

LIFE AND MIND: IN SEARCH OF THE PHYSICAL BASIS by Savelly Savva (Ed.).
Victoria, BC, Canada: Trafford Publishing, 2006. Pp. ii+262. ISBN
1-4251-1090-8.

When looking at the achievements of modern physics, biology, and chemistry, one might be fascinated by the many discoveries of fundamental laws of nature, their simplicity in mathematical description, on the one hand, and their complexity considering their manifestation in nature on the other. With increasing structural complexity, it no longer seems possible to make a quantitative description of the internal processes of molecules and biological macromolecules, and their interactions. Physical laws are easy to study in laboratory environments where the studied object is well-isolated from complex interactions; biologists have used this approach and have discovered many cellular and genomic processes.

However, even when keeping knowledge about these discoveries in mind, one might still be overwhelmed by seeing the self-organizing power of nature in generating a living world in such a manifold environment. A well-versed scientist might come to the conclusion that what is known about life is not enough to explain *why* life emerges out of physical nature.

The book *Life and Mind* edited by S. Savva addresses these questions by presenting various approaches and paradoxical findings that direct our attention to the assumption that in order to study life we have to broaden our view and go slightly beyond the knowledge base of physics, chemistry, and biology at its present stage. As a consequence, the scientific reader has to be very open-minded. He has to think in slightly different ways and discuss phenomena and findings that seem to be out of line with or at least not explainable by the current state of physical understanding. In order to profit from the message of the book, a certain amount of tolerance in terms of not denying flatly or ignoring unusual thoughts and paradoxical results is required from the reader. But if the reader can share this attitude, the various contributions might open up new scientific approaches in order to study the emergence of life. This means that in the end the reader is challenged to find the answers for his various questions through further studies.

In his initial chapter, Savva introduces the term Biofield Control System (BCS) to express the seemingly intelligent self-organisational behavior of nature. The idea of an unknown structuring "field" is not new and has been proposed by several other researchers in the past, such as the idea of a "Morphogenetic field" propagated by R. Sheldrake. Beloussov supported this idea when reporting on observations in embryonic development and Drochioiu described Eugene Macovschi's concept in which "the biostructure is considered as a set of rules."

However, here a skeptical physicist might argue that the assumption of a BCS, morphogenetic field, or whatever we name it, could be used as a virtual substitute for our missing knowledge about the real nature of

the mechanisms in living organisms. These terms could be misused as pseudoexplanations, and all unexplainable and paranormal phenomena could be projected onto them. This would be similar to the archaic behavior of using the term "God" as a personality responsible for all hitherto unexplained and uncontrollable phenomena. Such a projection can be partly helpful for us in order to deal with a phenomenon at a basic level; however, we should be aware that it doesn't really answer our questions. As with the discovery of electricity, after which God was no longer the cause for thunder and lightning, we might still wait for the discovery of the real reasons and mechanisms behind the nature of life. This truth might then refine or even substitute the hypothetic BCS—and probably discover "God" for the second time. Refining those theories with the knowledge of ongoing research, we could probably change them into a powerful description of the principles of life, which we then could use in a creative way. This book presents experiments and findings that should attract our attention in order to help us realize that mind and life might obey laws and principles which go beyond the currently accepted physical and biochemical processes.

The second chapter contains four contributions to paradoxical observations in biological systems. The observed nuclear synthesis of iron isotopes in bacterial cultures is a fascinating topic but needs further research. Although those experiments seem to be done in a scientifically clean way with professional methods, they need to be continued in order to discover the principles of those nuclear reactions on a quantum physical level. Another remarkable phenomenon is reported by Burlakova and colleagues. They tell us about the effect of ultralow-dose chemical substances on enzymes and living organisms. An ultralow dose is defined as a concentration of 10^{-13} M or lower, or as a concentration below the threshold in which less than one molecule of an active substance per cell is available. In a seven-page-long table, an impressive list of such substances found in other literature is printed showing that the ultralow-dose effect should be a well-known phenomenon. As one reason for such effects not being realized, they mention the so-called "dead zones," which prevented the scientists from further lowering the dose in their studies. "Dead zone" means that when a dose is lowered, the effect vanishes first before showing up again at very low concentrations. Such discontinuous dose-effect dependencies are not yet explained, but speculations are given here.

The following two reports by Kiang and Backster focus on the mental interaction between living systems. The chapter by Juliann Kiang reports on bioenergetic treatment and its influence on the intracellular Ca^{2+} concentration in human lymphoid T cells, which could be significantly heightened. Again, possible mechanisms for the mentally induced interaction in the bioenergetic process remain vague and speculative. Cleve Backster, who became quite famous in this field for his observations of mental influence on the electrical conductivity properties in plants, presents a similar study in which he showed the reaction in plants when

positioned close to dying shrimp. Here, a kind of psychological component is attributed to plants which implies that they might empathize with other living systems. Again, the question arises as to what the underlying mechanisms for such an information exchange might be. Similar to the other experimental findings reported in this book, postulating a biofield at least gives us a term that allows us to have a picture for such spooky interactions. Interestingly enough, the data and graphs Backster presents in this book seem to be 30 years old already, and one might therefore ask oneself why he is reporting on those early studies. Despite his reference to his 2003 book and mentioning replications over the last 40 years, it is unclear whether the later studies have caused any progress in this kind of research or not. However, this seems to be a major problem in all research on paranormal phenomena. The study concepts have remained similar over the last decades, sometimes replicating early findings and sometimes not. Nowadays, we have a big data-base for meta-analysis at our disposal, which reinforces the existence of paranormal phenomena. However, as far as I can see, there is hardly any modification in the experimental design to provide additional information about a possible mechanism responsible for a phenomenon.³

This precisely should be the topic of the contributions in the third part of Savva's book on alternative physical models. Obviously, there seems to be no simple way for the inclusion of these findings. If so, they would no longer be unexplainable. John O'M Bockris mentions such topics as cold fusion, parapsychological phenomena, and UFOs, which he believes are worth researching with government funds, and that could perhaps be most efficiently done with Russian scientists because they are bright and research is cheap there compared to the US. Hal Puthoff summarizes in a few pages his brilliant research on the zero point energy field. According to his results, these energy fluctuations could explain gravitational attraction and the interconnectedness of all matter in space, and could provide us with a new form of energy. This last claim is often criticized by physicists. According to the quantum mechanical predictions regarding the zero point energy field, it should not be possible to violate the energy conservation law. On the other hand, the phenomenon of zero point fluctuations does not seem to be well understood yet. Therefore, it is absolutely worth investigating as a potential source of energy and also for its possible role in consciousness and direct mental interaction between living systems, as described previously in the book. Here, Puthoff does not provide detailed theoretical considerations or experimental findings supporting his claims, but refers to his literature.

William Tiller pictures a new model of physics. In his theoretical considerations, he attempts to overcome many limitations of conventional

³ Unfortunately, this is also true for my own research on paranormal human machine interaction and telepathy. Therefore, I am desperately searching for new experimental designs that approach the question of the underlying principles.

physics. The question would now be: how can we prove if this is more than just a pleasant philosophy? In an appendix, he presents studies with an Intention Imprinted Electrical Device (IIED) that should provide experimental evidence for some of his theories. The IIED serves as a kind of tool for direct mind-matter interaction. Tiller seems to be very straightforward in drawing conclusions out of certain findings. Contrary to the views of conventional physicists, he seems to have no problem in assuming the existence of magnetic monopoles and waves with superluminal velocity. Unfortunately, I could not follow all of his thoughts and therefore hesitate to judge them. However, at least one part of his new model seems questionable to me: How can we put things like emotions, mind, and spirit into their own different dimensions? How can their dimensional character be shown? If we cannot express the states of mind, emotions, and spirit in scales, does a dimension for them make any sense? Or is there any other significant application to this model available than just having a higher interpretational freedom that is provided by the introduction of an additional dimension?

Nina Sotina suggests in her contribution the existence of a structure in the physical vacuum, an idea that would contradict Einstein's Theory of Relativity. However, when assuming a kind of superfluid property of the vacuum, this idea becomes plausible. Her conclusions seem to be very much in line with Puthoff's approach. The idea that the structured vacuum is the cause for the intelligent behavior of simple living systems such as bacteriophages brings the picture of a biofield into physical reality. She reports on a number of studies on telekinesis and attributes the nonlocal effects to quantum mechanical origin. Interestingly, this model can be supported by the formalism of the weak quantum theory, which tries to apply the theory of quantum entanglement in complementary variables to the domain of consciousness and the nonlocal phenomena between living systems, such as telepathy and distant healing. This was described by Walach (2005).

Finally, James Beichler presents an overview of unified field theories and mentions their weakness in not being able to describe the phenomena of life and consciousness. He offers his five-dimensional single field theory (SOFT) as one solution, and after discussing it in detail with Bohm's and Tiller's theories, he also summarizes some torsional field theories.

To draw a final conclusion, in the end the reader has gained some insight into experiments showing distant (sometimes mental) interactions between living systems that are used as support, proof, or justification for alternative physical models. Interestingly, such parapsychological experiments mainly provide only evidence for the existence of unexplained mental interactions, but what is clearly missing is an experiment that is able to directly measure parameters of an alternative physical model. For example, assuming there is a structured zero-point field, then a Nobel Prize-worthy project would be the design of an experiment for verifying the existence of such a structure. Therefore, I would welcome activities that support this kind of research and make it part of the widely accepted

scientific community in order to open up a new research field at the cutting edge between biophysics/biochemistry and the still mysterious nature of life. May this book draw our attention in this direction.

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