritualists feel that time is circular, and that the physical theories need modification. Scientists themselves are finding that their concepts are inadequate to express various aspects of reality in a consistent and coherent manner. Thus the churning described in scriptures, is an enchanting depiction of present process of validation of true knowledge, in which, both scientists and spiritualists are equal partners. And the significance of Shesh Nag, as the churning rope, is just that, nature of time itself, is the common subject of churning. If you mentally picture the mechanical process of churning, you find that the churning rope is elongated, then coiled, then again elongated and again coiled.... This represents the mental process of evaluating, which concept of time is true, linear or circular.

Finally, why did God assume the form of a tortoise, to support churning, without which, the mountain used to keep sinking? Tortoise is a symbol of power of withdrawal, retaining the essence. All mighty God Father Shiv Baba, Ocean of Knowledge, could have revealed, the knowledge in a fashion which would have convinced the scientists of circular nature of time. However, he chose to reveal only the essence and thus supported the churning by encouraging his children to discover the details for themselves.

The elixir which emerged from this churning represents the fruits - the flying machines, gadgets etc., which were based on the newly discovered laws of nature which emerged from the combined churning; the failproof, pollution free means of comfort of deities in golden age. Naturally they lasted half a kalpa (half a time cycle), and by the time, the turn came for the deities, to be reborn they were over.

## Chapter 2

# Knowledge Based Perception of Soul

Karl Popper, the noted contemporary German philosopher of science, has developed a theory of perception, in which all perception, is knowledge based. Till then, it was usually held by philosophers and even scientists, that one's perceptions were primary, on which one had to build one's world view, scientific theories. However, Popper showed, that the very structure of sense organs, such as eyes, and processing of the information conveyed onto brain by nerves from the senses, required a certain fundamental knowledge, inbuilt into the organism's structure. Thus, the Popper argued, one's perceptions were actually based on this inbuilt knowledge, within the brain and sense organ's structure. This knowledge, he hypothesizes came about via natural selection, in the course of evolution. His argument is strong and cogent enough to convince, noble prize winning neuro-biologist Sir John C. Eccles, who initially subscribed to the view, that sense data was primary. Turn around of Eccles's stance is depicted in "Self and its Brain", a book jointly authored by Eccles and Popper, in records of their oral conversations.

Another interesting view-point is that of linguist Noam Chomsky of Massachusetts Institute of technology. Chomsky has shown that, linguistic development is possible in a child, only if there is an in-built kernel of linguistic knowledge, within the new born infant. He speculates, that the 6000 odd dialects and languages current in the world today, are but different material realizations of this inbuilt kernel of linguistic knowledge. Hunting for a material basis for lingual capability of new born infant, Chomsky turns to genes, natural selection and evolution - just like Popper. However, genetists find his ideas inconcievable, for they find no mechanism of storage of such an information on genes. Thus the possibility exists, that the kernel of linguistic knowledge resides within the non-material soul, which is latter copied onto the brain and neurons, as the child learns to speak.

Our third view-point is the emerging trends in artificial intelligence - notably the expert systems and neural networks. In expert systems, one gathers the thumb rules evolved by an expert over a life time, to solve a class of specialized problems, and programs them onto a computer. Such an artificially intelligent expert system is than able to guide novices to solutions of problems in that field, which they would not have been able to solve otherwise. Such systems are called Knowledge based systems (KBS), as they are based on knowledge of a human expert, in that field. Neural networks are an attempt to mimic working of biological brains. They consist of a large number of interconnected, units, and are designed such that, given a particular input, the network responds with the required output. This is achieved by iteratively adjusting the strength of inter-connections, (by a programmer, or a program written by a programmer) till the desired output is achieved.

Thus, in the above mentioned three fields of perception, lingual comprehension, and artificial intelligence - there exists need for inbuilt knowledge, for the desired process to occur. Without the required knowledge, development of the required capability is not possible in the human or machine system. Knowledge thus becomes primary, and sense data secondary. With these, points, we are ready to face, the materialists, who are unwilling to face fact of existence of soul, which cannot be seen by untrained eye. Neither, do they accept existence of a soul world, where the souls reside before taking their first material birth on earth, within the time cycle. And the same argument is put forth for existence of subtle body as well as the subtle worlds. Our reply to the materialists, is that perception is knowledge based. Perception of soul, soul world, subtle body, subtle world, time cycle, the three worlds, or even utopia (golden age of perfection), is knowledge based. This is the concept put forth in scriptures, as the third eye of knowledge, without which even perception, lingual comprehension or intelligent functioning will not be possible. The third eye is not an eye with cornea, iris, lens and retina, and acquired in a physical operation, but is the eye of true spiritual knowledge. Then, with this knowledge, perception changes - and one is able to see the non-material soul - the spark of divine light, residing at centre of forehead of living humans, and acting, comprehending, feeling through the physical body. One is also able to see the soul world and God father Shiv Baba in soul world. This is knowledge based perception of soul and supreme soul.

# Chapter 3

## Eternal Sun

In an eternally existing, civilized cosmos, eternal existence of stars such as sun is a must. However, this contradicts, currently accepted views on, "what makes the sun shine?". The traditional view is that, within the sun, nuclear fusion is occurring, in which hydrogen atoms are fusing and forming helium atoms, and liberating energy in the process. Such models, estimate the age of sun to be around 5 billion years, and likely to last another 5 billion years. Its very clear, that this model is out of place, in a universe which repeats in identical cycles, every few thousands years. If this eternally repeating cosmos is the true model of physical universe, as claimed by Brahma Kumaris World spiritual university, - then what is the mechanism which makes the sun eternal, and what is wrong, with the traditional scientific view on source of solar energy. These are the two issues with which this paper deals.

Firstly, I highlight, two paradoxes of the sun - one is called the solar neutrino problem, and the other, the coronal temperature problem. Astrophysicists, have calculated, that if source of solar energy is indeed nuclear fusion, then a type of elementary particle called neutrino should be liberated, in the process, and a particular quantity of these solar neutrinos should be detectable at earth. Such experiments were indeed mounted in sixties, and have been going on since, almost three decades. It is a profound surprise to physicists, that number of solar neutrinos being detected are hardly one third of the calculated value. This anomaly between observation and theory has yielded varying reactions - ranging from speculative ideas, on something happening to solar neutrinos, on their way to earth, on one hand, while on the other hand the possibility considered has been, that perhaps, the solar models, governing equations, values of certain empirical constants, require modification.

The coronal temperature problem is still more intriguing. You see, while temperature of surface of sun as obtained from its surface brightness, using black-body radiation formula is hardly 6000 degrees centigrade, the temperature of its thin tenuous atmosphere - the so called "so-

lar corona" is one and a half million degrees centigrade! Solar corona extends into free space, upto a distance of more than three times, the radius of sun, and is seen during full solar eclipses, as a beautiful, fibrous halo surrounding sun. This value of temperature is obtained by noticing the presence of unique light (spectral lines) of iron atoms (ions to be more precise), in which upto thirteen electrons have been removed from the atoms. If the source of solar energy is inside the sun, and energy is flowing outwards from within, the natural expectation would be that outside should be cooler. The coronal temperature problem has another part-2 to its story. There exists a factor 2 discrepancy between temperature of ions (atoms with some electrons removed), and temperature of free electrons within corona. While there is no doubt about value of ion temperature of one and half million centigrade, there exists, certain scope in improvement of calculation of temperature of free electrons within solar corona. You see there are various types of equations which can be used for calculating the temperature of electrons within corona. If the energy is flowing from within the sun, outwards, one has to use one type of equation. On the other hand, if energy is not flowing from inside, but is in a sort of equilibrium, then one uses a different equation. The problem is that the first method, in which energy is flowing from within the sun, outwards, one obtains a value for electron temperature which is half of what is required. On the other hand, if the equation used is, one in which, such a energy flow is not there, then the value of electron temperature obtained as such, is exactly the required value. Only hindrance to using this equation is that, it does not mesh in with the conventional solar model, of energy source being within sun.

Now that the two main solar problems, namely the solar neutrino problem, and solar coronal problem are understood by the reader, I would like to propose, an "eternal sun" model. It is well known to physicists that space-time curvature can make trajectory of particles, deviate from a straight line. There exist models of universe, in which the universe is closed in such a manner, that one returns to one's original starting point, by continuing to move in a straight line, without turning back. One can conceive of an eternally repeating cosmos, in which space-time curvature is such that, if time period of repetition is  $N$  years, then light returns to its starting point after traveling  $N$  light years. The reader might be aware that a light year is distance traveled by light in one year. In such a space-time, all the radiation being emitted from sun will return back to sun, and the sun will thus be continuously replenished, by returning fluxes. The returning radiation will be confined to outer part of sun, namely the corona. Bulk of energy will thus be within corona, which will blanket the sun's surface from returning radiation. This may be the reason for, temperature of corona being 200 times higher than that of solar surface. In this model, the second equation for determining electron temperature, which yields the right value for electron temperature (!), will be applicable! Further, now

one need not postulate hydrogen fusion, as source of sun's energy, and thus one does not require, detection of previously calculated high number of solar neutrinos!

This "eternal sun" model, in which solar energy returns to its starting point, due to space-time curvature, resolves the two solar problems, while at the same time is compatible with Godly Knowledge, being expounded by Brahma Kumaris World Spiritual University. The guiding philosophy behind development of such models is to look for fundamental paradoxes prevalent in various areas of physics and other sciences, and churn on their possible resolution using principles of Godly Knowledge, and its implications. This churning will have to be a combined effort between scientists and spiritualists, analogous to mythological tale of deities and Demons, joining hands to churn the ocean (of knowledge), using a giant snake (Shesh Naag - symbol of time) as churning rope, with Mount Meeru (Abu) as the churning axis, supported by, God's incarnation as a giant tortoise (symbol of withdrawal into essence).



# Chapter 4

## On Non-Duality

Non-duality means absence of distinction between pairs of opposites, such as hot-cold, cause-effect, fast-slow, darkness-light, day-night, pain-pleasure. Adi Shankar's concept of non-duality essentially rests on his premises of omnipresence of God, while concept of duality is conventionally associated with a non-omnipresent God. This paper examines this issue from modern scientific view-point, and uses the concept of cyclic time. Essentially, I will show that, cyclic time makes cause and effect equivalent, and as a result, they cannot be regarded as opposite pairs.

First I will introduce the concept of equivalence relationship, taught in high school mathematics classes, - specifically the chapters on set theory. Cantor, considered father of set theory, defined set as - collection into a whole of objects of our intuition or thoughts. One can define various types of relations between members of a set. Mathematicians formalize these relations into three categories - (1) reflexive, (2) symmetric, and (3) transitive, which I explain below. Consider the types of relations humans can have with each other. For example, if 'A' is brother of 'B', and 'B' is brother of 'C', then it follows that 'A' is brother of 'C'. Thus, the relation of being brother is transitive, i.e., the relation transfers from first pair (A,B) to second pair (B,C). If, if 'A' and 'B', are brothers, then both the following statements hold true - (1) 'A' is brother of 'B', (2) 'B' is brother of 'A'. This relation is an example of a symmetric relation. However if 'A' and 'B' are brother, and sister respectively, then though 'A' is brother of 'B', but 'B' is not brother of 'A'. Thus relationship of being brother is not symmetric, if 'A' and 'B' are brother and sister. Concept of reflexive relation can be exemplified, by considering the relation between an employer and employee. The relation is not symmetric, since, if 'A' is employer of 'B', then 'B' is not an employer of 'A'. However, the relation can be transitive, in the sense that, if 'A', is employer of 'B', and 'B' is employer of 'A', then in a sense, 'A' is also employer of 'C', though indirectly through 'B'. Now, in the special case of self-employment, i.e., when 'A' is self employed, one can state, that 'A' is employer of 'A' - rather trivial way of stating the obvi-

ous, but that's how mathematics works- unflagging attention, to precision and detail, which pays when things get complicated. Thus, in the, last case of 'A' being self employed, the relation can be considered reflexive.

These examples clarify, that a relation between two entities, can have either, one of these properties - reflexive or symmetric or transitive; or two of these properties - reflexive and symmetric, or symmetric and transitive, or transitive and reflexive. In the special case, when a relation is having all three properties of being reflexive, transitive, and symmetric, the relation is given a special status and called an equivalence relationship. In such an equivalence, relation, all three properties - reflexivity, symmetry, and transitivity hold, and the objects connected by such a relationship, can be considered equivalent. The concept of equivalence relation, thus provides, a clue to understanding concept of non-duality, or non-distinction between opposite pairs.

Now consider the utopian case, when all humans are well wishers of each other, and consequently of themselves. Now, here, if 'A' is well wisher of 'B', then 'B' is also well wisher of 'A'. Therefore the relation of being a well wisher is symmetric, in this special circumstance. If 'A', is well wisher of 'B', and 'B' is well wisher of 'C', then 'A' is also well wisher of 'C'. Hence the relation is also transitive. Finally, 'A' is also well wisher of 'A', in the sense that one is one's own well wisher - something along the lines, that if you are good to others, you are being good to yourself. Thus the relation of being a well wisher, is an equivalence relation. In such a Golden Age, all humans are equivalent in the sense, of having similar positive qualities, attitudes, actions, etc..

Next consider the Hellish scenario, where everybody hates everybody. Evidently, if 'A' hates 'B', 'B' also hates 'A', hence the symmetry. Next, if 'A' hates 'B', and 'B' hates 'C', 'A' hates 'C' (kind of strange, since, normally one considers enemies of ones enemies, as ones friends) - hence transitivity. Finally, 'A' hates 'A' - i.e., one hates one's self, hence the hate relation is reflexive. Since, the hate relation is also having the three properties of reflexivity, symmetry, and transitivity, it follows that the relation is an equivalence relation. In such a hellish scenario, all humans are equivalent in the sense of being universally filled with negative qualities. Both the love relation outlined in the previous paragraph, and the hate relation outlined in the present paragraph, are equivalence relation. They reflect the clich, that as the individual, so the society, and as the society, so the individual - the two are inseparably interlinked, having common destiny, and modes of transformations. Thus in a sense the individual and society, also, though regarded conventionally as dual or complementary, are actually non-dual.

Next consider the nature of cause and effect, specifically in context of geometry of time - cyclic and linear. One normally assumes that cause and effect relation satisfies transivity, i.e., if 'A' causes 'B', and 'B' causes 'C', one concludes that 'A' also causes 'C'. This property of being transitive,

can be assumed to hold in both cyclic and linear geometries of time. In cyclic time, all the events can be represented as lying on a circle, while in linear time, all the events can be represented as lying on a straight line, which may be finite or infinite. By contrast, cyclic time is always of finite duration. Certain physicists regard infinite linear time, as cyclic time of infinite duration! However, causal structure of cyclic and linear time is remarkably different. For example, in linear time one cannot assert, that - (1) 'A' causes 'A' , - reflexivity, or (2) If 'A' causes 'B', then 'B' causes 'A' , - symmetry. Thus, the causal relation in linear time, is not an equivalence relation, as it has only the transitivity property, and lacks the property of being symmetric, and reflexive. Finite linear time, also suffers from two other causal pathologies, in the sense, that the first event is causeless, and the last event is effectless. Certain theologians, evoke God at these two temporal singularities, the birth (first event) and death (last event) of universe. These two causal singularities of finite linear time, can be avoided by closing the time and hence making it cyclic, by the additional assertion that the last event causes the first. This approach has a certain appeal in the sense, that it does not evoke God as a non-causal agent. This last assertion makes cyclic time an equivalence relation, by imparting it the properties of reflexivity and symmetry, whose proof is as follows.

For simplicity, let the set of all time events be represented by, 'A', 'B', 'C', ..., 'X', 'Y', 'Z'. In both cyclic and linear times, one has the statements - 'A' causes 'B'; 'B' causes 'C'; 'C' causes 'D', ..., 'X' causes 'Y', 'Y' causes 'Z'. In finite linear time there is no cause for 'A', and no effect for 'Z'. Thus 'A' and 'Z' are causally singular in finite linear time. However, in cyclic time, one has the additional statement that 'Z' causes 'A'. Thus the causal singularity of 'A' and 'Z' , present in finite linear time is removed in cyclic time. Since the property of transitivity holds, one has statements like,

(1) Since, 'A' causes 'B', and 'B' causes 'C', therefore it follows that 'A' causes 'C'. (2) Since 'A' causes 'C' (shown above), and 'C' causes 'D', it follows that 'A' causes 'D'. (3) Since 'A' causes 'D' (shown above), and 'D' causes 'E', it follows that 'A' causes 'E'.

Using the idea outlined above one can proceed to show that 'A' is also causing all other events, such as -

'A' causes 'X', 'A' causes 'Y' 'A' causes 'Z'.

The chain stops here in finite linear time. However, in cyclic time, because one has the additional assertion, 'Z' causes 'A', therefore one has -

(1) 'A' causes 'Z', and 'Z' causes 'A'. Hence symmetry holds for causal relation in cyclic time. (2) Because 'A' causes 'Z', and 'Z' causes 'A', it follows that 'A' causes 'A', i.e., 'A' is causing itself! Thus the causal relation is also reflexive in cyclic time.

Hence cause and effect become an equivalence relation in cyclic time. Hence all time events are causally equivalent. None can be distinguished

as good or bad. All events are causally related to each other! No event can be judged independently of all other events, or made to stand alone! In contrast in finite linear time, one can trace all events to the first event, where the chain of reasoning comes to a stand still.

The fact in cyclic time that cause and effect are equivalent, i.e., causality is an equivalence relation, allows resolution of certain other paradoxes such as that concerning effort and destiny. In cyclic time, all events are predestined, in the sense that they have already occurred innumerable times in past, and will also occur innumerable times in future. Thus, one is lead to doubt the validity of any effort one may be considering, to improve one's situation etc.. However, as effort and reward are causally related, and cause and effect are equivalent, it follows that effort and reward are a non-dual, indistinguishable, pair in cyclic time. Similar chain of reasoning can be worked out for whether what happens is good or bad.

In above considerations one has only considered nature of time. However, in physics, and general relativity, for one space-time event to causally influence, another space-time point, a causal light signal has to propagate from the first point to the second point. Thus one not only has to consider the geometry of time, for determining structure of causality, but also, the structure of space. It can be shown that there exists a class of space-times in which light rays return to their starting point in a single time cycle, after encircling the closed universe. These ideas have previously been explained by me in the articles 'Eternal Sun', and 'First law of motion in cyclic time'. The conclusion that causality is an equivalence relation in cyclic time, can be shown to hold true even in these space times. For example, since light ray from any point is returning to its origin, after a single time cycle, it follows that each point can causally influence itself, - by using the signal generated in previous time cycle! Thus the causal structure is reflexive. Similarly if, one point lies in future of another point, the point in future can influence the past by a light signal which circles the universe, and arrives at the past in next time cycle! Thus the causal structure is also symmetric. And transitivity always hold, in the sense that if one can send one light signal to second point, and another light signal from second point to a third point, then it follows that one can use light signals to causally influence third point from the first point. Thus causality is an equivalence relation in these special class of general relativistic space-times. This fact allows resolution of what is called as EPR paradox, originally formulated by Einstein, Podolsky, and Rosen in 1937, to show incompleteness of quantum mechanics. They showed that, certain events showed that apparent faster than light communication was occurring in particle pairs during quantum measurements, in the sense, that one particle appeared to be knowing, almost instantaneously, what was happening to the other particle. However, in cyclic time, the same set of events would have occurred in last time cycle. The signal from quantum measurement

performed in last time cycle, would circle the universe, and would influence or inform the second particle of outcome of past cycle's measurement, in the present time cycle. Thus faster than light communication need not be invoked, to explain, how the particle pairs were exchanging information apparently instantaneously. The signal that the particles pick up is actually, from last time cycle!

Time, and causality are among the more important concepts in physics, and conventionally have been regarded as linear, along with other parameters of physical interest such as temperature, velocity, energy, etc.. Is it possible, that the linear geometry, which one attributes to parameters of physical interest is wrong, and the actual geometry of physical parameters is a circle? If we are attributing cyclic geometry to time, as a fundamental postulate, why not also attribute a cyclic geometry to temperature, velocity etc. Already, it has been verified that velocity of physical particles (relative velocity to be precise) , is bounded from below (zero speed) and above (speed of light), which is compatible with velocity vector being described by a circle, rather than a straight line. In such a scenario, distinction between slow and fast vanishes, making them an equivalent, non-dual pair - since what is considered fast, is slow in another frame of reference, as follows from special theory of relativity! Situation regarding tachyons (faster than light particles) may be more complex. Similarly, temperature scale also has a lower limit of -273 degree centigrade, the so called absolute zero of thermodynamics. Matter exhibits certain very peculiar properties near this temperature, such as superconductivity (flow of current without any resistance), and superfluidity (flow of fluids, without viscosity). Recent experiments have shown that this absolute zero of temperature scale is equivalent to very high, or infinite temperatures, thus hinting at a circular geometry for temperature. In such a situation, distinction between hot and cold, also vanishes - some more non-duality for you!



# Chapter 5

## Biology of Pure Procreation

### 5.1 Wearer of Peacock Crown

There is an interesting anecdote regarding peacock, India's national bird, in villages of north India, concerning its manner of procreation. During mating season, the male peacock spreads its glorious tale and dances, with his eyes glistening with tears and drops occasionally rolling off his eyes. The peacock hen waits nearby, carefully searching ground for fallen tear drops which she ingests. Sometimes she is able to catch the tear drops in mid air as they fall off the male's eyes. Apparently, the tear drops contain the vital male procreation element and result in her pregnancy, completely unlike other birds and animals.

This same peacock's beautiful tail feather is shown adorning crown of Shri Krishna, the first prince of golden age and the first human deity to have pure birth.

In this paper, we shall examine the biological possibility of pure procreation, alternative routes to conception, with the aim that experimental verification of these ideas, will reawaken the sleeping spiritual giant in Bharatwasis, and inspire them to adopt purity as a lifestyle.

### 5.2 Awakened Kundalini

The concept of upward movement of energy from base of spine, with associated improvement in physical, mental and spiritual prowess has been a topic of fascination in tantra and spirituality through ages in India. The sperms do move from testicles to the thin walled Ampulla, which is their storehouse near Prostate gland. Then they are stored in seminal vesicles and eventually lost from the body. Perhaps, if sperms are allowed to accumulate in Ampulla in sufficiently large numbers, because of consequent higher pressures, they may be able to diffuse through the thin walls of Ampulla and enter blood stream. Could it be that secretion of Prostate

gland and seminal vesicles also play a role in diffusion of sperms through walls of Ampulla into blood stream. Perhaps resulting presence of secretions of these two glands, and sperms, in blood will make the pituitary and hypothalamus (the seat of soul) react in a way leading to inhibition of emergence of certain secondary sexual characteristics such as facial hair under action of excess testosterone and androgen. Male human dieties are shown lacking facial hair. The sperms after all are almost like a single celled organism, with a well developed locomotive facility in the form of a long and strong tail. Who knows what role they may play, once they are within blood stream, where they will have a constant supply of glucose, oxygen and other nutrients. In the rich environment of blood stream, they may undergo certain other benevolent changes and emerge stronger and more efficacious. With their locomotive facility, they will probably be able to make their way into all tissues and organs of human body, and may be, aid the immune system, help in body maintenance and repair, and arrest ageing. Perhaps the sperms are the elusive AIDS vaccine. The sperms could also make their way into - eyes and tear glands, like the case of peacock; lungs and mucus memberance lining the interior of mouth and nose, and emerge out through breath; and brain where they may be helping in neural repair. Incidentally, both neurons and sperms are extremely specialized, protein rich and incapable of further self reproduction.

### 5.3 Garden of Allah

Once the sperms lodge into lung moisture or tears or mucus memberane, they may be capable of launching themselves into air through the whip action of their strong tails. Once in the air, the single isolated sperms are just like any other bacteria or virus floating in the atmosphere, with the difference that they are having a locomotive unit. The forces acting on them in air will be - gravitational pulling them downwards; buoyancy pushing them upwards; impact of air molecules resulting in Brownian motion; diffusion; general air currents; their own locomotive effort; aerodynamic drag opposing their motion resulting in limiting their velocity in any direction to terminal velocity. Definitely, their velocity in an extremely low viscosity fluid such as air will be much higher than that in viscous fluid like the seminal fluid. The end result of all these will be that sperms will rapidly diffuse and spread into atmosphere. The process is reminiscent of diffusion of pollen grains in air, resulting in pollination of plants. No wonder the pure deities are described as flowers of garden of Allah.

## 5.4 Loveful Eyes

Moistening of loveful eyes, deep sighs are a well understood occurrence. These same sperms floating in atmosphere will enter the body of nearby human through inhalation of air by lungs or maybe by diffusing into the tears of a moist eyes, and perhaps play the part they played in their parent's costume or body. One notes the importance of constant companionship of the consort in this process. Perhaps the host's immune system will welcome, rather than reject, them. And if the conditions are right (ovulation, for example may be occurring only twice or thrice in feminine diety's body costume - when the desire for varis or inheritor is there), lead on to conception of a divine human baby's costume.

## 5.5 Experimental Verification

All the ideas expressed here are easily amenable to experimental verification. Sperms, are already a subject of scientific investigation - below, we describe possible studies on sperms which could verify these ideas.

1. What happens to sperms once they enter the blood stream. This can be studied by injecting a subject's own sperms in his own blood stream and observing their subsequent behavior. What are the tissues and organs to which they home on. Do they have any particular preference. How long will they survive in blood stream, where they will have constant access to glucose, oxygen and other nutrients. Do they undergo any structural and functional modifications in blood stream. How do they interact with other body tissues and organs such as muscles, bones, bone marrow, neurons, arteries, fat deposits etc. What effect they have on agening. Do they aid immune system. Are they the AIDS vaccine.
2. This concerns locomotive prowess of sperms. How do they move and with what speeds in fluids such as water, blood, tears, cerebrospinal fluids, air etc. Can they jump phase boundaries such as water to air and air to water, alternatively, from blood to air and from air to blood in lungs or from tears to air and from air to tears in eyes. Can they propel themselves across barriers such as thin walls of Ampulla stretched under pressure. This can be checked for an organism by surgically preventing sperms from moving from Ampulla to prostate. How much should the Ampulla be stertched, so that sperms could diffuse across it. How will sperms move about in lung tissue. How will the Pituitary and hypothalamus react to presence of sperms, and secretions of Prostate gland and seminal vesicles in blood stream and what effect this presence have on human body

in general, and emergence of secondary sexual characteristics in particular.

3. How do sperms behave in body of another person. Are they immediately attacked by immune system, or is sperm, like the AIDS virus immune to host's immune system. Will sperm's locomotive unit help it evade host's immune system if attacked. Can presence of sperms in female blood induce conception.

Naturally, scientists would like to conduct these studies on animals before trying them out on humans. Certain other studies such as locomotive prowess can be done immediately on human sperms in artificial environments.

# Chapter 6

## Structure of Time

First I introduce mathematical notion of group. We start with an example - the so called group of motions. One can move from point A to point B, and then move from point B to Point C. These two motions - first from A to B, and second from B to C, are equivalent to the motion from A to C. Thus product of two motions is also a motion. Next, any motion, also has an inverse, e.g., inverse of motion from A to B, is the motion from B to A. Finally, one has the concept of identity, or null motion, which is equivalent to not moving, i.e., staying at A itself. Any collection of objects, entities, satisfying these three properties of product, inverse and identity, form a mathematical group. For example set of all numbers also forms a group as follows -

Product of any two numbers is also a number. Any number has an inverse, such that product of a number and its inverse is one. Finally, the number 'one' is the identity, since multiplying any number by one, leaves it unchanged.

It turns out that notion of group plays an important part in mathematical physics. There is a beautiful theorem called Noether's theorem, which states that corresponding to any group structure in physics there exists a conservation law. For example, corresponding to the group of motions described above, the conservation law is that of linear momentum. Similarly, group of rotations in space also forms a group. For example, product of any two rotations is also a rotation. Corresponding to any rotation, there exists its inverse rotation. Finally, the identity element is null or zero rotation. The conservation law corresponding to group of rotations is that of angular momentum. Law of conservation of energy, which is among the most important physical laws, is related to group structure of time, from Noether's theorem. Time can have group structure as follows -

Time translation from moment A to B, followed by time translation

from moment B to C, is equal to movement of time from B to C. Hence time satisfies the product requirement of being a group. Corresponding to time movement from A to B, there should exist an inverse movement from B to A (time flowing backwards). Finally, there should exist the null movement, which would correspond to same movement being repeated again and again (time standing still).

One assumes that time has group structure, because group structure of time is related to energy conservation, which is a verified fact. But given our subjective experience of flow of time, from past to future, how is the group structure of time getting created? Time does not stand still, therefore how does null element come about, alternatively, how can the same moment be repeatedly generated? Similarly, time does not flow backwards, so how does inverse movement from B to A (indicated above) get generated? Clearly, if time is linear (straight line), and its flow unidirectional, this cannot happen. Physicists try to wriggle out of this conundrum, by making their equation, time symmetric, i.e., they allow bi-directional flow of time - a sort of two way traffic. This is clearly incorrect, because time flow is one way traffic. However, in cyclic time, group structure of time is preserved, even with unidirectional flow of time. This is easily seen as follows.

Time being cyclic, means each event has infinite number of copies in past and future. Each event has occurred infinite number of times in past and will recur infinite number of times in future. Thus null element or identity does exist for cyclic time, because there exist movements which repeat the same event, - after integral multiples of time cycle. Also for any movement from event A to B, there exists the inverse movement from event B to A, via transiting over the complete remaining cycle. Thus time has group structure if it is cyclic, even though its flow is unidirectional. Clearly, linear time does not have group structure, with unidirectional flow of time. This is a very important observation, for it establishes cyclic nature of time, on the principle of energy conservation, and irreversibility of arrow of time.

## Chapter 7

# Hypnosis of Body Consciousness

### -Consciousness

Hypnosis is a state of consciousness induced by suggestion, in which the subject exhibits altered behavior, perception and thinking. Method of coming out of hypnosis is somewhat similar to that of going into it - namely through suggestion. Under influence of hypnosis its possible to develop such high tolerance to pain that even medical operations, child birth can be carried out painlessly, without anesthesia. Such is the potential of personality transformation by hypnosis, that in stage shows by professional hypnotic entertainers, mature sedate middle aged men end up strutting and pouting on stage like rock stars. Even one's perception can be so altered, that instead of humans one sees sheep. One's response to external stimulus can be so altered so as to appear totally unconventional or extra-ordinary. Positive side of hypnosis is that one can use it to successfully overcome negative personality traits such as shyness, phobias etc.. Bed-rock of hypnosis is inviolable faith by the subject, in the suggestion offered to him by the hypnotist. It is well known that children are specially susceptible make good hypnotic subjects.

Hypnosis has been used by Freudian psycho-analysts to regress a patient to his or her early childhood, and re-live the experiences which made a deep emotional impact on him or her. The therapists then tries via suggestion to alter patient's response to those long past, traumatic experience, which are now a source of misery in patient's adult life. Some professional hypnotists claim to have the ability to take the subject back to relive his or her experience in womb and beyond - the previous births! However, not all statements made by subjects regarding their evoked memories of past births appear to make sense, and it is regarded by some that the subject is uncon-

sciously trying to please the hypnotist, and is actually inventing the memory of past life. The subject is interesting and debatable.

Title of this paper brings out the idea that one's concept of oneself, as imprinted onto one's mind during one's childhood, by repeated suggestion by parents, elders, relatives, siblings, friends, etc., - as a body with hands, legs, eyes, face etc., is nothing but a form of hypnosis carried out unwittingly by the above mentioned parties, and accepted, unquestionably by the trusting child. Neither are the parents and others to be blamed for that, because in their childhood, they themselves were subjected to the same treatment, and are themselves under "hypnosis of body-consciousness". It follows, that this is a socio-historical phenomena, which has made inroads into human society, over a period of few thousands years, as each one's original awareness of one's true form, identity and qualities diminished, and one had to rely on external sources of information for developing identity.

How 's one to come out of "hypnosis of body-consciousness", and establish oneself in one's true identity, as a soul, as a non-material, imperishable, point of divine light. The process of coming out of hypnosis, as mentioned earlier, is same as that of falling into it - by repeated suggestion and reinforcement - that I am a soul, a point of light, a powerful pure being, with all positive qualities, the conqueror of senses and sensual pleasure. This is also the method of conquering the vices, which are created by body-consciousness. This is the best method for having true lasting happiness, bliss and peace.

# Chapter 8

## Applications of Karma

### 8.1 Introduction

Herein is story of how karma operates in life. It may be regarded as speculative application of karmic theory, in variety relationships, because the examples quoted are either hearsay or a creation of imagination, rather than direct experience. Nevertheless, the logical justice of karma is brought out.

### 8.2 International Karma, and Demographics

Current demographic trends indicate small, stable or slowly growing populations for advanced countries, and large, rapidly growing populations of third world countries. Accordingly, one has a relatively comfortable life in advanced countries, and a difficult life in third world countries. One asks in which type of countries, would the souls take rebirth, given the fact that the new souls do not have any negative karmic accounts, and are destined to have a good beginning, in the first birth of their circle of rebirths? These new souls will have fresh keen intellects, strong healthy bodies, and an inclination to enter into family relations (karmic bondage) with like fresh souls. Its likely that the new souls take birth in developed countries, and as the soul gets degraded, it subsequently migrates into less affluent countries, in subsequent (human) re-incarnations. Coming into world drama play, at the fag end of world cycle, the new souls would rapidly pass through the various stages from that of complete purity, health, wealth and happiness, into a state of impurity, ill health, unhappiness, impure (ill-legal) or little wealth. This is rebirth and karma in international demographic trends with a spiritual base.

The fact that a big chunk of Indian population lives below poverty line, is a statement of spiritual bankruptcy of Indian souls! India being an ancient country, its citizens of many births, have a vast and complicated history of slow built up of negative karma, which shows up as a poor life style, and which now has to be rapidly settled in a very short time. Frequent child deaths, deaths in late pregnancy, are examples of rapid settlement of negative karma. On the whole this speaks of a rather bleak immediate national future, unless there is mass spiritual awakening of the Indian Souls, and they make efforts to settle their negative karmic debts through rajyog meditation.

Another possible speculative example of International Karma is the second world war, and the Hitler episode. Europeans in past three centuries, had wreaked havoc on ancient societies of Africa, Asia, North and South Americas, in their attempts of colonization, world domination, driven by insatiable greed. . It is likely that the souls which had suffered in hands of Europeans, died with revenge in their minds, and collectively moulded the mind set (collective consciousness) of the German nation, in a future collective reincarnation, when they matured before the time of second world war.. Interestingly, Germany was one nation which did not participate in European colonization program, and thus the German nation became instrumental in rapid settling of huge negative karma of certain European nations. It is possible that Hitler's soul was actually that of the Indian Brahmin, who instigated the first Indian revolt of 1857, against Britishers, by soldiers of Indian army, when it was discovered that rifle cartridges being supplied by Britishers were coated with animal fats, which was sacrilegious to the prevailing Indian (Hindu and muslims) religious sentiment! Even now, there is a ban by Indian government on use of animal fat as emulsifier in chocolate, which is not that case with western chocolates!

### 8.3 Tainted Talent

One usually acknowledges, that talent, intelligence, beauty, strength, etc., are God given gifts, to be used for welfare of all. However, there exists complete scope for their misuse, under the influence of evils of lust, anger, greed, attachment, ego, jealousy, hatred, etc..The karmic law is that any talent, increases through proper use and vanishes through disuse. For example criminal use of intelligence (the case of perfect criminal, or the perfect murderer), can lead to karmic providence with-holding gift of intelligence to the concerned soul in future rebirths. Same is the case with physical strength. There is an interesting real life case of a person who was born without right arm.

He always used to wonder, why the providence had given him this handicap since birth. When he started practicing rajyog meditation, he was touched one day, that in his past life he was a butcher, and had been beheading animals whole his life, with his right hand, and was therefore reborn without a right hand!

A beautiful girl or woman, who misuses her beauty for personal gain, is likely to lose it in future births. Even during her present birth, decline of her beauty would be rapid, though she may try to arrest the decline through make up or even plastic surgery, which is the fashion among the old rich today.

## 8.4 Circuit of Love

Mixed doubles are among the better sights on tennis circuit. A recent Wimbledon mixed doubles champion pair was interviewed, and they were asked, about their love lives. They replied "why spoil a good thing?". Though they hug and kiss after winning a match, but they know the line which should not be crossed. Though they both have their independent boy-friends and girl-friends, they refrain from indulging in sex with each other. Sex would spoil the friendship and rapport they have with each other, and their sporting performance would suffer. Its a tacit admission, that sex is negative karma. Sex short-circuits true love.

Next consider the case of a beautiful, ambitious, young girl, who wants to come up in life quickly, enjoy the good thing of life, so to say. She is likely to be drawn to a rich, powerful old man, because she clearly senses, that he has the money to supply her with her wants. In the process, she is likely to reject love of even talented, upcoming, young men, because she cannot wait for the young man to earn and become rich, while the best years of her life fly by. After, her marriage to the rich old man, when her material demands are satisfied, her heart would continue to yearn for tender love of her youth, and she would be tempted to get rid of the old man. The mind shivers to think about the things people do for a bit of gold, diamond, and bank balance. Here is an example of negative nexus, when lust and greed enter into a perilous partnership. Emergence of prostitution, as a social phenomena, is explainable on the basis of this negative nexus of lust and greed. It has side effect of jealousy and anger in the heart of young man, who with a glass of drink in his hand, plans murder. How many murders, suicides, have occurred because someone gave his or her heart to another? Apparently, being influenced by another persons' look, character, etc., is a negative karma, and will surely

lead to suffering.

It would appear that heart is even more precious than life! One has life insurance companies, and even medical insurance for heart surgery, but there is no emotional insurance against a broken heart! History of human heart since past two and half thousand years is littered with these sad examples of treachery by loved ones. Thousands of songs, stories, movies, etc., have been based on this theme. If a persons beloved wife runs away with another man, the husband is heartbroken. He is likely to turn into a misogynist. In his future rebirth, he is likely to abhor the very idea of marriage, and would have a tendency towards sanyas (ascetic life). This is probably the main reason, why many saints have said that female is the doorway to hell. They are actually giving vent to their hurt feelings, by making a rather unbecoming generalization. The same would apply to the case of a devoted wife, whose husband leaves her for another woman. She would be very angry, and likely to seek refuge as a nun, rather than risking a marriage, in her next life. Thus rebirth and karma, tends to explain certain behavior patterns, discernible since childhood. Such tormented souls give rise to moving pieces of poetry, music, paintings, which bring silent unexplainable tears in eyes of a sensitive audience.

A major reason for discord in relationship of husband and wife, is when one senses the spouse flirting with another person. At the present fag end of world cycle, all of us have subconscious memories of faithlessness of someone we loved truly, in a past birth. Hence slightest indication of flirtation in a life partner, sets uncontrollable emotional tidal waves rolling in the heart. This is probably the main reason for escalating divorce rates the world over! In turn, the pain of a person, on treachery of a beloved is a source of settling of severe karmic account. Thus, if a soul wanted to inflict severe pain on another, it would become a beautiful lovable wife who runs away! I know the case of an Indian mathematician of international repute, who has become a mental case, because his wife ran away with another. Father of an acquaintance of mine committed suicide because he could not bear the thought that his wife had left him and was staying with her childhood sweetheart. Another friend of mine had to seek a painful divorce, when her husband insisted on spending nights with a former sweetheart. Ground for innumerable cases of divorce is faithlessness or adultery on part of partner. In this world where the slogan of souls seems to be to give sorrow and take sorrow, it would be foolhardy to take emotional risk of giving one's heart to another, with heartbreak guaranteed. The world has become "Hotel Heartbreak" so to speak. The correct response will be to treat one's partner (if one has any) as an actor in world drama play with her or

his independent part, on which one has no control, and practice detachment inwardly. Even if the partner is faithful till life's end, death is definitely going to separate the hearts, leaving the surviving one with painful bitter sweet memories, from which death would be a welcome respite. That's why some people say "to eat sweets when mother dies, and to eat sweets when the wife dies/runs away". It makes sense to make God as one's sweetheart, because his love is pure, and free from impure desires.

These are examples, of settling of karmic accounts through man-woman relationship. Karmic accounts are also settled through other relationships. Consider the example of a perennially sick child of rich parents. They spend an untold amount on medical treatment of their child, who finally dies young leaving behind a heartbroken parents. You see rebirth and karma provide beautiful, imaginative ways for settling of interpersonal accounts. What court of justice could enforce such punishments!

## 8.5 Rebirths of Revenge

One hears stories of gang rapes, in which a woman is abducted by a gang and repeatedly raped. She either dies in the process or is later killed when the lust of rapists is temporarily satiated. This is one scenario. Another scenario is that of the psychopathic serial killer, who abducts young girls, rapes them and then murders them. There was a recent English movie "Silence of the Lamb", based upon this theme. Both scenarios are mind numbing but are repeatedly flashed in newspapers. Is there a logical karmic connection between the two? Consider the mental state of the woman who dies during the gang rape. With what state of mind would her soul have left the body, and what kind of life it would subsequently lead after rebirth. Similarly, her killer rapists, would be reborn a few years after her death, and will be much younger in bodily age, in the next birth, as compared to the present bodily age of the soul who left the body during gang rape. It is likely that the woman's soul who left the body during gang rape, is reborn in a male body, and matures into a psychopathic serial killer of young girls, who are actually the reincarnations of past birth's gang rapists! My, My! Looks like, police and law are like dummies when it comes to settling of karmic accounts!

There is the interesting story of a teenage girl in Orissa, India. She was abducted, raped and killed by three boys, when she responded negatively to advances of one of the three boys, because she was in love with another. Though the body was found the very next day,

there was no clue to her killers. The soul of this girl entered the living body of her younger sister, and informed the police about her killers, and where they were hiding. The police followed the tip, and confronted the boys, where upon they confessed to their heinous crime! This is an example of soul seeking revenge through par-kaya-pervvesh (entering another's body)!

Another (ghost) story is that of a young newly married couple, who were traveling on a highway on a new motor-cycle which was gifted to the groom as part of dowry. The husband was not a very confident driver, and on a turning the motorcycle skidded and they fell. Husband survived but the young wife died on the spot. A couple of days latter, the grief stricken husband was traveling alone on the same motorcycle on the same road. On approaching the accident spot, he suddenly noticed a young bride sitting on the road and crying. He applied brakes, skidded, fell and died on the spot! (Marvelous, but who is telling the story?) Strong unfulfilled desires, sometimes make it impossible for soul to be reborn, and it wanders in the ether aimlessly, in a vain attempt to vicariously fulfill desire through a body which no longer exists.

## 8.6 Epilogue

To err is human, to forgive divine. Theory of karma suggests that there is complete scope of settlement of all accounts, without returning bad by bad. As the God says in Bible "revenge is mine". However, the karmic settlement of accounts is through the family, economic, mental and physical circumstance of future and present reincarnations. There is no need for God to subject the erring soul into a hellish fire. Right attitude to a soul, who is doing wrong to me is good will, co-operation and forgiveness. These elevated vibrations would fundamentally transform the other person, and their continuous practice requires unlimited patience and faith in God as one's protector. If I try to return wrong, with wrong, I am creating negative karma for myself - I can never take law into my hands. Author would like to apologize to reader, if he has disturbed his or her mind. But these are few ideas which he felt like sharing with others, and would welcome readers' comments .

## Chapter 9

### What is Disease?

Complexity of human organism continues to baffle, the enquiring human intellect. Much though the human mind would like to bask in the warmth of past successes, but the new emergent forms of disease like AIDS, continue to elude solution, forcing the intellect onwards to more esoteric concepts. AIDS, as is well known, is marked by a complete failure of organism's immune system, as a result of which the diseased subject falls easy prey to infections such as pneumonia, despite the medical aid - which in normal circumstances, would have been sufficient to cure it. One wonders, then, whether the science has really understood disease after all, or there are still some aspects of the 'disease', phenomenon which require explanation.

Hahnemann, an 18th century German physician, and founder of Homoeopathy, went on to comment, that the cause of disease is not clear, even though he had a remedy to postpone the immediate physical suffering. Homoeopathic system of medicine defies the widely accepted concepts of modern science, but nevertheless, efficacy of Homeopathy is well established - especially in the minds of the people, who had given up hope of relief through conventional allopathic medicines, but found a lasting cure through Homoeopathic treatment. Neither is this efficacy an effect of suggestion, as tests in curing animals through Homeopathy, have proved. But still efficacy of homoeopathic treatment is a source of continued wonder, to the mind trained in thinking of modern science. The fundamental point of conflict in Homoeopathy and modern science is that, when the medicine is diluted to the very high potencies, apparently not a single molecule of the original mineral should be left in the pills - still they work. And more the dilution, greater their effect. This point was the main reason for rejection of Homoeopathy by the scientific mind, and continues to remain - so much so that the papers on Ho-

moeopathy are rejected by traditional scientific journals such as 'Nature', on this point alone.

Popper, the noted contemporary German philosopher of science has developed a philosophy of science, in which a theory is worth its weight of paper, only as long as it is not in conflict with an observation. A single observation in contradiction with theory, is enough to sound the death knell, of that theory. Similarly, another noted contemporary American philosopher Thomas Kuhn, famous for his book 'Structure of Scientific Revolution', has commented, how new scientific ideas are a creation of new creative minds with little training in orthodox thinking prevalent at that time. These new ideas, he continues, meet stiff resistance from the conventional orthodox scientists, but are gradually accepted and assimilated by the scientific community over a period of time, as the gradual realization dawns that the new ideas are in better agreement with observation and the old set of concepts is actually in contradiction with observation. This ability to mold itself is the hall mark of scientific process and the scientific mind - but is an uncommon attribute in majority, and therefore the reason for intellectual resistance to new ideas.

When Hahnemann was developing his system of medicine, there was no well established theory of atoms or molecules - consequently no one objected that the very high dilutions that he was using would remove all traces of the original mineral. This objection to Homoeopathy is a relatively modern one. Modern atomic theory of matter has come to be well established only in past hundred years or so. So the intellectual resistance to Homoeopathy is understandable in light of Kuhn's ideas, but how should one regard efficacy of Homoeopathy, keeping in mind Popper's theory for change in scientific theories? One possible logical conclusion would be that the atomic theory of matter may not be right. Other explanations have also been suggested, such as the so called 'memory of water', without much success, however.

Let's examine the contrast between Allopathy and Homoeopathy, in their attitude to the disease, its symptoms, cause and cure. Homoeopathy regards the symptoms as different from the disease. Actual cause of disease verges on meta-physical in Homoeopathy. In contrast Allopathy considers disease, as being caused by Germs - bacteria, viruses. Though both systems acknowledge the role played by organism's immune system in onset of disease and its cure, but they differ on the proper action to restore health. Where as Homoeopathy tries to fine tune or bolster the immune system, Allopathy targets the germs. In Homoeopathy first there is disease, then there is lowering of immune response, which in turn leads to mul-

tiplication of various types of germs, which in turn cause the external symptoms. On the other hand, though Allopathy acknowledges that organism's immunity is lowered prior to disease onset, which allows germs to build up and cause symptoms, it contents itself to targeting the germs and disappearance of external symptoms. In recent years Allopathy has come to acknowledge the role played by mind in the disease process, manifest in the form of so called psychosomatic diseases, especially related to stress. However, in absence of a well defined scientific theory of mind-brain interaction, there is little anyone can do, to explore the connection and its ramifications and consequences.

With this background, lets examine the fantastic phenomenon of AIDS. AIDS is especially relevent to our theme, because it is marked by the complete failure of immune system, which is universally related to disease - explicitly as effect of disease in Homoeopathy, and implicitly in Allopathy. Modern Allopathic scientific thinking has identified the so called HIV virus as the cause of AIDS. Once, the HIV virus enters a person's blood stream, body reacts by producing certain anti-bodies. However, the virus soon lodges itself in certain white blood cells, namely the so called lymphocytes and macrophages. These cells, as is well known are vital to immune system, and are responsible for killing infectious germs. At this point virus can no longer be detected in the blood, but traces of anti-bodies which were produced continue to remain, and are used in tests for detecting whether a person is sero-positive (infected by HIV) or not. Lymphocytes and macrophages cells carry the T4 protein on their cell membrane, which is used by HIV virus in entering them. After entering the cells, the virus sheds off its outer protein coat, and the viral RNA copies into host cell's DNA, using an enzyme called reverse transcriptase. Nothing seems to happen for some time after which due to certain unknown triggers (such as cell duplication, effect of ultra-violet radiation, certain infections or growth factors) copies of HIV's RNA start getting created non-stop. This duplication rapidly leads to cell death, after which, the daughter HIV infect other cells, and the process of RNA transfer to host DNA, and latter uncontrolled duplication, is repeated. Thus a chronic shortage of these fighter cells arises, and leads to proliferation of disease causing germs and onset of AIDS. Another fact vexing research for an AIDS vaccine is that, the duplication process of HIV's RNA is not very accurate - consequently, every daughter HIV differs from its parent and sisters, in some aspects, such as protein coat etc.. So not only, an AIDS carrier (after the uncontrolled duplication of HIV starts) is having a variety of HIV viruses with different genes, which keep changing - but also the genes of HIV transmitted by an infected person to another per-

son, differ from the genes of the viruses with which the first person was effected with. This makes it difficult to make a medicine effective against all HIV viruses, because, a medicine effective against a virus with a particular genetic makeup, would not work against those with another genetic makeup. Recently, it has been found out that there exists another HIV virus sufficiently different genetically from the previous known HIV virus, so as to deserve the label HIV2. It is suspected that a whole class of such viruses lethal to humans may be there, and in fact, there are many similar types of viruses causing diseases, even in animals. There are two points to be noted here -

- (1) HIV virus appears to be affecting the very cells which would have ordinarily killed other germs.
- (2) The period during which HIV virus is inactive, can be as much as many years, during which the infected person can infect other people also.

Now these facts are extremely intriguing. Here is an entity, a white blood cell which kills germs - a HIV virus enters it and stays quite for some time - then suddenly, one fine day this virus starts multiplying and kills it - goes into blood stream, infects other cells, and the cycle is repeated. It appears likely, that something has gone wrong with the white blood cells themselves which is allowing HIV virus to proliferate within and cause cell death, because till a certain point of time, that was not happening, in any of the infected cells. Thus if one postulates an internal cellular immune system, used by the white blood cells for self-defense, then it appears likely that in case of AIDS onset, it is this internal cellular immune system's failure, which is the problem (author's argument is reminiscent of 'wheels within wheels' and Russian 'dolls within dolls'). How do we correct this? How is it that cellular immune system of distinct and widely separated infected blood cells has failed simultaneously? What is that common denominator which is allowing cellular immune system of all the white blood cells to go hay wire? Even in other forms of disease, efficacy of white blood cells must be getting lowered simultaneously all over body, which lowers the immune response and leads to symptom onset. Since, this is occurring all over body, there must be some chemical, protein or hormone released by brain in hypothalamus-pituitary complex or some other gland, which is directly effecting efficacy of lymphocytes and macrophages. Which hormone is that? I think this can be answered by a comparison of hormones present in the blood of affected and unaffected persons, and response of relevant white blood cells to those hormones. In fact, some of the drugs effective in delaying AIDS onset after infection, are actually proteins

such as alpha interferon. Incidentally, the same hormone interferon, is also used in cancer treatment, a disease whose cause, modern science is slowly coming to grips with. Evidentially, then a lot exists to be learnt in functioning of the human organism, and any complacency or narrow-mindedness on these issues, would only serve to delay the revelation of 'Truth'. One needs to formulate hypothesis, and subject them to experiment, to ferret, the 'hidden scientific truth'.

Hahnemann was of the opinion, that after all germs are also part of God's creation, and why should they be blamed for our troubles. He felt that blaming germs for the disease, was a result of confusing cause and effect - the disease is the cause and, the germs and symptoms are the effect. AIDS phenomenon seems to confirm Hahnemann's intuition, since the infecting germ continues to be present without causing disease in healthy carriers. Same is actually the case with many other diseases. Also in diseases such as cancer, and auto-immunity diseases such as diabetes (in which insulin producing cells within pancreas - the so called islets of langerhans are destroyed by white blood cells) and certain types of arthritis (in which joints are attacked by white blood cells), there are no germs at all. Same is also the case in tumors (causing strokes) and fat deposits leading to heart attacks. Similarly, in diseases such as epilepsy, alzheimer's disease, parkinson's disease, again there are no germs, as is also the case with mental disorders such as neurosis, schizophrenia and psychosis. Evidently, germ theory is only applicable to a specific class of 'disease', and a broader explanation of 'disease' is required, so as to be applicable to general disorders of the human organism. From a scientific point of view, it will be therefore better to state that - fundamental cause of disease continues to remain unknown, though one does has certain cures and remedies, at the present state of human knowledge.

It is at this point, that one feels the need for an alternative explanation of the 'disease' phenomenon. May be the origin of disease is not physical at all - just like the origin of human personality is not the physical body or brain, but the metaphysical soul, regulating and acting through the body 'machine'. One would be tempted to state that disease is a worn out state of this body 'machine' through use, misuse, over use - that it is a natural consequence, just like wear and tear of car is a natural consequence of use over a period of few years. However, one finds the young and new borns also suffering, and infections and disease can occur in pre-natal period also. The 'used car theory' of disease therefore is misleading. One common observation pertaining to all disease, is the associated suffering of the person - the sheer pain and agony. Mind's ability of associ-

ation leads one to wonder, whether the associated pain can give a clue to the origin of disease. It is through pain that the person becomes aware that something is wrong, and patient's description of pain is used by doctors for diagnosis. Now pain is something which the science fails to understand, even though it is among the causes which lead to emergence of the medical science. There is no instrument which measures pain of a heart attack, though there are instruments which measure the blood pressure, heart beat etc.. Therefore, pain appears to be the key to understanding the 'disease', because almost invariably, 'where there is disease, there is pain'. And when one experiences pain, of almost any kind, one wonders, what did I do that I have to suffer this. Though one may not have an immediate or ready answer to this question, nevertheless, there must have been some action, some deed or mis-deed, for which this pain is the punishment. The very basis of legal systems of various types practised all over the world, is this 'crime and punishment', or 'one must pay for one's mis-deeds'. Unfortunately, the legal systems are limited in their scope of action, as they are on body-consciousness, and try to settle 'accounts' within the person's life span. The author does not have to emphasize, that numerous culprits finish their lives unpunished by law. What 'payment for their sins' did such people do? And such 'negative examples' become motivation for others to keep on continuing with their 'negative tendencies'. It appears to escape one's attention, that their could be a 'natural law', unlimited in its scope, unlimited by the limitation of a single human life span, capable of acting across births, rebirths, and for which the maxim 'one cannot escape the law' truly holds - with the disease being just one means of doling out the right amount of punishment for a particular 'crime'.

From a spiritual point of view, the physical and mental suffering one undergoes during disease, is actually a consequence of our negative or impure past actions - and to some extent serve to relieve, the burden of past sins. A corroboration of this is the observation of Rajyogis, that they feel lighter and experience more powerful states of rajyog, immediately after, a period of sickness - suggesting that to some extent, the fire of disease served the purpose of purifying the soul. By these remarks author should not be misconstrued, to think that he heartily recommends suffering and disease. Author's point of contention is, that the physical disease with its symptoms and causes is secondary, whereas, the primary disease - the disease of soul is the false identification with one's physical self or body and its actions - and consequent thought, speech, actions, relationships and dreams, under impure possession by lust, anger, greed, attachment, ego, fear, sloth, jealousy, hatred, intoxicants and other vices. A doctrine ex-

plaining role of soul - the non-material self, in body's immune response in particular; and also the soul-body interaction, in general - is required to produce better doctors.



# Chapter 10

## Epistemology in Cyclic Time

### 10.1 Introduction

Evolution of events in identical cycles, has been a hall mark of ancient philosophical systems - right from American Indians, and Greeks, on one hand, to Indians, and Chinese on the other [1]. In more recent times, Poincare and Nietzsche attempted a mathematical formulation of the idea, which is now enshrined in mathematical physics as Poincare recurrence concept [2]]. In the last quarter of twentieth century, isolated attempts to resolve certain problems of theoretical physics, using a cyclic concept of time have been made [3] - notable among them is Segal's cosmological model [4], which successfully re-interprets all observational evidence, hitherto attributed to big-bang cosmology. In this model, universe is closed - having topology of 3-sphere, and time cyclic. In this space-time, light rays return to their origin, after circling the closed universe in a single time cycle. Popper [5] cedes, that changes in knowledge occur gradually, but being an evolutionist, he feels that the changes began billions of years ago, many of which are inbuilt in the structure of our sense organs and brains - and that this series of changes in knowledge will continue indefinitely. However, provided one combines, Popper's concept of gradual change in human knowledge, with Poincare's concept of result of a series of changes being a cycle, one is lead to epistemology in cyclic time.

If one considers the possibility that human civilization has always been extant in this cyclic time, with number of generations of humans being a very large integer, then one is lead to the inescapable conclusion, that human knowledge, science and technology, also change in identical cycles. One is lead to ask the question, as to what is the driving force in this cyclic changes in human knowledge. As human knowledge arises by observation and interpretation, a function of

mind and intellect, therefore, the driving force behind cyclic change in human knowledge, must be cyclic changes in perspicuity and purity of human mind and intellect.

As a striking example of evolution of knowledge in cycles (within a physical cyclic time), consider the conceptual status awarded to nature of earth, and earth's relationship with cosmos. Prior to Aristotle, as indicated in ancient Indian texts, earth was considered flat, and the universe rotating daily above this flat earth. Around about Aristotle's time the world view emerged, that various differences in Sun's latitude observed at different northern points could be attributed to a spherical earth. However, the universe continued to rotate daily around the spherical earth, in Aristotelian cosmology [6]. During the generations of Kepler, Copernicus, and Galileo, the accumulated data on movements of astronomical bodies, lead them to conclude, that earth was not the center of universe, but was a planet, and rotated once around the sun once every year, and this was the cause of seasons.

Both changes, the first one around Aristotle's time, and second one around Galileo's time, were based on the generally accepted validity of Euclidean geometry - fundamental assumption being that light travels in straight lines. However, geometry itself, underwent fundamental changes during 19th century, when it was realized, that alternatives to Euclidean geometry were possible, by modifying its axioms [7]. Notable among them was the work of Riemann, which laid foundation for Einstein's general theory of relativity [8]. One immediate result of general relativity was that light stopped traveling in straight lines, in minds of men, after confirmation of Eddington's solar eclipse experiment [9] on bending of star light near sun. Since then a number of solutions to Einstein's field equation for gravitation have been found. Einstein's original cosmological model had a 3-sphere universe, and an infinite time, and was called "Einstein's cylinder". Hopes of general relativists, that Einstein's field equations determine the universe's large scale structure uniquely were dashed to the ground by Godel's discovery of a rotating universe model [10], which though had a same local distribution of matter as Einstein's cylinder, nevertheless, differed remarkably from it in over all properties - most notable among them being that, Godel universe had closed time like curves, and it was possible for an observer to access its past in principle. Godel got around this problem of causality violation, by denying freewill to observers. Since then, a number of generalizations of Godel universe have been created, including those, in which universe is charged, and a constant electromagnetic field is present everywhere within universe [11].

Many modern physicists are of the view, that mankind is near climax of conceptual knowledge [12]. Such being the case, a believer of cyclic time, in which human observers exist eternally, is lead to ask the question, as to how, given the present state of human knowledge, will the humans revert back to the belief of universe rotating daily, above a flat stationary earth. This is an example of issues facing Epistemology in cyclic time. One possibility is that, through a series of artificial or natural calamities, mankind is reduced to a state deprived of its intellectual inheritance, and therefore, out of ignorance, such primitive world view prevails. There exists, however, an altogether, different, striking, possibility, which I find very exciting, and would like to share with you.

As mentioned earlier, rotating Godel universe is a solution to Einstein's field equations. Behavior of light rays, in Godel universe, has the remarkable property, that light rays curve back, after traveling a finite distance perpendicular to the direction of rotation [13]. Thus imagine, a flat earth in Göodel cosmology, with rotation axis perpendicular to the flat earth. A picture taken from a space-craft, above this flat earth in Göodel cosmology, will show light arriving at the camera, only from a circular patch - light from remaining parts of flat earth curving away from camera and never reaching it. This will generate illusion of sphericity, for one who assumes that space-time geometry near earth is basically Euclidean. Similarly, light from stars such as sun, will be accessible, only from a circular patch, on this flat earth, remaining parts of earth, being deprived, as the light curves away, as it approaches earth. At circumference, of this circular patch, light rays will be tangential to flat earth, thus explaining the apparent sunrise, sunset etc..

Further if such a rotating universe is charged, it will generate a magnetic field which reverses, periodically, as a result of quantum cosmological tunneling between two counter-rotating solutions of quantum gravity Wheeler-DeWitt equation [14], which describes such a universe. I have done some calculations [15] which show magnitude of this geomagnetic polarity reversal to be 157 degree, which is close to actual value measured from paleo-magnetic rock samples. My prediction of paleomagnetic intensity during transition periods also matches that observed in samples. Presentations of these detailed calculations would however, be beyond scope of this conference and paper. Details of these ideas are reproduced in appendix-1, for benefit of interested readers. is so interested, I invite reader to contact me for the same. However, time is not cyclic in Godel universe, and universe also is not closed. These two objections can be overcome by what is called as "conformal compactification", [16] in jargon of general relativists, which make the time cyclic and universe closed, with

other properties of Godel universe, such as rotation, and presence of closed time like curves, remaining intact.

Needless, to say a number of unresolved issues remain, before widespread adoption of a "quantum gravity rotating Godel universe", takes place - which will have to be tackled one at a time, as was the situation faced by Galileo [17]. Interestingly, it can be shown that notion of causality in Godel universe is actually consistent with implications of EPR paradox [18], which has been experimentally verified in recent times [19]. I am of the opinion, that if time is cyclic with eternal existence of civilized humans, then provided a catastrophe, which breaks the continuity of evolution of human knowledge, does not occur, then the quantum gravity Godel universe must be the best description of our universe. So I find epistemology in cyclic time indeed exciting, and welcome the reader to share in the churning on true nature of time (cyclic or linear) and its implications.

**Note:** *Dynamics in rotating Godel type metrics are so different from Newtonian dynamics, that if the universe is indeed having such a rotating metric, then claims of successful deep space missions, such as moon, mars landings etc., cannot be true - because if these claims are true then they are verification of Newtonian-Copernicus model.*

# Chapter 11

## Chess and Modern Thought

Garry Kasparov, reigning champion of Professional Chess Association, says he is interested in study of how human thought has evolved through history. Such an interest is indeed becoming for the world champion of 'Chess', the most cerebral of all games. For chess, which was played in ancient India, has evolved through ages, alongside the changing trends in human thinking. Modern chess rules such as power allotted to pieces, are different from those in vogue 500 and 1000 years ago. One such rule is the power allotted to the piece, which is called 'queen' in western terminology, but is called 'prime-minister' or 'minister', in the original ancient Indian terminology. Previously the 'king', had significantly more powers than the 'minister' (or prime-minister), where as now, the queen or minister is the strongest piece on board.

Terminology 'queen' for the most powerful piece, in a game which is considered as intellectual substitute to physical warfare, is reminiscent of increasingly martial and dominant role being played by women, on world stage. One is also reminded in a lighter, vein of women prime-ministers such as Indira Gandhi, Margret Thatcher, and to a certain extent present American president Clinton's wife, with respect to the image of absolute power they wield, in chess board of national and inter-national politics.

Another interesting interpretation of devaluation of King's mobility and power, and upgradation of 'prime minister's' power, in chess, is advent of era of democracy - when the King's lost their crowns and prime-ministers and presidents - elected representatives of people, became the power figures. Is it just a historical co-incident, that this change in chess rules occurred, in a period of history co-incident with budding thoughts of democracy in minds of men, about 500 years ago?

The version of chess recorded in the scripture Mahabharata, indicates the game being played by 4 persons -(two teams of 2 people - with players in same team co-operating with each other to win against the rival team). Further, the movements of pieces, or selection of the piece to be moved was governed by dice in certain versions. The level of social interaction, psychological aspects, cooperation, rivalry, risk taking, were at a higher levels in those versions. Thus not only was actual analytical skill of a person important, but his or her luck, as to outcome of the dice throw, as well as, the ability to use the uncertain outcome, in a coherent, planned manner, were also important. The ancient chess thus resembled real life, to a greater extent, than the modern version, which lacks the element of social co-operation, and inherent uncertainty. Does not this reflect, the actual change in moral values, man-kind has undergone in past 2500 years or so - in the sense of unwillingness to accept natural course of events, or being unappreciative of another persons undesirable actions? Change from 4-person chess with two against two, to the modern 2-person chess, thus reflects emergence of intolerance, and unwillingness to live with others.

Use of dice, in ancient versions, was not merely a method of evoking uncertainty. Rather, it was an opportunity of mind controlling material uncertainty. The player had to calculate, as to which outcome of dice could be translated into a good move, and then will that particular outcome. His or her partner, if having a similar thought, would then be able to mentally cooperate in willing that particular number of dice. Whereas their opponents, would try to will, a number which would force, a bad move, or not the best move. The fact is that souls, during their ancient incarnations, were purer, than they are in present modern day incarnations, and had greater controlling power over matter - elements and events.

Since events repeat in identical cycles, one can expect the ancient version of chess to reappear. It will be interesting to see, a toy or sports company undertaking marketing and advertisement of that ancient 4-player dice version of game, in these modern times. Such a version will be similar to present day card game of Poker, in its social context, to some extent - and may be called "chess-poker" or "choper", which surprisingly was the actual ancient name! If such an eventuality indeed happens, nobody will be able to deny that history indeed repeats itself.

## Chapter 12

# First Law of Motion in Cyclic Time

Every high school student knows Newton's first law of motion, which states that every body continues in a state of rest or uniform rectilinear motion, unless acted upon by an external force. This law was actually initially formulated by Galileo - Newton's original contribution lay in formulation of the second and third laws of motion. Second law states that acceleration of a body is inversely proportional to its mass and directly proportional to the applied force. While the third law states that action and reaction are equal and opposite and act on different bodies. These three laws form the basis of classical physics, based upon which other developments, of classical mechanics, celestial mechanics, statistical mechanics, have occurred. Cyclicity of events requires that all particles return to their original position at the end of time cycle, whereas Galileo-Newton first law of motion would suggest that particles would continue to move in a straight line, and therefore at the end of time cycle, would be at a large distance from their initial starting point. How do we resolve this conflict? Clearly discussion is only for particles which do not collide or interact with other particles, throughout the time cycle, and thus are in preview of first law, which considers motion without forces.

Let's consider how the first law of motion should be modified, when the universe is repeating itself in identical cycles. Clearly, if time is cyclic, all particles should resume their original position, after completion of the time cycle. In the formulation of first law of motion, given above, this is not possible in a straightforward manner, and additional constraints are required. For example, if the universe is a higher dimensional sphere (hypersphere), with circumference such that, in a single time cycle, light particles (photons) are able to travel

around the universe and return to their starting point, then at least light particles, have resumed their original position at the end of time cycle. However, particles travelling slower than light will require a longer time period to complete their circle of universe, and therefore will not be at their original position when the time cycle is completed. In a cosmological model with cyclic time, additional constraint has to be imposed on free motion of particles.

Since, incorporation of non-Euclidean geometry in physics, with advent of general theory of relativity, propounded by Einstein, concept of free motion of particles has been gradually redefined. If the space itself is curved, then straight lines do not exist. For example, on a plain, a stream of water can flow in a straight line. However, if the stream is on a mountain, it takes a curved path - the path of least resistance or obstruction. This is the concept of geodesic. The curved path taken by a stream of water on a mountain is an example of geodesic motion. Thus what we require in cyclic time, is closure of all geodesics, i.e., closure of all particle paths in a single time cycle. What this means is, no matter what path a particle takes, it should return to its starting point in a single time cycle. Thus a re-formulation of first law of motion, when no forces are acting on the particle, is as follows

Natural particle paths are circles whose radii are directly proportional to particle's velocity.

Interestingly, ancient Greeks believed, that natural particle paths were circles, rather than the Galileo-Newtonian straight lines. Their conclusion was based upon the apparent daily rotation of heavenly bodies around the stationary earth based on belief in Aristotelian cosmology. However, the Greek first law of motion, was based upon the 24 hour cycle of day and night. In contrast, our new first law of motion is based upon identical repetition of events - the so called, Brahma's day and Brahma's night.

## Chapter 13

# Second Law of Motion in Cyclic Time

First law of motion in cyclic time states that inertial motion of particles is on a velocity dependent circle. The law has a statistical character, in the sense, that if one has an ensemble of particles, their future path lies on a torus, and exact path is not specified. It should be interesting to see, if this can be linked up with probability concept of quantum mechanics. However, what happens when the particles are interacting, colliding with each other? How is recurrence being ensured in presence of collisions, and forces, which modify geodesic motion defined in first law, which would otherwise ensure recurrence? This is purview of second law - motion in presence of forces.

It is clear, that where as some particles may interact, only a few times (such as weakly interacting neutrinos), other may interact many times (such as strongly interacting hadrons). There may be exceptional particles, which may not interact at all, due to sheer chance. Therefore, what is required is a simple rule, which will ensure recurrence, of initial position, velocity and acceleration of the particle, irrespective of how much it has interacted. This is possible by defining a second law of motion as follows -

Disturbance of original pure motion of particle, induces a metric force on the particle, which is proportional to inverse powers of remanant time in the time cycle, and leads to restoration of the original configuration in a violent manner.

What the law means is that motion of a particle after a collision is not the simple circular inertial motion defined in first law, rather, it is an accelerated motion which will restore its original position, velocity, acceleration etc., at the end of time cycle. The source of this

acceleration, is attributed to the space-time metric which will define recurrence geodesic of the particle. Recurrence geodesic means, a geodesic, along which the particle's motion will lead to restoration of original configuration. Thus, the metric (defining recurrence geodesic) as experienced by a particle, will depend upon its past history, and critically on its initial configuration, at the start of time cycle.

This disturbance of original pure motion due to interactions can be regarded as the natural mechanical entropy, which increases throughout the time cycle. This mechanical entropy is reduced to original level, during the final violent movement of the particles, when the restoring metric pseudo-force becomes un-opposable by all other interactions. This final motion will be experienced as destruction, by sentient creatures. Thus in this second law, destruction, entropy increase, as well as entropy restoration, all are inbuilt. Entropy need not be introduced as an empirical idea in thermodynamics, which keeps increasing, but follows naturally from second law. Second law of thermodynamics (increasing entropy) thus is inbuilt within second law of motion.

One guiding principle in this exercise of developing physics in cyclic time, is that as the size of time cycle tends to infinity, time assumes a linear character, and hence the laws, should assume a form, they have in linear time. This idea can be regarded as the correspondence principle between cyclic time, and linear time. That this happens in first law is clear, as the size of time cycle increases, size of velocity dependent circles also increases, and when time cycle size tends to infinity, the circles tend to become straight lines. Further, all the distinct possible circles, merge into a single straight line, in the limit. The law thus loses its statistical character in linear time. This suggests that the reason for poor understanding of foundation of use of probability in quantum mechanics could be because, it has been based on linear time. Even Newtonian mechanics in cyclic time is having a statistical character. A reformulation of quantum mechanics in cyclic time should be interesting.

That this new second law of motion in cyclic time leads to conventional linear time second law, as the time period tends to infinity is also clear. As size of time cycle tends to infinity, restoring, metric pseudo-force will always be zero, hence subsequent motion of a particle after an interaction, will be the conventional inertial (straight line). Entropy will also keep on increasing, - there never will be a moment of entropy reduction. This new formulation also has a statistical character, in the sense, that there will exist a whole class of recurrence geodesics. It is likely, that proper development of this idea, would lead to cessation of distinction between Newtonian mechan-

ics and quantum meachanics. Foundations of quantum mechanics therefore need to be re-examined in cyclic time.



# Chapter 14

## Laws for World Cycle

### 14.1 Introduction

The concept of events repeating in identical cycles is strong enough to call for reformulation of known or accepted physical laws. The accepted corpus of physical laws is based on small space-time intervals, and implicitly assumes linear time. This approach even yields results which agrees quite well with experimental results. This is because for small time intervals, curvature of time may have only a small effect, and so may get hidden in error band of experimental result. It could therefore be neglected, as a first approximation. However, we are interested in behaviour of matter over a long time intervals, or rather over a time interval equaling the complete time cycle. Hence, we cannot apply linear time laws and expect to get repetition of events in identical cycles. So 'what must be laws for world cycle', is the question that this paper addresses. Formulation of such laws is a first step towards a new physical theory, whose experimental confirmation would give scientific grounding to the world cycle concept. This would propel other branches of knowledge - biology, geology, genetics, history, linguistics, astrophysics and astronomy, towards new paradigm of 'world cycle', and usher in a scientific revolution, along the lines visualised by Thomas Kuhn in his book "Structure of scientific revolution".

While, people in past have come to conclusion of possibility of universe repeating in identical cycles, nowhere, a scientific or rational attempt to estimate the size of time cycle has been made. Among the modern physicists, Poincare, championed the cause of an eternal cosmos repeating itself in identical cycles, however, he could only establish what is now called asymptotic recurrence. What this means is that given a system of finite number of particles, in a finite volume, the positions and velocities of all particles will be observed

to repeat, if one waits for a sufficiently long time. This long time, could be even infinite - hence the name asymptotic (tending towards infinity) recurrence. Time period for recurrence is called Poincare period. An attempt to apply this idea to the whole universe, given the present state of knowledge of dynamical laws governing particle motions and interactions, yields astronomical high figures, of the order of billions of years at least. However, this cyclic time picture is not in complete accord with Godly Knowledge propounded by Brahma Kumaris - because the recurrence period in Godly Knowledge is only a few thousand years.

## 14.2 Correspondence Principle.

What must be the relation between laws in cyclic time and linear time? Clearly, linear time can be regarded as a special case of cyclic time, with time of repetition being infinite. This can be geometrically visualized as follows. Cyclic time is represented as a circle and linear time as a straight line. Now imagine the straight line touching this circle. As the size of circle increases, it gets closer and closer to the line. In the limit when the radius of circle becomes infinite, it coincides with straight line. This is well known geometrical result, that a line can be regarded as a circle of infinite radius. This suggests following correspondence principle between cyclic time and linear time -

Laws of cyclic time should tend towards those of linear time, as the size of time cycle tends to infinity. This limit may be termed the linear time limit. This gives a clear clue to cross-check formulation of cyclic time laws, i.e., they should match the presently known linear time laws, when the size of time cycle is made infinite.

It should be clear to reader, that above correspondence principle is a most natural guiding light on this research. Other laws which follow naturally are discussed below.

## 14.3 Laws for Cyclic Change

Recurrence of all events in a finite time, means that the original configuration of universe is restored. This recurrence in finite time, is different from Poincare's asymptotic recurrence, which is based upon conventional dynamics. The right approach to solving the finite recurrence problem is, to re-work the behavior of particles, adopting the finite recurrence idea as a hypothesis or postulate. This yields

the following dynamical laws for finite recurrence, in time period  $T$ , on which one would have to base one's equations of motions, and particle interactions -

- (a) All particles return to their original position, with original velocity, acceleration etc., at the end of time cycle. This law is fairly straight forward. It also implies, (a) All particle paths are closed, (b) Time taken by all particle to complete their closed paths is equal to recurrence time.
- (b) Total change of any particle over a single time cycle is zero. That's how, the particle would have the initial momentum, energy etc., at the end of time cycle.
- (c) Change in movement from Point A to Point B on time cycle is inverse of change in movement from Point B to Point A. This time movement is unidirectional. Thus total change over cycle is zero.
- (d) Consider the case when Point A is very close to Point B, so that they are infinitesimally close to each other. Thus the distance between A and B is infinitesimal, while the distance from B to A is equal to complete time cycle. The change between A and B can be regarded as instantaneous change. It follows from law 3 above, that this instantaneous change is reverse of change during rest of time cycle. This change could be in anything - energy, momentum etc., of a particle, during a collision or interaction and is negative of the change undergone, throughout the rest of the time cycle. That's how the total change in the complete time cycle would be zero. This is an important constraint in cyclic time, but is missing in linear time.

These laws appear to yield a basis on which a new physics compatible with new Spiritual Knowledge can be developed.

## 14.4 Links between Space and Time

Next I consider issue of size of time cycle. I consider the special case of closed universe - i.e., in which particles do not keep moving indefinitely into space, but circle around the universe and come back to their starting point. The idea here is that -

size of time cycle in  $N$  years, circumference of universe should be  $N$  light years.

Since, light is conventionally regarded as the fastest material particle, it is required that circle of light in a single time cycle should have

the size of few thousand light years. This therefore should be the circumference of the universe, in which matter exists. In turn, this figure gives a universe radius of about one thousand light years. This means all the astronomical distance calculations would have to be revised, keeping in mind curved nature of space and time, rather than assuming them to be flat.

## 14.5 Size of Time cycle - Dirac's Large Number Hypothesis

Dirac, one of the founding fathers of quantum mechanics, had formulated an interesting hypothesis -

Ratio of universe radius and electron radius, equals ratio of electromagnetic attraction between electron and proton, and gravitational attraction between electron and proton.

One obtains very large numbers when one takes these ratios. For example, universe (the biggest physical object) is much, much bigger than electron (smallest physical object), and hence the ratio is very high. Similarly, electromagnetic attraction between electron and proton is much, much stronger, than gravitational attraction between these two particles. These large numbers turn out to be of the order  $10^{40}$  (i.e., 1 followed by 40 zeros). While these numbers are not exactly equal, and cannot even be worked out precisely, only order of magnitude estimates are currently known. Dirac, used electron's classical radius (about 10-13 cm) in his equation, as a measure of size of electron, and obtained a figure of few billion light years for universe size. However, electron radius has recently been determined by so called Penning trap experiments, and yields a figure of  $10^{-20}$  (decimal followed by 20 zeros) centimeters.

These considerations suggest that the figure few thousand years for size of time cycle may have strong scientific grounding, which needs to be properly investigated. Main considerations to be established are the Dirac's large number hypothesis (DLNH) - which as such does not have a rigorous foundation, but is only an empirical observation, and the relation between size of time cycle and size of universe. I am optimistic, that such a formulation is shortly forthcoming,

## 14.6 Unforced Motions

High school students are taught Newton's first law of motion, which states that every body continues in a state of rest or uniform rectilinear motion, unless acted upon by an external force. This law was actually initially formulated by Galileo - Newton's original contribution lay in formulation of the second and third laws of motion. Second law states that acceleration of a body is inversely proportional to its mass and directly proportional to the applied force. While the third law states that action and reaction are equal and opposite and act on different bodies. These three laws form the basis of classical physics, based upon which other developments, of classical mechanics, celestial mechanics, statistical mechanics, have occurred. Cyclicity of events requires that all particles return to their original position at the end of time cycle, whereas Galileo-Newton first law of motion would suggest that particles would continue to move in a straight line, and therefore at the end of time cycle, would be at a large distance from their initial starting point. How do we resolve this conflict? Clearly discussion is only for particles which do not collide or interact with other particles, throughout the time cycle, and thus are in preview of first law, which considers motion without forces.

Let's consider how the first law of motion should be modified, when the universe is repeating itself in identical cycles. Clearly, if time is cyclic, all particles should resume their original position, after completion of the time cycle. In the formulation of first law of motion, given above, this is not possible in a straight forward manner, and additional constraints are required. For example, if the universe is a higher dimensional sphere (hypersphere), with circumference such that, in a single time cycle, light particles (photons) are able to travel around the universe and return to their starting point, then at least light particles, have resumed their original position at the end of time cycle. However, particles travelling slower than light will require a longer time period to complete their circle of universe, and therefore will not be at their original position when the time cycle is completed. In a cosmological model with cyclic time, additional constraint has to be imposed on free motion of particles.

Since, incorporation of non-Euclidean geometry in physics, with advent of general theory of relativity, propounded by Einstein, concept of free motion of particles has been gradually redefined. If the space itself is curved, then straight lines do not exist. For example, on a plain, a stream of water can flow in a straight line. However, if the stream is on a mountain, it takes a curved path - the path of

least resistance or obstruction. This is the concept of geodesic. The curved path taken by a stream of water on a mountain is an example of geodesic motion. Thus what we require in cyclic time, is closure of all geodesics, i.e., closure of all particle paths in a single time cycle. What this means is, no matter what path a particle takes, it should return to its starting point in a single time cycle. Thus a re-formulation of first law of motion, when no forces are acting on the particle, is as follows

Natural particle paths are circles whose radii are directly proportional to particle's velocity.

Interestingly, ancient greeks believed, that natural particle paths were circles, rather than the Galileo-Newtonian straight lines. Their conclusion was based upon the apparent daily rotation of heavenly bodies around the stationary earth based on belief in Aristotelian cosmology. However, the Greek first law of motion, was based upon the 24 hour cycle of day and night. In contrast, our new first law of motion is based upon identical repetition of events in cycles - the so called, Brahma's day and Brahma's night.

## 14.7 Forced Motions

As indicated above, first law of motion in cyclic time states that inertial motion of particles is on a velocity dependent circle. However, what happens when the particles are interacting, colliding with each other? How is recurrence being ensured in presence of collisions, and forces, which modify natural geodesic motion defined in first law, which would otherwise ensure recurrence? This is the purview of second law - motion in presence of forces.

It is clear, that where as some particles may interact, only a few times (such as weakly interacting neutrinos), other may interact many times (such as strongly interacting hadrons). There may be exceptional particles, which may not interact at all, due to sheer chance. Therefore, what is required is a simple rule, which will ensure recurrence, of initial position, velocity and acceleration of the particle, irrespective of how much it has interacted. This is possible by defining a second law of motion as follows -

Disturbance of original pure motion of particle, induces a metric force on the particle, which is proportional to inverse powers of remnant time in the time cycle, and leads to restoration of the original configuration in a violent manner.

What the law means is that motion of a particle after a collision is not the simple circular inertial motion defined in first law, rather,

it is an accelerated motion which will restore its original position, velocity, acceleration etc., at the end of time cycle. The source of this acceleration, is attributed to the space-time metric which will re-define or modify natural geodesic motion of the particle and ensure recurrence. Recurrence geodesic means, a geodesic, along which the particle's motion will lead to restoration of original configuration. Thus, the metric (defining recurrence geodesic) as experienced by a particle, will depend upon its complete past history, and critically on its initial configuration, at the start of time cycle.

This disturbance of original pure motion due to interactions can be regarded as the natural mechanical entropy, - a dis-order of trajectories, which increases through out the time cycle.

This mechanical entropy is reduced to original level, during the final violent movement of the particles, when the restoring metric pseudo-force becomes un-opposable by all other interactions. This final motion will be experienced as destruction, by sentient creatures. Thus in this second law, destruction, entropy increase, as well as entropy restoration, all are inbuilt.

Entropy need not be introduced as an empirical idea in thermodynamics, which keeps increasing, but follows naturally from second law. Second law of thermodynamics (increasing entropy) thus is inbuilt within second law of motion.

This new second law of motion in cyclic time leads to conventional linear time behaviour, in linear time limit. As size of time cycle tends to infinity, restoring, metric pseudo-force will always be zero, hence subsequent motion of a particle after an interaction, will be the conventional inertial (straight line). Entropy will also keep on increasing, - there never will be a moment of entropy reduction.

## 14.8 Eternal Particles

One may object that in this paper, we have not examined creation or destruction of particles, and have assumed particles to be everlasting. However, if there exist any fundamental particles, they are likely to be eternal. In any case, even Newton and others assumed eternal particles, while developing their dynamical theories, and so we can be excused in this enquiry. It may however be possible to take into account creation and annihilation of particles, at a future date.



# Chapter 15

## Faster than Light

Einstein had suggested, following negative result of Michelson-Morley experiment that speed of light was a universal constant, independent of velocity of observer, and further, no material signal could travel faster than light. This postulate of constancy of velocity of light became foundation for special theory of relativity, and also led to discovery of the famous formula  $E = mc^2$ , which became the basis for building of atom bomb. Theoretical physicists have been studying tachyons, hypothetical particles traveling faster than light. Tachyons have some very interesting properties, which are of interest not only to physicists, and philosophers of science, but also, spiritualists. In this paper, I narrate these properties of tachyons, and their relevance to spirituality.

Among the most interesting properties of tachyons, is that they travel backwards in time. This special property comes, from the equations of special theory of relativity, in which time and space get mixed up, via observers' velocity and its ratio with speed of light. Among the other interesting effects of special relativity are, that as the velocity increases, the clocks slow down, lengths contract, the object becomes more massive. All these predictions have been verified experimentally.

The special relevance of tachyons to spirituality, is via, their superluminal (faster than light) property, specifically in the realm of thought propagation. It is felt that thought communication is not within the restriction imposed by the light speed limit, and must be superluminal. Thoughts therefore must be propagated on some sort of tachyonic waves, originating from the metaphysical soul. Baba says that thoughts of children reach him, even before they occur to the children. This statement is in complete accordance with thoughts being propagated on a tachyonic wave. Because as mentioned earlier, a particle traveling faster than light, propagates backwards in time,

and therefore reaches its destination at a moment earlier than that at which it originated!

Another interesting property of tachyons is in connection with what are called as black-holes. Reader may be aware, that black-holes are supposed to be holes in the fabric of space-time. In traditional physics a black-hole is created when a massive star starts contracting un-stoppably under its own weight, and finally it literally disappears from the physical universe, leaving behind a gaping hole in space, having a mass equal to that of the original star. For this to happen, the star must be more massive than what's the so called Chandrasekhar limit, discovered by Indian Nobel laureate Subramaniam Chandrasekhar. This limit is 1.3 times the mass of our sun (calculated in the usual Newtonian Copernicus model). Indian physicist Negi and his co-workers at Kumaun University, Nainital India, discovered that when a Tachyon falls through a black hole, it leaves this physical universe of three space-like and one time dimension, and enters a universe in which there are three time-like and one space-like dimension. This happens because of so called "topological change" in technical language. This idea was used in the book "Superluminous Man" by a French physicist (now late). This new meta-universe of three time-like and one space-like dimension may be identified with paramdham or soul world. This black-hole connecting physical universe with the meta-physical universe has been christened as "black-hole of Bangalore", by an unknown editor of Mensa Newsletter, published from UK by International Mensa, while publishing one of my articles containing this idea. The route to soul world is thus through this black-hole. It appears that the sort of tunnel vision reported in certain near-death experiences, and the being of light encountered, may be experience of traveling through this black-hole. To actually emerge from the other end of this black-hole, one would have to travel faster than light, which meshes in with the experiences of high speed reported during near-death.

# Chapter 16

## Issue of Animal Souls

Issue regarding hypothetical animal soul kingdom and tree is most interesting. Like some materialists argue against existence of souls, one can build the case whether animal souls exist or not (!?). Dadi Chandermani ji, once in a personal discussion with me, suggested that there may be a separate section for animal souls. She however emphasized that Sakar Baba, would refuse to reply to this issue, which to me in a certain sense suggests that there may not be a soul in animals. Baba's refusal becomes understandable, because the issue "if animals do not have souls, why meat eating is considered violence", would generate complications. So in my opinion Baba wanted to avoid the controversy such a disclosure may generate. Medieval philosopher, Descartes, was of the opinion that while humans have soul which is capable of communicating or communion with God, i.e., Raj Yog, but animals were mere automatons, - machines without soul. Readers may be aware that Descartes had suggested Pineal gland in brain, as seat of soul - which for his time was a radical departure from heart as seat of soul. On the other hand, Bro. Jagdish ji, chief spokes person of Brahma Kumaris, in the book "Eternal Drama, Part I", while trying to reinforce, the idea of reincarnation of human souls as humans only, has quoted an interesting example, taken from a newspaper report, of a dog taking re-birth as dog (!)- which would indirectly suggest that animals have soul. Sis. Sheelu ji, of Brahma Kumaris international HQ, Mount Abu, is of the opinion that animal souls do not go to soul world, but exist in a merged form in physical world's atmosphere only. Thus there exists a division of opinion on this issue, because of lack of clear revelation on this issue by BapDada.

Issue of animal souls is related to whether matter can generate consciousness, under certain conditions, or if consciousness is an exclusive property of soul only. We know that soul in soul world is

in a dormant stage and even lacks consciousness (!). Thus one has a new position that consciousness can be regarded as an emergent property of matter, as well as soul, and not an exclusive property of non-material soul! In a nut shell, while, animals have consciousness, which is undeniable, and while this consciousness, under certain extreme cases, can survive, one bodily death, and manifest itself in another baby animal body, (Bro. Jagdish ji's example), nevertheless, the emergent consciousness of animals is not the incorporeal soul, similar to humans. Matter generated animal consciousness, is a category of existence, different from supra-natural consciousness of soul. This animal consciousness may be capable of surviving bodily death, before disintegrating slowly in atmosphere. By contrast plants do not even have consciousness, however, they do have life. Thus if one can have matter generated life, without existence of souls in plants, why not extrapolate one step more and say, that in animals one also has matter generated consciousness, aside from life - and both these qualities manifesting themselves in the animal body and behaviour, without existence of soul. You see the problem is that if one subscribes to theory of existence of soul within in animals, the issue exists at which point in animal kingdom does the soul come in, i.e., is it there in reptile kindom, or insect kingdom, or unicellular amoeba ? Science of Biology ascribes life to all these, but does not concern itself with issue of consciousness! Certain behaviour patterns of amoeba would tend to suggest that even, unicellular amoeba has soul. On the other had, by analogy, behaviour of certain cells within human body, such as macrophages, white bloodcells of immune system is similar to that of amoeba, in which case, one would be forced to subscribe to existence of soul for each of those million cells! This would contradict the theory of one soul in human body, controlling the body from brain, near hypothalamus!

Sakar Baba and Older Dadis (Dadi Hridya Pushpa ji, for example) would sometimes refer to another mode of existence called "Jeevra". Jeevra, is supposed to be conscious component of material body, temporarily surviving bodily death, and seperating from Soul, (or soul-consciousness) at the time of death. So the animals have "Jeevra", and not the soul. This Jeevra, may be identified with "body-consciousness". In Jagdish Bhai's example, it was the Jeevra which took rebirth, because of peculiar circumstance of mother dog's death occuring because of her reaction to pre-mature death of her new-born pups, due to exposure to cold, when they were left outside in snow overnight, by mistake of her owners.. Interestingly in the same book, there is a human Cardiac death and revival example which reinforces Jeevra theory. This person reported his death experience, that there were two components of his consciousness A, and B. While B consisted of

consciousness of different parts of his body, and which appeared to be dying, he could identify himself with component A, which was a spectator to the whole phenomena. Death seemed to consist of separation of these two components. Component B can be identified with Jeevra. Jeevra is supposed to source of impurity generated in flesh due to death, and the reason why meat eating is prohibited.

In the recently started "Journal of Consciousness Studies", many mechanisms are suggested for creation of consciousness from matter, such as Bose-Einstein condensation in cells etc.. And there is a big debate going on whether consciousness is a non-material phenomena or an emergent material property. However, the debate takes support from a large extent, the evolution theory - where consciousness slowly emerged in a world devoid of consciousness.

One may be aware of 'Turing Test', suggested in 1950s by Alan Turing, Artificial Intelligence pioneer, for gauging, whether a machine was capable of completely simulating a human being. "Chess programs", were, and still are, part of Artificial Intelligence, research program. Recently created chess computer "Deep Blue", by IBM, scored 2-4, in a six game match, with World Chess Champion Kasparov - winning the first game, losing three and drawing two. This score is comparable with human challengers to world champion. For example, Vishvanathan Anand of India, in his recent challenge could win only one game against Kasparov. In the previous World Championship, Nigel Short of Great Britain, also could manage only one win. Thus the fact that animals like Chimpanzee, Gorilla, Dolphin etc., can be taught language, and more intelligent behaviour, does not reinforce the idea that they may have soul, because silicon matter based insentient computers, which lack even biological life, can be taught much more! So much more that in certain spheres, they completely exceed their human creators! Next generation of Chess computers is expected to completely outplay World Champion! Definition of Soul as mind, intellect, resolves begins to look dubious or incomplete in light of Turing test, because these aspects are simulated on machines. But let's widen the scope of our investigation a little more.

It has been argued that machines would not be able to simulate human intuition, telepathic and other occult abilities, such as extra-sensory perception! Experiments in various laboratories over the world have established beyond doubt, that human will can influence outcome of random events, such as coin or dice toss experiments. This is another capability, which the machines would not be capable of simulating. Picture of Gamblers in Las Vegas, hypnotically gazing at moving dice and willing a win. The management of these Gambling

clubs design the apparatus so that over a large number of runs, the outcome favors the club, rather than the human player. Thus if a human subject is trying to will the outcome 6, in dice toss experiments, it is observed, that number of sixes increases, in a statistically significant way! One such laboratory where these type of experiments are being done is "Laboratory for engineering analogies", at Princeton University, With Prof. Jahn, and Dunne as among the leading investigators. This is a manifestation of soul-matter interaction, whose physics is as yet obscure, but probably has something to do with quantum mechanics, and how non-material soul interacts with physical matter, and generates Karma in the process! For example, experimental studies using random number generator, based upon white noise from a semiconductor device, by lady physicist Dr. Fotini, of Athens university of Greece, has shown that, over a large number of runs, this capability of human subject is suppressed, by increased resistance of nature! Apparently this nature's back reaction has been observed by other groups also.

It is authors surmise that as physics of soul-matter-interaction matures, with possibility of experimental confirmation of soul, the issue of human and animal souls will find its ultimate solution.

# Bibliography

- [1] S.L.Jaki, *Science and Creation- from eternal cycles to oscillating universe*, Scottish Academy Press, (1974).
- [2] Stephen G. Brush, *Kinetic Theory, Vol.2, Irreversible processes*, Pergamon Press, 1966.
- [3] J. Villaroel, *Il. Nuv. Cim. A, Vol A 94, p405, (1986)*; L. Castell, *Phys. Rev. D, Vol. 6, p536 (1972)*; B.M.Schechter, *Phys. Rev. D, Vol 16, p3015 (1977)*.
- [4] I.E. Segal, *Mathematical Cosmology and Extra-Galactic Astronomy*, Cambridge University Press, 1984; V. Guillemin, *Cosmology in 2+1 dimensions, cyclic models and deformations of  $M(2,1)$* , Princeton University Press, (1989).
- [5] K.R.Popper, *Quantum theory and the schism in physics*, Hutchinson, (1957).
- [6] Aristotle, Vol. I II, *Great books of western world, Vol. 8 9 resp.*, Hutchins, R.M. ed., *Ency. Brit. Inc.*, (1952).
- [7] E.Maor, *To infinity and beyond*, Birkhauser, (1987).
- [8] A. Einstein, *Meaning of Relativity*, Hahnemann, London, 1956.
- [9] J.A.Wheeler, K.S.Thorne, and C.W.Misner, *Gravitation*, Freeman Co. Inc., (1973).
- [10] K. Godel, *Rev. Mod. Phys.*, Vol.21, p447-50 (1949).
- [11] H.M.Ravel and P.C.Vaidya, *Current Sci.*, Vol. 36, p708 (1967).
- [12] Davis, ed. , *New Physics*, Cambridge University Press, (1990).
- [13] B.E.Laurent, K.Rosuist, and E.Sriestins, *Gen. Rel. Grav.*, Vol. 13, p1093-1115, (1981).
- [14] J.A.Wheeler, in *Battelle Rencontres*, eds J.A.Wheeler, C.W.DeWitt, Benjamin Inc., (1967).
- [15] Modgil, M.S.: *Red-shift in conformal compactification of Godel Universe*, (1993).
- [16] R. Penrose, and W. Rindler, *Spinors and Space-time, Vol I II*, Cambridge University Press, (1984).

- [17] Galileo Galilei, *Dialog concerning two chief world systems*, translation by S. Drake, University of California Press, (1967).
- [18] A. Einstein, B.Podolsky, N.Rosen, *Phys. Rev.*, Vol. 47, p777-80 (1935).
- [19] A. Aspect, P.Grangier, and G.Roger, *Phys. Rev. Lett.*, Vol. 49, p91-4, (1982); Vol. 47, p460-3, (1981).