

LIFE COMES FROM LIFE, PART I: AN OVERVIEW

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0. ABSTRACT

0.1 This is the first in a series of articles on the above topic to appear in this journal. In this series, we shall explore the precise meaning of the word ‘life’, and develop a course of (heuristic) reasoning leading to the assertion that “Life comes from life”. These articles will generally be readable by the lay public. However, symbols will be used quite often in order to make the presentation compact and simple, and paragraphs will be numbered for ease of reference. As such, people with a college education would find the articles more approachable. No proofs will be presented, but some elementary logic will be appealed to throughout. It must be emphasized that the level of these articles is beyond mere philosophy; still, however, one should not conclude that the assertion ‘Life comes from life’ is proven here in a ‘rigorous’ manner, acceptable to scientists. On the other hand, using the ideas presented here, we should be close to the level where a mathematical formalism could be attempted. (In other words, we should be close to the point where a theory, whose logic is acceptable to the scientists and in which the ideas of this series of articles are central and major, could be put forward.) But, the proofs (along with their limitations, if any) will get developed only when the formalism is carried out, and such formalism will require more advanced science and mathematics, and would be beyond the scope of this journal.

0.2 *In spite of the assertions above, it should be appreciated that the topic of discussion in these articles is exceedingly profound. As such, what this journal presents is, in itself, a major step forward.*

0.3 In part I, an *overview* of the whole theory is presented in a *summary* form. This would give the much-needed insight into the more detailed elaboration that would follow later.

0.4 *The mathematical level of these articles is deliberately kept quite low (almost at the high school level), so as to make the material accessible to most readers. Still, however, these are essentially scientific articles, in which the science part is presented at a level as elementary as possible. There are no ‘computations’ done here; there is just the discussion. The ‘non-mathematical’ readers are urged to ignore the word ‘mathematics’ occurring here and there, and continue reading the contents, since they may find it acceptably easy.*

0.5 Readers interested in further exploration of the ideas presented here should look into the scientific and philosophical articles of the author, which will be referred to in the various articles in this series.

1. ACKNOWLEDGEMENT

1.1 At the outset, I wish to inform all concerned that the assertion 'Life comes from life' (Lcfl) did not originate from me. It is, indeed, the title of a book [1], which inspired me towards the exploration of the same. As stated above, the subject is profound, and the discussion necessarily involves a large number of great ideas that have been around for varying periods of time; I shall mention these as I proceed.

2. INTRODUCTION

2.1 The first question that comes to mind is: What is meant by the term 'Lcfl' (which we denote by T0 ('Theory number zero'))? Well, the context in which this term was used in [1], says that a human being is a 'spirit-soul' and not his/her body, and that 'life' is arising in the soul and not in the body. Thus, in this context, 'life' is a property of a soul (whose nature is spiritual), and not of a body (whose nature is material); it is in the body only as long as the soul is in the body. Hence, 'Lcfl' (or T0) says that what seems to be the 'life' in a body (say, B1), is present there only as a property of the soul that dwells in the body. As a soul travels from one body to another, it imparts life to it. Thus, 'life' in any particular body B1 has 'come' there not from that body B1 itself or even from some other body B2; rather, it has come there from another 'life', this 'life' being the life imparted by the soul to the body (say, B3) in which it dwelt previously. (Note that the bodies B1 and B3 may be of different 'kinds'; we shall come to this later.) We denote this theory by T1.

2.2 The above is in contrast with the idea (T2) that life is a product or a property of a body, and arises entirely from the body itself. Darwin's theory (call it T3) says that there has been an evolution of bodies here on this earth, and that the bodies of the animals and humans are the products of this evolution. If we combine T2 and T3, which many people do, we would obtain T4: "'Life' has 'evolved' here on this earth". In [1], T4 is considered fallacious, prompting the statement 'Lcfl' (i.e., T0).

2.3 To make ideas clear, it would be useful to consider a simile, although the reader is urged not to carry any simile too far. We compare the body to a TV set, and the soul to a program broadcast from a station s1. As time passes, the TV sets 'evolve', but the program that is relayed is quite a different entity. When the program is received by a TV set and is played on it, what we see may be compared to 'life'. This 'life' (even though it is displayed on the TV set) is not a property of the TV set, but is arising out of the program that is coming from s1 (which, in turn could be coming from some s2, and so on).

2.4 The purpose of these articles is to attempt to vindicate T0; this is done by showing that T2 lacks support. As stated in the abstract, the arguments in the theory presented in these articles are heuristic only, but this does set the base from where a scientifically acceptable theory could be attempted. It should be emphasized that the discussion here bypasses T3. In other words, our assertions go through independently of whether the Darwin's theory is correct or incorrect.

2.5 In this article (i.e., in part I), we now proceed to present a broad skeleton of the above-mentioned theory (which, as a whole, would be denoted by TK). This skeleton

of TK has many parts, some of which will be outlined below, and will be developed in more detail (along with other parts) in the future articles. The parts included here are the skeletons of the sub-theories TMFFR (Theory of the Mathematical Formulation of the Foundations of Reality), TFSC (Theory of the Fundamental Spiritual Correspondence), TLC (Theory of Life and Consciousness), TIAN (Theory of the Inanimate and the Animate Natures). Almost all of these have sub-sub-theories. For example, TMFFR has STR (Software Theory of Reality). Some aspects of each of these are needed in the arguments leading to T0.

3. SOME PRELIMINARIES

3.1 To help the non-mathematical readers, it is useful to include a few paragraphs on certain elementary concepts dealing with sets and logic. Firstly, a *set* is any collection of objects. An *empty set* is a set containing no objects (of the type under consideration). The word *universe* is often used to denote a collection of many sets. To exemplify, consider the universe u_1 of objects on a table, the objects being forks, spoons, apples, and oranges. If e_1 is the empty set in u_1 , then e_1 does not have any of these four objects in it. (But, e_1 could have other objects in it which are on the table, like glasses, dirt, organisms etc., depending upon what we consider to be on the table. The set e_1 is empty only with respect to u_1 , i.e., only so long as the attention is confined to those objects on the table which are of one of the above four kinds.) Let u_2 be the universe of fruits on this table, and e_2 the corresponding empty set. Clearly, e_2 does contain in it the forks and spoons. Thus, e_2 contains e_1 (written, $e_2 \supseteq e_1$), and (equivalently) e_1 is contained in e_2 (written, $e_1 \subseteq e_2$). Clearly, $u_1 \supseteq u_2$, and $u_2 \subseteq u_1$. Now, if u_3 denotes the universe of cutlery on this table, and e_3 the empty set in u_3 , then $u_1 \supseteq u_3$, and $e_1 \subseteq e_3$. Thus, in layman's language, one may consider the empty set of a universe to be exclusive of what the universe is supposed to contain.

3.2 If p and q are two sets inside a universe, then $[p.q]$ shall denote the *common* part of p and q , i.e., it is the set of all objects in this universe which are inside p and also inside q . Thus, for example, in (para) {3.1} above, we shall have $[e_2.e_3]=e_1$, since e_2 contains e_1 and the cutlery (but, no fruits), and e_3 contains e_1 and the fruits (but, no cutlery). The set $[p.q]$ is often called the *intersection* of p and q .

3.3 If g and h are two sets inside a universe, then $[g+h]$ shall denote the *union* of g and h , i.e., it will contain all objects that are in g , or in h , or both in g and in h . Thus, we get $[e_2+e_3]=u_1$, since e_2 has cutlery, e_3 has fruits, and both of them have e_1 , and since u_1 consists of fruits, cutlery, and e_1 .

3.4 If c is a set inside a universe, then c^\sim shall denote the set of all objects in this universe that are *not* in c . The sets c and c^\sim are sometimes called *complements* of each other. Thus, in u_1 , if c is the set of fruits and d the set of cutlery, then we get $c=d^\sim$, and $d=c^\sim$. Note that, in u_1 , both c and d contain e_1 , so that $[c.d]=e_1$,

3.5 There is a subtle point that must be emphasized here. As mentioned above, the set e_1 is empty so long as it is considered in u_1 . Note that e_1 is not empty if other things that are on the table are recognized. Thus, if u_0 is the set of all material objects on the table, then, with respect to u_0 , the set e_1 is non-empty. *Thus, in general, the empty set inside a universe is empty only with respect to this universe, but otherwise non-empty (depending upon what bigger context is considered by us).*

4. THE DIVINE AND THE NATURE

4.1 We shall use the symbol V for The Divine. To 'define' V, we proceed as follows. Consider any universe U1 in the Reality (as we can imagine), and let E1 be the empty set in this universe. Consider another universe U2 with empty set E2. Consider U1 and U2 to be inside a bigger universe (say, U12). (This can always be done.) Consider the common part [E1.E2], and denote it by E12. Now consider other universes, say U3, U4, ..., and so on, with empty sets E3, E4, ..., etc. Intersect E12 with E3, intersect the resulting set with E4, intersect the resulting set with E5, and so on. *Imagine taking the intersection over the empty sets of 'all' possible universes; call the 'final' result as V.* (The words 'all' and 'final' will be elaborated in later articles.) Thus, in layman's language, one can think of V as the TES (totally empty set) or, in brief, the Void.

4.2 *Thus, we set up the fundamental correspondence (part of TFSC): " V corresponds to The Divine.", where V is as defined in the last paragraph.*

4.3 But, this is not Void-ism or Nihilism, or (in Sanskrit) 'Shoonya-vaada' (meaning Void-ism), even though philosophers have propounded such theories, which say that basically, there is nothing else except a 'void'. *According to the author, a theory such as Void-ism is a serious misunderstanding. It is like talking about something (say, Z), and at the same time saying that the 'IDEA of Z' is nonexistent. The contradiction emerges because if the 'IDEA of Z' is nonexistent, then we cannot talk about Z.*

4.4 Note that $[V.V]=V$, and $[V+V]=V$. Thus, adding V to itself (i.e., doing the plus operation) gives only V. Thus, V can 'multiply itself' infinitely. From this, it will be shown that the natural numbers 0,1,2,3,...., are implied, leading to the 'creation' or 'existence' of mathematics. (This conforms to a saying of the great logician and thinker Kurt Goedel, that mathematics is the study of 'pure sets' (i.e., 'subsets of the empty set').)

4.5 Let N denote 'Nature'; then TFSC and TIAN say that N is made up two parts, namely, IN (inanimate nature) and AN (animate nature), and that $N=V\sim$, and N can be considered to be 'the nature of The Divine'. V and $V\sim$ together (i.e., $[V+V\sim]$ is 'The Whole', or 'All that there is'. Note that $V\sim$ (which denotes all that there is other than V) is a bye-product of V alone using the operations of taking union and intersection of sets, and other mathematical operations.

4.6 'IN' essentially consists of mathematical structures that are formed as a part of 'mathematics' (that, as mentioned above, arises out of V). Some of these structures are complex and large enough so as to correspond to something like the physical universe in which we live. There are innumerable such universes. For any such 'universe' U, the mathematical axioms that define U and the structures that exist in U correspond to (what would be experienced as) the 'Physics' of U.

4.7 Since The Whole 'evolves' out of V alone, V can be called 'Complete'.

4.8 Thus, for example, the above supports the first line of Isha Upanishad: "om poornama ad`aha, poornama id`am, poornaat`a poornama ud`achyat`ay// poornasya poornamaad`aayay poornama ayva avashishyat`ay"(The Divine is Complete there, Complete here, and from the Complete only the Complete emerges; if from the Complete the Complete is taken out, then only the Complete remains). To see this, we firstly observe that V is Complete (unconditionally). Hence, V is Complete 'everywhere'. Also, obviously, V contains V only, so only V can emerge from V. Furthermore, as will be elaborated in later articles, it is easy to see (in view of the fact that V is the TES) that if V

is 'taken out' from V , then V will be the remainder. *Thus, it is, indeed, extremely interesting that a fact from modern pure mathematics is in exact correspondence with a spiritual assertion which was made several thousand years ago. I should add that this is not a mere fluke as some may think. Indeed, as will be shown elsewhere, most of the major spiritual assertions satisfy such a correspondence!*

5. CONSCIOUSNESS AND LIFE

5.1 TFSC and TLC say that V is 'conscious' of V , and also of all of $V\sim$. and furthermore that 'consciousness' is a property associated with V only. This is the fundamental axiom of this whole theory.

5.2 TFSC and TLC say that 'AN' consists of structures of the form (V, W, X) , where W and X are in IN , and V is 'associated' with them. Here, W is a set of 'links' of V to $V\sim$, and X (called, a 'body') is in IN . V is 'alive' and 'animate', and so is every entity (V, W, X) in AN . An entity (V, W, X) in AN will often be denoted by E , this fact will be expressed by writing $E = E(V, W, X)$, which means that E is a function of V, W , and X , in the usual mathematical sense. (In layman's language, this means that E is dependent on V, W , and X .) In E , the 'links' W are, mathematically, of the form of 'logical restrictions' on V , the 'bigger' the W is, the lesser the 'consciousness' of E . The 'consciousness' of E depends also on what X is. We may note that in order to 'tell' what X is, one will have to explain what kind of universe X is contained in, and what kind of object X is in that universe.

6. THE NATURE OF REALITY

6.1 Consider entities E (of the form (V, W, X)), introduced in the last paragraph. Then, according to TLC, the 'reality' as 'perceived' by E is the result of the 'consciousness' of E of some part of N . Since, for all entities E , the consciousness of E 'depends upon' (in a mathematical language, 'is a function of') the corresponding X and W , we can say that the consciousness is relative to X and W . Now, of course, V is the same for each entity. However, X and W differ from entity to entity. Thus, the perceived reality of an entity varies from one entity to another, even though N is the same.

6.2 Although the perception of reality varies from entity to entity, that which is being perceived (namely, N) is the same.

6.3 The TMFFR and the TLC say that N is constituted of all the various mathematical structures that can exist. *Thus, deep down, we live in a reality that is basically mathematical in nature rather than physical. Each mathematical 'universe' is 'ruled' by the axioms and the logic that define it. These same axioms that are responsible for the 'birth' of the universe inside a given mathematical system, are also responsible for the 'death' of the universe inside that system. The perception of physical reality by an entity E is only a consequence of the 'association' of V with E . Because of the presence of V , consciousness is produced in E ; however, this consciousness is a function of X and W , so that the reality perceived by E is uniquely E 's own. On the other hand, given two entities E_1 and E_2 with corresponding X_1, W_1 , and X_2, W_2 , the reality as perceived by E_1 and E_2 may have a common part, which could be 'large' or 'small' depending upon the X 's and the W 's. (It is because of this common part that, for example, humans are able to relate to each other.)*

6.4 *What is considered as ‘matter’ in chemistry and other sciences is only a perception by us of underlying mathematical structures.* In the sciences, when one reaches the stage of the study of a phenomenon where one has a mathematical model of the phenomenon that predicts the phenomenon with a fair degree of accuracy, one feels satisfied. *However, TMFFR and TLC say that, deep down, the (physical) phenomenon is a mathematical structure only; it is our consciousness that perceives this structure as a (physical) phenomenon.* The scientific study of the phenomenon is thus an effort to go back to the deeper mathematical level, and this effort then leads us to the underlying model, as one should expect.

6.5 To partly illustrate the remarks made above, consider two entities E1 (a lion) and E2 (a human), and their perception of ‘green light’ (gl). Now, gl is in IN, and is actually an electromagnetic wave (say, emw). It is well known that emw is a mixture of sine waves with particular wavelengths. Thus, gl is completely describable by a mathematical ‘structure’ (often called a ‘model’). However gl is perceived differently by E1 and E2, since E1 sees only a shade of gray, while E2 sees the green color. Similarly, it is well known that certain high frequency sounds are audible to certain insects (though not to humans). Also, certain dogs can smell blood, while humans cannot; and so on.

6.6 The Divine, which is represented by V above, is sometimes called the “Super-soul”. In contrast, the (V, W) part of E may be termed “the soul of E”. Thus, the difference between the Super-soul and a soul is that there is no W associated with the Super-soul, while a soul does have a W attached to it. In logical-mathematical terms, the W acts as a set of restrictions on V. Thus, in a sense, because of W and X, the entity E has less ‘freedom’ and less ‘power’ than V. Among humans, the W is experienced as a bunch of attachments, aversions, emotions, desires, etc., and produces personality features such as those associated with what is commonly called ‘goodness’, ‘passion’, or ‘darkness’.

7. THE COSMIC TREE

7.1 Consider a universe that (like ours) is endowed with a notion of ‘time’. Then, such a universe has the form of a ‘mathematical tree’ (which is a structure similar to an ordinary tree, with ‘nodes’ giving rise to zero, one, or more ‘branches’). As time passes, the ‘development’ of such a universe is like the flow chart of a computer program, which (mathematically) is like a ‘tree’. This is the Theory of the Cosmic Tree (TCT). *Thus, in particular, TCT says that our own universe has this property, i.e., it is like a tree.* Because of its similarity to a computer program, TCT is also referred to as the ‘Software Theory of Reality’ (STR), since a computer program is often called ‘software’.

8. THE QUANTUM REALITY

8.1 *The theories TMFFR, TFSC, TIAN, TLC, and TCT mentioned above, together with a few others, constitute the author’s theory TK of the Foundations of Reality (FR).* A part of this deals with the fundamental particles in Physics, a topic that is often referred to as ‘Quantum Reality’ (QR).

8.2 Since the mid-1920’s, quite a few theories of QR, i.e., theories concerning the nature of what appear at present to be the ‘fundamental’ ‘particles’, have been put forward [2]. The main ones are: #1 (Bohr, Heisenberg) There is no Reality, the act of observation or measurement creates what we see; #2 (Wheeler) Reality is created by the

observer; #3 (Bohm) The Whole (which does not equal the sum of its parts) should be taken into account; #4 (Everett) Every action creates multiple universes corresponding to all the different possible choices; #5 (Birkhoff, Finkelstein) The basic logical system is different; #6 (Einstein, Schroedinger, de Broglie) The universe is made of objects which have properties that are independent of the observer; #7 (von Neumann, Wigner, Stapp) Reality is created by the consciousness of the observer. *The author's theory is different from all of these in a very basic manner, but in an interesting way it gives some credence and support to each of these theories (though they diverge quite a bit from each other). It is as if these other theories give a partial picture due to incomplete insight.*

8.3 It should be noted that these other theories are theories of QR only, while the author's theory is a theory of Reality as a whole, which also includes the spiritual experience of Man. Many scientists and philosophers dismiss the 'spiritual experience' as non-existent and fictitious. However, since the dawn of history, all people who have advanced in the spiritual field know that their experience is real. The author's theory shows that, indeed, that should be the case. According to the author, *'Spirituality' is what rationality would require one to do, if he/she had the total perspective of Reality. As such, Science is only a part of Spirituality, the part that deals only with the mundane. In view of this, the author's theory provides the comprehensive unitive picture.*

9. LIFE COMES FROM LIFE

9.1 We now come to T0, which asserts 'Lcfl', the basic assertion of this series of articles. The question "What is life?" has haunted thinkers for a long time. Many biologists relate 'life' to organisms that have the capability to reproduce. However, in Applied Mathematics, people have been working on "self-reproducing automata", i.e., machines (represented by mathematical structures) that could reproduce themselves. Clearly, such machines would not be alive. According to the author, only that entity can be considered to have life, which has the ability to be conscious.

9.2 *We shall argue that a 'computer' cannot be alive. Indeed, a computer cannot be conscious. Notice that a computer could perform operations that are rational, without being conscious of them.* For example, a computer could translate the sentence "Pour milk into the glass" from English to Chinese without being conscious of what it signifies. We can even make a robot that, hearing this sentence in Chinese, picks up the bottle of milk, takes a glass, pours the milk in the glass, and says in English "Please take this", without really being *conscious* of its acts.

9.3 With the above context, the assertion 'Lcfl' boils down to saying that an entity like E (in {6.1}), cannot arise in IN. *The 'proof' of 'Lcfl' is carried out by working on the idea that it is not possible to arrive at V by conducting mathematical operations on the entities in IN only.* Now, since a living entity E must be of the form (V, W, X), it must involve V. From this, one deduces that E cannot arise inside IN, or, in other words, that 'Life comes from life'.

9.4 How did the writer of [1] come to T0, without thinking through the associated science or mathematics? The answer is that he, perhaps, had a very 'small' W, and consequently his 'consciousness' (appearing to us, as his 'intuition') was very large. This, in turn, led him to 'see' the truth of the said assertion.

10. REFERENCES

[1] Bhaktivedanta, A. C. (19??) Life Comes From Life. Published by the BBT press, Los Angeles, Ca.

[2] Herbert, N. (1985) Quantum Reality. Published by Anchor, Doubleday, New York, NY.

NOTE: Detailed references will be provided in future articles.

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THE END

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