

The Unity of Patterns

Discovering the Hidden Connections Between Life, Mind and Society

- K. Babu Joseph'

The Hidden Connections: A Science for Sustainable Living.

By Fritjof Capra. Flamingo, 2003. xv + 272 pp.

That traditional Indian philosophy's most important contribution is the concept of unity in diversity is too well known to be described. In science too there is a growing awareness that the same kind of patterns are encountered in apparently unrelated domains. A pertinent example of such parallelism is seen in physics and biology: the so-called unified theories of living and non living matter. The quark model seeks to explain the structure of all matter in terms of its constituents called quarks and gluons, or leptons while genetics seeks a description of all life in terms of DNA and the cell environment. In both cases the same trend is evinced: a desire for unity, simplicity and elegance.

One of the purported aims of complexity theory, a modern paradigm spun from the yarns of non-linear science, is a plausible explanation of the phenomenon of life. Like the unity models mentioned above, it is also a reductive framework as Fritjof Capra strives to show in his recent book *Hidden Connections* in which he successfully articulates a unified perspective of life, mind and society. There is also a systemic analysis of several critical issues of the present time that one may be amused to read. In part one, the theoretical framework, though not original, is laid while part two explores an alleged parallelism between human organizations and a living system. The analogy is stretched to the point where links are envisaged between global capitalism and biotechnology's

ethical dimensions. The concluding chapter gives a sketch of attempts currently being made by various NGOs across the world, for injecting human values into the supposedly unscrupulous agenda of global capitalism, the new social order created by globalisation.

In some of his earlier works such as *The Turning Point*² and *The Web of Life*,³ the author introduced a life-centred approach to problems in the social domain. In particular he studied paradigm shifts in a number of disciplines. The upshot of his multifaceted investigations is the emergence of what he calls the systemic view. Central to his analysis is the use of a battery of concepts taken from chaos or complexity theory. The essential point is that mathematical concepts that are found useful in describing the behaviour of living systems seems to provide a suitable framework for understanding all types of sustainable institutions. A satisfactory definition of life in terms of its characteristics and requirements is given. The most elementary form of life is not the DNA or RNA or protein but the cell that contains all these ingredients. It is described as “a membrane-bounded self-generating, organizationally closed metabolic network that is materially and energetically open.” The cell operates away from equilibrium, as long as the metabolic processes outsmart the decay reactions. Technically speaking, such a phenomenon causes the emergence of dissipative structures in the sense of Illya Prigogine.

A careful reading would reveal the fact that a lot of material introduced in the two other books listed above finds its way again into the present book. As an instance, we cite the following statement occurring for the first time in *The Turning Point*. “We live today in a globally interconnected world, in which biological, psychological, social and environmental phenomena are all interdependent.”

He calls this view the ecological perspective. In the book *The Web of Life* the very same idea is recycled under the label, system thinking, a concept apparently borrowed from systems engineering which appeared during the 1960-70 period. This branch of study, incidentally, attempts to predict emergent properties of a system which reside in the system as a totality, and not as a mere sum of its parts. What these

observations suggest is that one has to dig deep into the earlier works for a fuller grasp of the terminology used in the present work, despite several cosmetic changes that have been made. These remarks are not meant to disparage Capra's contribution, far from it. All I want to say is that his ideas have evolved over time into a matured form.

Capra summarises Morowitz's 1992 explanation of the mechanism underlying the formation of closed membranes or vesicles, the precursor to a living system. According to this theory, lipids through association with water molecules which have an electric polarity, can give rise to membrane structures having properties similar to those of the cellular membranes. Membranes developed through the condensation of lipids into droplets which in turn, under the influence of waves, spontaneously configured themselves into vesicles. Evolution is the trend towards greater complexity resulting from the incorporation of elements such as carbon, hydrogen, oxygen, phosphorous and sulphur into the protocells through processes energized by sunlight. Some molecules assumed the role of catalysts that drive certain crucial reactions. The next stage is the emergence of networks of interlinked chemical reactions, a non-linear dynamic effect. The final step in this tortuous chain of processes is the appearance of life through the interplay of proteins and nucleic acids in accordance with the scripting called genetic code. The first protocells must have formed about 3.8 billion years ago. As already pointed out in *The Web of Life*, there may have been three principal modes of evolution: mutation, gene transfer and symbiosis, commencing with bacteria and climaxing with humans.

The book contains an interesting discussion of the so-called Santiago theory of cognition developed independently by Bateson, Maturana and Varela in the 1960s and 1970s. Cognition or the process of knowing, according to them, must be identified with life. They propose a mechanism called autopoiesis which involves the self generation of living networks. The appearance of new structures is the outcome of new connections in the autopoietic network. Again, for readers who have previously read books like *The Web of Life* and *Uncommon Wisdom*[†] both by the same author, there is not much stuff by way of new arguments in this respect. Varela is given credit for the view that consciousness-study should focus on the physics, bio-chemistry and

biology of the nervous system besides the non-linear dynamics of neural networks. Experience is an emergent phenomenon the likes of which are well known to arise in complex systems. The relationship between experience and social reality may be traced in language the proto-form of which is gesture.

The major contribution of the present work, which is well documented and heavily referenced, is a synthesis of three concepts that govern living and non-living worlds. These correspond to the study of form or pattern of organisation or relationships, the study of matter or material structure and the study of processes. In particular the cellular metabolism or living things is a pattern of relationships among specific chemical processes. Evolution is the mechanism of structural changes in this network pattern that leads to conscious experience and conceptual thought. Why is it that there is such a manifestation? Why should there be 'progress' in evolution? If such processes are simply physical, the terrestrial environment need not be unique and they should occur throughout the universe and in sufficient abundance, but the observation is that life, let alone consciousness, is one of the rarest types of phenomena. There is no answer to these remarks in this thesis; however, meaning is identified as a fourth perspective having a bearing on social interaction. Self awareness is assumed to have emerged at the zenith of evolution producing the capacity to retain mental images of the external world. The basis of social life is language in so far as it involves the communication of meaning between humans. It is argued that fundamental network pattern of organizations of living systems is extendable to the social domain. A social network is one of communication involving symbolic language, cultural constraints, power equations and so forth. Principles of non-linear dynamics or complexity theory are applicable to social networks as well as life's networks.

Part two deals with problems of the present century such as leadership in organizations, the operational networks of global capitalism, turning point in biotechnology, environment, globalisation and alternative energy sources. The discussions throughout the text are within the systemic framework advertised by the author. The network is the new jargon and the assumption is that networking takes place not only in nature but also in society. Some of these networks are hardly sustainable.

For example the global market with its sole aim of moneymaking cannot continue indefinitely with its oppressive policies, argues the author. There should be a profound change in values which will halt the present depletion of natural resources, extinction of flora and fauna, and global warming. Though extremely difficult to implement in one stroke, small but meaningful disturbances here and there, now and then, may trigger an avalanche of changes engendering a new order. Recall the fall of the Berlin Wall or the end of apartheid which were complex processes in the sense of systems theory. So, taking the cue from the author, we may believe that the situation in the world today is not totally hopeless. There is hope round the corner.

Notes

1. Dr. K. Babu Joseph is currently the Dean in Rajagiri School of Engineering and Technology, Kakkanad , Kochi - 682 030.
2. Fritjof Capra, *The Turning Point: Science, Society and the Rising Culture*, Flamingo Imprint 1983. First published by Simon and Schuster, U.S.A and by Wildwood House, U.K., 1982.
3. Fritjof Capra, *The Web of Life: A New Synthesis of Mind and Matter*, Flamingo Imprint, 1997. First published by Harper Collins, U.K., 1996.
4. Fritjof Capra, *Uncommon Wisdom*, Simon and Schuster, U.S.A, 1988.