INERT MATTER
КОСНАЯ МАТЕРИЯ

Inert matter is a cosmological value indicating the initial state of matter and field, as the two main forms of matter that have arisen as assumed in the Big Bang.The symmetry of a molecular structure of the internal material-power environment, convertibility of processes, as well as variety of building mixes of isotopes are characteristic for inert matter. Inert substance is a set of inorganic and organic combinations expressed in an elementary chemical compound, weight and energy. The field of inert matter is a kind of matter having zero weight of rest, or otherwise, it is a geometrical space with infinite number of degrees of freedom. Inert matter in the Universe is represented by forms of various combinations: from space vacuum to planets, stars, galaxies, etc., in various states: solid, liquid, gaseous, etc. By and large, the system of inert matter is the Universe in all the variety structure.

Косная материя – это космологическая величина, обозначающая первичное состояние вещества и поля, как двух основных видов материи, возникших, как предполагается, в результате Большого Взрыва. Характерными для косной материи являются симметричность молекулярного строения внутренней материально-энергетической среды, обратимость процессов, а также многообразие строительных смесей изотопов. Косное вещество – это совокупность неорганических и органических соединений, выраженная в элементарном химическом составе, массе и энергии. Поле косной материи – это вид материи, имеющий нулевую массу покоя, или иначе, геометрическое пространство с бесконечным числом степеней свободы. Косная материя представлена в Мироздании в формах разнообразных соединений: от космического вакуума до планет, звезд, галактик и др., в различных состояниях: твердом, жидком, газообразном и т. п. По большому счету, система косной материи – это Вселенная, во всей многообразной структуре.

THE BASIC POSTULATES OF THE UNIVERSAL EVOLUTION MODEL «EVOLVING MATTER»

OLEG BAZALUK – Doctor of Philosophy, Professor,
International Society of Philosophy and Cosmology
(Kyiv, Ukraine)

E-mail:bazaluk@ukr.net

The author reveals the features of construction of the universal evolution model, which he called «Evolving matter». According to the author, the material world, which is perceived in scales of the Earth and near space, consists of visually and empirically easily detectable states of matter, with different complexity of the internal organisation: inert, living and intelligent matter. The

transition from one («parent») state of matter to another («daughter») state is caused by three main factors and two reasons of evolution. The author has carried the following factors of evolution as a complication:

a) Continuity of self-complication structures, types of interaction and environments of existence of any state of matter, which is supplemented by:

– Block of continuous self-complication;

– Principle of block of continuous self-complication of dominance;

b) Nonlinear complication of structure, types of interactions and environments of existence of any state of matter, which is specified by factors:

– Hierarchical nonlinear complication;

– Orientation of nonlinear hierarchical complication;

c) Complication isolation.

The author carries complications to the evolution reasons:

a) Active principle, which is inherently the basis for the initial elements of any state of matter, and which forms a self-complication;

b) Natural selection as the environment influence.

Keywords: inert matter, living matter, intelligent matter, evolution, principle of dominance, nonlinearity, continuity.

Особенности построения универсальной модели эволюции «Эволюционирующая материя»

О. А. Базалук – д. филос. н., проф.,
Международное философско-космологическое общество
(г. Киев, Украина)

Автор раскрывает особенности построения универсальной модели эволюции, которую он назвал «Эволюционирующая материя». По мнению автора, воспринимаемый в масштабах Земли и ближнего космоса материальный мир состоит из трех визуально и эмпирически легко обнаруживаемых состояний материи с различной сложностью внутренней организации: косной, живой и разумной материи. Переход одного («материнского») состояния материи в другое («дочернее») состояние обуславливают три основных фактора и две причины эволюции. К факторам эволюции как усложнения, автор отнёс:

а) непрерывность самоусложнения структуры, типов взаимодействия и сред существования любого состояния материи, которая дополняется:

– блочностью непрерывного самоусложнения;

– принципом доминантности блочного непрерывного самоусложнения;

б) нелинейность усложнения структуры вещества, типов взаимодействия и сред существования любого состояния материи, которая уточняется факторами:

– иерархичности нелинейного усложнения;

– направленностью нелинейного иерархичного усложнения;

в) изоляция усложнения.

К причинам эволюции как усложнения автор относит:а) активное начало, которое изначально заложено в основу исходных элементов любого состояния материи, и которое образует самоусложнение;б) естественный отбор, как влияние внешней среды.

Ключевые слова: косная материя, живая материя, разумная материя, эволюция, принцип доминантности, нелинейность, непрерывность.

The author's research in the area of neurosciences and desire to construct neuroevolution model on their basis provided a substantial assistance in the construction of the universal model «Evolving matter». That is to say tendency to understand features of formation and development of the human mind led the author to consideration of evolution models of inert and living matter which are already in the science.

Working over the universal theory of evolution «Evolving matter» and construction on its basis of the model of the same name, the author took as initial axiomatic truths following assumptions:

The first assumption. According to the author, the material world, which is perceived in scales of the Earth and near space, consists of visually and empirically easily detectable states of matter, with different complexity of the internal organisation:

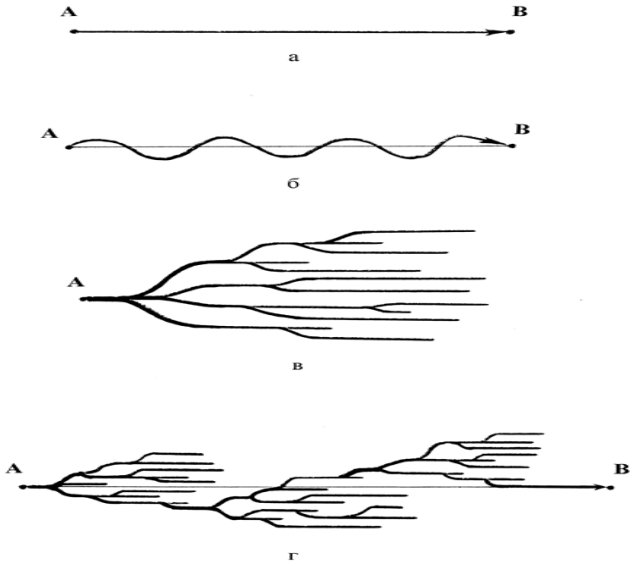
1. Inert matter (in Vernadsky's terminology [*Vernadsky*, 1975; *Vernadsky*, 1977; *Vernadsky*, 1987]) is a certain set of elementary particles which at the expense of fundamental interactions form the material world in all its variety and complexity. Inert matter is inorganic and organic structures, interactions and environments which are formed without participation of living organisms. They are in a special way distributed on the greatest and small observable scales of space, and form *system* of inert matter or *our* Universe.
2. Living matter (the life world, «living substance» in Vernadsky's terminology [*Vernadsky*, 1975; *Vernadsky*, 1977; *Vernadsky*, 1987]) is sets of complex biomolecules, acellular, cellular and multicellular organisms as well as ecosystems which are formed as a result of biogene interaction of environments of existence. Ecosystems create the biosphere or *system* of living matter including an area of life distribution and life activity of products on separate material space objects as well as in space scales.
3. Intelligent matter (in Bazaluk's terminology [*Bazaluk*, 2000; *Bazaluk*, 2005; *Bazaluk*, 2014]) is sets of neural networks of subconsciousness and consciousness which are differing complexity of the internal organization as well as their external displays – artificial products of activity. Set of products of neuroevolution and socio-cultural evolution forms the noosphere. The noosphere or *system* of intelligent matter is an area of distribution of advanced neural networks and products of their creative realization in scales of separate space objects and the Universe.

The author has considered stages of formation and development of each of the three states of matter and built corresponding, operating evolutionary models for many years. Mainly, the author used the Russian-speaking scientific literature and involved the versatile argument for the construction of evolution models of each of the three states of matter. However, the author's work was considerably facilitated by the advanced workings out of the inflationary and synthetic theory of evolution in the construction of evolution models of inert and living matter. But when the author researched the construction of evolution model of intelligent matter (the model of noogenesis), he had to do all work by himself using unsystematized and sometimes inconsistent researches in neuroevolution and sociocultural evolution.

The second. All evolutionary processes and the phenomena in *our* Universe are nonlinear. In the research «The Matrix of planetary systems: visualisation of the terrestrial evolution» [*Vitol*, 2012: p. 45] Russian futurologist Eduard Vitol has graphically represented the development of representations about the evolution.

If the «iron» determinism (see *Figure а*) dominated several centuries ago, eventually nonlinear views began to arise. Initially, researchers have found out that the evolution process does not always correspond to the vector because certain deviations from the direction are discovered (see *Figure б*). And then it was affirmed that the evolution is a branching process (see *Figure в*). As a result of it, many scientists

had theoretical views which completely excluded linearity from the evolution. Moreover, such models as tangled, reticular in which the picture of evolutionary transformations looked even more difficult and tangled began to appear (see *Figure 2*).



Understanding of reticular evolutions in biology was introduced byTheodosius Dobrzhansky, who is one of founders of the synthetic theory of evolution, at the beginning of the twentieth century. Another founder of the synthetic theory Julian Sorell Huxley actively used this concept in his works, significantly expanding and enriching its meaning [*Huxley*, 1971].

From our point of view, the nonlinearity of evolution is even more complex process. Substantially nonlinearity is closer to fractal diatropic network in understanding of the Russian scientists Sergei Meyen and Yury Tchaikovsky [*Tchaikovsky*, 2006]. Evolution is a compound of trial and error, accidents and patterns, progress and regress, order and chaos, vertical and horizontal interactions, catastrophes, symbiosis, parallelism, co-evolution, adaptations, etc.

This is a single fluctuating environment in which there are no restrictions for main objective achievement – the rights to existence. The nonlinearity of evolution has even sacrifice which is adestruction of separate structures for the sake of system preservation. Therefore, in our understanding variety of structures, types of interactions and the existence environments, which are observed in the material world, is a consequence of nonlinearity of evolution, versatility and diversity of its approaches.

The third. The groups of fundamental laws, which have originally laid an active beginning in a basis of any conditions of matter, are at the heart of evolution of our Universe. The matter is a movement. Out of movement, out of the active beginning, the matter does not exist.

When we take the same nuclear, atomic and molecular organization of inert matter, we watch that they are based on the interaction energy. Furthermore, the world-RNA, protocells, cells and multicellular organisms of living matter are formed by the use of both internal and external sources of energy. Also, work of neural networks of subconsciousness and consciousness of intelligent matter (unconscious and

conscious activity) is provided with the reticular formation and other internal and external sources of energy. Therefore, all states of matter in the development of their own structures, types of interaction and existence environments use internal and external sources of energy.

The active beginning which has been laid in a basis of evolution is considered in many works. For example, Henri Bergson, Howard and Eugene Odum, Ronald Fox, Clare Folsom, Alexander Hazen, Sergey Haytuna, Yury Tchaikovsky, Alexander Chizhevskogo, Erwin Schrödinger and others.

The fourth. The evolution process in our Universe is a continuous complication of structure, types of interaction and environments of existence of any state of matter. This feature of evolutionary process was specified by the American geologist James Dwight Dana, who was one of the first, in the middle of the 19th century.

He was the first in academia who pointed to the fact that during geological time is continuously evolving central nervous system of animals, the brain, and sometimes there are geologically long stops, but never reached the level becomes lower [*Vernadsky*, 1987]. His discovery James Dwight Dana called cephalization process.

According to the author, process of continuous complication of structure, types of interaction and existence environments concerns any of three known modern sciences of states of matter. It is caused by the initial activity which has been laid in a basis of evolution as well as a constant competition of material structures and environments for the right of existence in the conditions of the extending Universe.

The fifth. Continuous complication of structure, types of interaction and existence environments is carried out thanks to set of admissible combinations with the initial and subsequent (formed) elements. Otherwise, it is thanks to a block combination, i.e. thanks to the possibility of a various combination with elements of structure of various complexities. Furthermore, new structures, interactions and environments of existence, which are there and then involved in new combinations, are formed during evolution. Combinations, shifts, placings and enumerations of set of discrete elements in structures, interactions and environments of existence of any states of matter lead to variety of material forms and functions which have the single purpose. This purpose is various ways to be fixed in conditions of complex environment continuously and non-linearly.

The idea of education in the science became various in the world at the expense of a combination of certain parts and has long history. It goes back to Empedocles who considered that at first there were various parts of animals, which have then incorporated in various combinations. In 1666, the German mathematician and philosopher Gottfried Wilhelm Leibniz published his work «Dissertation on the combinatorial art» (also known as «Dissertatio de arte combinatoria») which is based on the combinatorial analysis. The block principle of evolution is considered in many researches, especially, which research evolutions of living matter. For example, there are in the works of Sergey Afonkin, Vitaly Kordyum, Yury Tchaikovsky, Alexander Ugolev, etc.

The block principle of evolution is not a proven fact in the science. Furthermore, this principle is generally not considered in modern models of evolution of inert and intelligent matter. But, this principle in the evolution model of living matter competes to idea of symbiosis which had the second breath in the works of the American biologist Lynn Margulis. From our point of view, a misunderstanding is ob-

served in these works because the idea of symbiogenesis is an analogue of block complication, only with functional blocks i.e. more difficult organizations of living matter. The block principle of complication of structure, types of interaction and existence environments is characteristic for any states of matter. Difference is only in structure and functionality of blocks. We think that the single-level organization is characteristic for blocks of inert matter. Furthermore, this organization is formed by integration of elements of structure with various complexities. Moreover, the two-level organization is characteristic for blocks of living matter. This organization is formed by merge of two functional blocks (e.g., molecules and genes) in a single complex- functional block, which can carry out functions of self-replication, self-organization and self-regulation. Further evolution of living matter occurred due to the merger (the same symbiosis) of two-level complex-functional blocks in new organizations. Furthermore, these organizations are involved in the continuous and non-linear block complexity of biological organisms. Also, the three-level organization, which allows actively to transform (design) environmental conditions, is characteristic for blocks of intelligent matter. Accordingly, the evolution of intelligent matter is further complication of the three-level block organizations.

The block principle of evolution visually and empirically is found out:

1. In inert matter. For example, in continuous complication of structure: quarks → elementary particles → nuclei → atoms → molecules.
2. In living matter. For example, biologists have discovered that proteins consist of different domains which carry out different functions. Some «anchor» proteins in membranes, some react with substances-substrata, and others can join the DNA. Different domains can be produced proteins with different properties by combining [*Afonkin*, 2003]. The block structure of the protein corresponds to a mosaic structure of genes. Block structures have chromosomes, genomes, organisms, taxons, ecosystems and even animal behavior.
3. In intelligent matter. For example, the structure of neural networks of subconscious is formed from the «old» blocks (nervous systems and their structures) and new organizations. These organizations have added the structure and, consequently, changed functions of thalamic nuclei, reticular formation, hypothalamus, cortex, etc.

The sixth. We believe that continuous and nonlinear block complication of the structure, types of interactions and environments of existence of any state of matter has its limitations, which are outlined by the regulatory compromise. Block complication is a constant search for the regulatory compromise between urge of any material organization to invariance and integrity. Moreover, there is necessity to correspond to environment conditions. The more complex the organization, the less stable it is: it expends more energy on its content, and it is more exposed to the destructive influence by environmental conditions.

The regulatory compromise is not constant. It is inclined to changes. Variability of regulatory compromise is caused by two reasons: 1) was originally put into the block structure of functional activity, and 2) the accelerating expansion of our universe (which entails the chain of complication of interactions and the environment of existence). None of the components of the regulatory compromise is stable by its nature. Thus, the structure, types of interactions and the environment of existence of any state of matter are naturally doomed to continuous block complication. The mechanism of positive feedback is looked through i.e. *system complication provokes a conflict which is possible only by the way of further complication*.

The seventh. During continuous and nonlinear block complication of structure, types of interactions and environments existence of any state of matter conditions are created on which some combinations are formed easier than others. Performance of the given block combinations suppresses other combinations. This is the principle of dominance, erected in the rank of the universal law. Many scientists researched dominance in the evolution. The idea of dominance plays an important role in molecular biology and biology, (Gregor Mendel, Ronald Fisher, Sewall Wright, John Burdon Sanderson Haldane's researches, etc.), neuroscience (Nikolai Vvedenskii, Aleksei Ukhtomskogo's researches, etc.). In our opinion, the principle of dominance in the block combination is universal in nature. And it is a basis for the evolution of inert, living and intelligent matter.

The eighth. Evolution is a hierarchical process. The hierarchy is a series in which each element is a part of the previous element and simultaneously includes all subsequent elements [*Grodnitsky*, 2002]. In our understanding, the hierarchical evolution, which is observed in our Universe, is a consequence of two mutually exclusive («complementary») processes, the totality of which gives detailed information about them as an integral phenomenon. Bohr's principle of complementarity (BPC) reveals feature of the evolutionary process in any hierarchy of any state of matter. Namely, on the one hand, the environment of existence is formed by «parent» (previous) hierarchy, in every possible way inhibits the continuous and nonlinear block complication of «daughter» organizations. But, on the other hand, thanks to all the same «parent» hierarchy, the «daughter» organizations have every chance to be fixed in the conservative «parent» environment, and to some extent (depending on the importance of changes) affect its organization (structure and functions). Thus, hierarchical evolution of our Universe are mutually exclusive and at the same time, complementary relations between a conservative position of the «parent» organization which keeps the integrity and invariance, and revolutionary messages of continuously becoming complicated «daughter» structures. And, thereby, «parent» system will be on a new level of organization.

The ninth. Hierarchical deployment of our Universe is the directed process. And the evolution of orientation is explained by hierarchy of continuous and nonlinear block complication of structure, types of interaction and environments existence of any state of matter. As each hierarchy means an enclosure of the «daughter» organization in the «parent», an admissibility of possible block combinations (despite seeming infinite variety) is limited. The «parent» organization by moving regulatory compromise imposes restrictions on the continuous and non-linear block complication of the «daughter» organization. Thus, these are dominant (favorable) options for combining. The *orientation* of evolutionary process is formed by the influence of the «parent» hierarchy to the continuous and non-linear block complexity of the structure, interactions and environments existence of «daughter» hierarchy.

The historiography of this issue is researched in Igor Popov's study «Orthogenesis against Darwinism» [*Popov*, 2005].

The tenth. The construction of models of evolution of three states of matter and the evolution of the universal model is somewhat simplified by the discovery clearly visible similarities between models. Similarity of the main parts (blocks) models was observed visually and empirically. Moreover, it contributed to a better understanding of them. It was necessary to pick up only the evidence base, which, unfortunately, is not always corresponded to the declared level and validity criteria. Fur-

thermore, various degrees of development models were discovered by close consideration.

When the author explored «Evolving matter» at the construction of universal model as well as the evolution models of inert, living and intelligent matter, he discovered the following key analogies:

1. *Structures, types of interactions and the existence environment* (field environments) are evolved in each state of matter;
2. Each model of evolution consists of certain number of structures, types of interactions and environments of existence *invariant (constant) in time*. These sets of invariant organizations, which difficult correlated with each other, form hierarchy of systems, which differ from each other complexity of the organization;
3. Each hierarchy of system proves in *functions*. The basic functions are *objectively existing abilities of structure of system to process material, energy and information resources as well as ability to move in space*. Abilities are realized in the structure. They are also rather constant as a result of its relative conservatism;
4. Hierarchical evolution of matter is regulated by a) *universal laws* of interaction, which are the same for all models of evolution, b) *private laws*, which only work within the particular model (state of matter);
5. The hierarchy of evolution can be seen not only in the course of development of particular state of matter, but also in the formation of global states of matter. So, having reached limit of perfection in the organization of structure, types of interaction and the existence environment of «parent» inert state of matter, which naturally transforms into new «daughter» state i.e. living matter. Furthermore, after a certain period of time, living matter becomes «parent» system for the new «daughter» organization i.e. intelligent matter. *«Daughter» state of matter are invariant hierarchies with uncharacteristic for the «parent» state of matter characteristics including structure, types of interaction and existence environments*.
6. Co-evolution of «parent» and «daughter» states of matter on the scale of the Universe leads *to fastening of «daughter» state of matter in certain parts of «parent» condition and formation of continuously developing spheres of influence by it*.

The eleventh. The author has constructed universal model «Evolving matter» on the basis of integration of three models of evolution: inflationary, synthetic and noogenesis. Thus, the author has accepted the inflationary model of the Universe with a few additions; he has significantly changed synthetic model adding alternative ideas and views. Furthermore, the author has constructed the model of noogenesis from scratch. The argument of transitive states of matter had certain difficulties. The author has also solved this problem in many respects by himself. The identified analogies in models have allowed to establish the «weak» and «strong» parties of each model. Furthermore, it has allowed to see errors, delusion and contradictions. At the same time, the identified analogies in the construction of models of evolution have allowed to systematize a huge volume of the interdisciplinary information, to «dissolve» on models and to strengthen their argument.

According to the author, the work on the creation of universal model «Evolving matter» as well as its constituent models of evolution of inert, living and intelligent matter has resulted in the following:

1) detection of analogies in the construction of models of evolution;

2) detection of transitive states of matter providing a natural transition from one state of matter to another;
3) detection of nesting of each following model in the previous model (hierarchy of evolution);
4) establishment of the directed continuous and nonlinear block complication of structure, types of interactions and environments of existence of any state of matter (the principle from simple to complicated);
5) establishment of universal laws of interaction between states of matter, uniting them in the single structure of the Universe.

I would like to notice that many of these results are well-known to science for a long time and as far as possible the author listed discoverers. The novelty of research consists in *ordering* of well-known facts and only future discoveries as well as in the creation *of new methodology*. According to this, the famous Russian evolutionist, paleobotany Sergei Meyen noted that this methodology is «able to control the information explosion, giving guidance in the ocean of knowledge, crystallizing loose masses of private supervision in harmonious theory» [*Meyen*, 2006: p. 116]. Moreover, in his opinion, *the wisdom of science* is in the methodology [*Meyen*, 2006].

The author has tried to show the *new understanding of the world order*, holistic (integral) vision of the main stages of formation and development of our Universe.

In our opinion, the new universal model of evolution with its generators of models of evolution of inert, living and intelligent matter has allowed:

1. To systematize a large and different material of scientific researches in the single universal theory of evolution;
2. To establish contradictions and the open problem fields demanding the elimination and definition in the further researches of evolutionary process;
3. To create the model which conceptually discovers features of expansion of space vacuum in neural network and further, in more complex structures of matter;
4. To highlight a role, a place and a degree of influence of each state of matter in cosmic processes and phenomena;
5. To show complex structure of space and patterns of processes which take place in it.

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