



## The Biophysical Modelling of the Borderland Science

Janos Vincze, Gabriella Vincze-Tiszay

Health Human International Environment Foundation, Budapest, Hungary

| Received: 20.06.2023 | Accepted: 25.06.2023 | Published: 27.06.2023

\*Corresponding author: Janos Vincze, Gabriella Vincze-Tiszay

Health Human International Environment Foundation, Budapest, Hungary

### Abstract

*The three dimensional model of the sciences has the following five main layers: inorganic, organic, societal, mental, and spiritual. The biophysics is the result of the interaction at the borders of biology and physics. In order to be able to understand the substantial differences in a biological stratum, only, if we considering the psychological side of the biological order. Every biophysical experiment bears the personal intuition of the researcher and especially in the interpretation the mark of the individual prejudice (one-sidedness), inventiveness. Perhaps the most important characteristic of the living organs is their self-sustaining capability. Our decisions will be added to the human traditions our thinking could be part of future development, like successful mutations could be built in the genetic memory. In fact, we are responsible for the consequences of our thinking, actions, decisions, if they are already built in the human heritage. The organization of the psychic process within the realm of reflex-process has its three-folded division, which during its ontogenetic development became more differentiated. The nature of the psychic content, quality and source will be determined by the individual's interaction with its environment. The psychic happenings my hard to recognize, their organic substrate is provided by the individual biological structure. Biophysics is like a wife who can be recognized but not defined!*

**Key words:** physics, biology, psychology, biophysics

### Introduce

The three dimensional model of the sciences has the following five main layers: inorganic, organic, societal, mental, and spiritual. The marginal sciences are vertically and horizontally connected with the classical ones. The boundaries of different scientific branches could be considered as starting points of many facets of new initiatives for collaboration. This also could be serve as a pretext for presently unanswered problems. The nature of the meeting points of heterogeneous sciences, the so called „border sciences” is that the appearance and rules are not based upon any of known classical scientific norms. [1]

The biophysics is the result of the interaction at the borders of biology and physics. It is a result of a physical process which is connected directly to the biological and even to the spiritual manifestation of it. In addition to it the biophysics as science also study the methodology and its utilized instruments.

At the beginning the biophysicist made its research according to the rules of physics without leaving the ground of biology. [2] The goal of the modern biophysical research is to follow the rules of

development in light of its total symptoms, including the spiritual ones, in order to fit these observations into the larger image of the scientific world.

Most of the physicists feel, that one can find nowadays more exciting questions in the area of biology than that of the pure physics. To approach these questions in our time is different for a physicist than a biologist.

In order to be able to understand the substantial differences in a biological stratum, only, if we considering the psychological side of the biological order. This became more evident in pathological cases. In fact it could be unsuccessful, to cure then by physical tools only without consideration of the psychological aid.

The biophysics in mentality and technique is a synthesis of physics, psychology, and biology. In reaching a right result, the biophysics is employing the investigation methods of the mathematics.

The main goal of the biophysical cognition as that of a borderland science is to reveal and cautiously draw up the laws guiding the

motion and development of phenomena. The phenomena investigated by the biophysics are in steady fluctuation, nothing of the sort unambiguous causal relations can be determined because their origin and manifestations are based on non-linear causal connection. [3]

A causal connection characteristic in a given biopsychological case is not necessarily valid also for other singular cases, for this reason by discovering generally valid peculiarities and dependencies one must turn to statistical estimations. It can, therefore, occur that the average statistical parameter will not coincide with any individual value of the given variable.

In biophysics, the objectivity of a theory will be esteemed according to the followings: the measure of the effect and intervention to the phenomenon under study, the measure of drafting and expressivity; the level of usefulness. Every biophysical experiment bears the personal intuition of the researcher and especially in the interpretation the mark of the individual prejudice (one-sidedness), inventiveness. The reason stated by the biophysicist must mean an advance somewhere to answer of one scientific question otherwise the statement won't disclose any information. [4]

### Physics

Physics before has meant the entirety of natural science. The domain of physics gradually changed. Perhaps, in the present state of physics, we could say that it is a science dealing with the special features and laws of the moving matter.

The Bohr's theory had a great success by explaining the Balmer's formula attributed to a series of the lines of hydrogen spectrum, which Balmer achieved experimentally in 1885. The Bohr's theory had a great success by explaining the Balmer's formula attributed to a series of the lines of hydrogen spectrum, which Balmer achieved experimentally in 1885. [5]

The limits of Bohr's theory, in spite of its initial great successes, and parallel with them, became gradually evident. Further the way of development has been achieved of it was made by of quantum mechanics. With it, the golden era of physics (1920–1932) came to an end. After that year, natural scientists above all physicists became the „slaves” of politicians, military, economic and financial leaders, who decided the required scientific research directions, according to their interest for world's hegemony. Therefore, in our time the inner development of the natural sciences practically does not exist. Some surface research appears to satisfy only the demand and special interest of the fashionable economic groups of the high society. [6]

It is important to mention that János Bolyai was in full understanding that his geometry was very important for physics, especially in the structure of physical space. Therefore he gave to the title of his book „Appendix, scientiam spatii absolute veram exhibens”. (Appendix containing the real science of space). Einstein's theory of general relativity nowadays arrived to the important recognition which became its physical essence. It is generally accepted that the gravitate ion, the field of force, and the geometrical space should had their inner relations.

### Biology

During the course of the phylogenetic development, through the differentiation of living organism more new organ came to light serving for the adaptation. Those species will survive only, which

would be able to conform with the external stimuli, to use them for its inner genetics purposes, and able to eliminate harmful effects. [7]

The basis of the origin of life is understandable from its complex chemical structure, by the help of reproduction and hereditary factors. The mutations, time to time changing the building concept of these structures. During the changing pattern, new structures came out, which became more adaptable to the environment and better multiplied than others. Therefore, one can find constant growth by those structures, which are better equipped to find for their suitable environment for multiplication.

Perhaps the most important characteristic of the living organs is their self-sustaining capability. Which means that in a constantly changing environment able to maintain its relative stability, and individuality. The stability state has been made possible by the continuous exchange of matter and energy its metabolism related to its environment. To stay alive is necessary the speedy reaction to the changing circumstances. Therefore, the cells' material control is very economical. [8] This was made possible by the effect of the enzymes which created the interconnected series of transformations. The continuation of life is secured by the individual capable to make its numerous offspring.

Surprisingly, the mechanism of adaptability offers a possibility to the nature, to correct itself, to be able to create gradually more complicated structures, making it genuine, without breaking the basic rules of chemistry and physics or having a pre-determined plan.

During the phylogenetic development the brain and the nerve complex system arrives to a point where the death of the individual cannot clear out the remains of the life experience.

In the present evolution, the consequences of decisions would not be lost and be forgotten necessarily. [9] They often stay in the memory and will be built in the piled experience as the so-called tradition. Our decisions will be added to the human traditions our thinking could be part of future development, like successful mutations could be built in the genetic memory. In this point comes the question of responsibility. In fact, we are responsible for the consequences of or thinking, actions, decisions, if they are already built in the human heritage.

### Psychology

During the phylogenetic development of living organism, in a certain level appears the nerve system. Furthermore, in a continuous development the nerve system generates a new qualitative state with the function of spiritual activities. The psychical activities have their own relatively independent rules. Every person remembers about his or her past happenings, planning its future, thinking about relations, feelings encourage or discourage, every person striving, wishing, deciding, and wanting. [10]

The organization of the psychic process within the realm of reflex-process has its three-folded division, which during its ontogenetic development became more differentiated. During the ontogenetic development, the sense for cognition is supported by the abstraction capability. The human sense of cognition varies by the nature of the individual, this is the reason why one can recognize a typically personal mode of thinking, underlined by the individual phrases, construction of sentences and forms of expressions.

The relationship between the spiritual manifestation and the progression in the nerve system could be defined by the following formula: in all time when we live through spiritual happenings, reactions go through the nerve system. The nature of the psychic content, quality and source will be determined by the individual's interaction with its environment. [11]

We could talk only about a specific nature of an individual if we examine the totality of spiritual events, the person's cognitive, attitude, and assimilative capability during his lifetime. In fact the individuality of a person could be only recognized by an analysis in a horizontally employed chronological lifetime.

„Mens sana in corpore sano” (Healthy mind in healthy body). This proverb supports the fact, that the biology and psychology cannot be separated. One does not exist without the other one. The psychic happenings my hard to recognize, their organic substrate is provided by the individual biological structure. This unity built by two component which could function in separation, however their function is mutually determined.

### Biophysics

At the beginning the biophysicist made its research according to the rules of physics without leaving the ground of biology. The goal of the modern biophysical research is to follow the rules of physics to recognize the progression and its regularity in the formation of living organism. Furthermore, observe the inner development in light of its total symptoms, including the spiritual ones, in order to fit these observations into the larger image of the scientific world. Biophysics is like a wife who can be recognized but not defined!

The phenomenological equations also enable us to deal with rapid processes in living organisms and their evolution as a function of time. [12] The study of these latter phenomena is of great importance since of all the numerous processes that characterize living systems metabolism is of the most fundamental importance. Since metabolism is nothing more than an exchange of matter and energy between an organism and the external environment, it can be considered a special transport phenomenon.

Most of the physicists feel, that one can find nowadays more exciting questions in the area of biology than that of the pure physics. To approach these questions in our time is different for a physicist than a biologist. The fear of the biologists is that the viewpoint of the practicing biophysicists could create a situation in which the biologists would feel that they will be cut into Alfa, Beta, Gamma categories. In this case they would need more mathematical knowledge.

### References:

1. Vincze, J. (1980) Biomathematical elements on sympatholo-adrenal reactions to stress. *Tim. Med.* 25, 46–52.
2. Selye, H. (1974) *Stress without distress*. Philadelphia: Lippincott, 364 pp.
3. Horowitz, M. (2002) *Treatment of stress reponse syndromes*. Amer. Psych. Publ. Wash., D. C., London.
4. Vincze, J. (2007). *Interdisciplinarity*. NDP P., Budapest.
5. Sarson, E., Cobelli, C. (2014) *Modelling Methodology for Physiology and Medicine*. Elsevier P.
6. Vincze, J. (2018) *Medical Biophysics*. NDP P., Budapest, 2018.

7. Theorell, T. (1987) Stress syndromes. *Annals. Clin. Research*, 19: 53–61.
8. Vincze, J.(2021) *Biophysical vademecum*. NDP P., Budapest.
9. Vincze, J. (2020). *The Biophysical Modeling of the Apparatuses in the Human Organism*. Lambert Academic Publishing, Berlin.
10. Vincze, J., Vincze-Tiszay, G. (2020). Some Aspects of Sciences from the Biophysical Point of View. *Int. J. Software & Hardware Engin.* 8(9): 103–108.
11. Vincze, J. (2021) The Biophysics is a Borderland Science. *Phyl. Study*, 11 (5): 351–362.
12. Vincze J., Vincze-Tiszay, G. (2023). The Human Mind. *Philosophy Study*, 13(2): 60–67.