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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

**PHILOSOPHICAL AND METHODOLOGICAL ANALYSIS OF
THE ELEMENTARY PRINCIPLES OF LIFE IN THE
BIOLOGICAL KNOWLEDGE**

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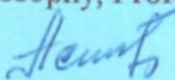
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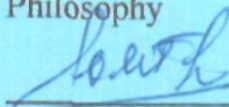
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GENERAL DESCRIPTION OF THE DISSERTATION

The relevance of the research topic. President of Azerbaijan Ilham Aliyev defined the main directions of the development of Azerbaijani science. Speaking at the Shemakha Astrophysical Observatory, the President noted that “Practical measures are being taken to develop Azerbaijani science ... Currently we are carrying out serious activities in traditional as well as new areas of science.”¹ The complex nature of the development of current scientific problems requires comprehensive integration of social and natural sciences. The degree of effectiveness of modern scientific developments, both theoretical and experimental, largely depends on the degree of integration development. Nevertheless, the development of modern scientific directions is not an automatic process, which requires focused, purposeful efforts and, in particular, the development of a certain set of provisions of an interdisciplinary methodology. The accomplishment of this significant task must be based on a multidimensional and comprehensive approach. Such a systematic approach should be based on various studies in the field of philosophy, logic on the methodological principles of the development of knowledge, philosophical developments of modern natural science, and especially biology.

“Modern biology has moved to the forefront of all natural science, becoming one of the leaders of science in the 21st century. This circumstance was especially emphasized by the Nobel laureate, academician V. L. Ginzburg”²: “Biology itself, especially today, molecular biology, has taken the leading place in science.” Therefore, first of all, “... biological and near-biological topics should and will occupy... an ever-increasing place. We need to understand and

¹ Речь Президента Азербайджанской Республики Ильхама Алиева в Шамахинской астрофизической обсерватории 16 мая 2013 года. <http://salamnews.org/ru/news/read/75225/ilxam-aliev-azerbaydan-dolen-prevratitsya-v-nauchniy-centr-regiona/>

² Мамзин А. С. Редукция, Интеграция, Эволюционизм в современной биологии//Вопросы философии. М., 2013, №8. – 94с

actively promote this. Secondly, the question of reductionism is both a great physical and biological problem, and I am convinced that it will be one of the central problems in science of the 21st century. "³

The identification and definition of fundamental, elementary concepts in theoretical knowledge systems is considered to be one of the most important problems of biological cognition that have fundamental philosophical significance. Elementary objects are the initial representations of theoretical systems of knowledge, as the entire programmatic activity of theories is built on their basis, and the features of the scientific style of thinking are revealed by the help of them. The concept of elementary character is one of the essential classical problems of modern science and philosophy. Elementary objects act as main representations of theories, establish simple structural connections, and in this sense they are elementary. Currently, the unquenchable interest in this problem is determined, first of all, by its fundamental nature, program-cognitive peculiarity, integral aspect and the significance of this concept for modern biology, modern methodology and philosophical understanding of the surrounding in general.

The features of the logical structure of biological knowledge and, above all, the dynamic nature of biosystems indicate that the concept of processes as the elementary foundations of life in biology should be based on the analysis of continuous relationships. Biological structures are considered from the point of view of evolution, and the processes occurring in them testify the dynamic nature of biological relations. At the same time, the traditional perception of the elementary as the simplest rigid indecomposable objects is losing its significance in the analysis of biosystems. The biological whole is not its constituent atomic-molecular parts, provided that they are not biological. Such a program underlies the

³ Гинзбург В. Л. Какие проблемы в физике и астрофизике представляются наиболее важными и интересными//Успехи физических наук 1999. - №4. – 436с. ; Кемеров В. Е. Ключи к современности – в сдвигах методологии// Вопросы философии, М., 2014, №2, с 3-13.

biological type of thinking. This relativization of the biological style of thinking itself contributes to the relativization of elementary concepts in theory, the interpretation of which is associated with a new procedural approach. This transition from the "language of objects" and "things" to the "language of processes" and "states" in biology is of major methodological significance for understanding the modern formulation of the question of elementary knowledge in cognition.

For the analysis of the essence and role of the procedural approach with its correlation to the elementary foundations of vital systems, it is fundamentally important that the basic properties and parameters in biological systems are considered in the language of events and processes. The procedural approach focuses on the systemic identification of the elementary foundations of life in biological structures and on a holistic representation of the studied reality, thereby identifying and representing material analysis at the level of formation and development. In this dissertation, an attempt is made to consider the methodological significance of this fact within the framework of the elementary foundations of biological organizations.

The degree of the elaboration of the problem. In the philosophical literature, the elementary foundations of life have recently been analyzed in various aspects, not only in relation with the study of the main issues of biological knowledge, but also in the relation with the development of philosophical and methodological problems of science, philosophical issues of modern natural science, the solution of logical and methodological issues in the development of scientific - theoretical systems, etc. In this regard, in the first place, ones can be named are I. A. Akchurin, A. D. Aleksandrov, V. I. Arshinov, L.B. Bazhenov, V. S. Barashenkov, V. S. Gott, P. S. Dyshlev, A. S. Kravets, B. G. Kuznetsov, M. A. Kissel, I. V. Kuznetsova, B. M. Kedrova, E. A. Mamchur, M. A. Markova, A. M. Mostepanenko, M. E. Omelyanovsky, B. Y. Pakhomov, G. I. Ruzavin, N. I. Stepanova, U. V. Sachkov, V. S. Stepina, I. N. Smirnova, A. D. Ursula, A. I. Uemova.

A significant place is given to the concept of an elementary object in the works of the classics of modern natural science: N. Bohr, L. de Broglie, M. Born, W. Heisenberg, P. Dirac, V. Pauli, Cecil F. Powell, M. Planck, Shoichi Sakati, R. Feiman, E. Schrödinger, A. Einstein.

It is especially necessary to note the work in the development of methodological issues of biological knowledge, as well as research concerning the elementary foundations of life by P. K. Anokhin, A. Batko, N. I. Vavilov, M. F. Vedenov, V. I. Vernadsky, N. N. Vorontsov, N. P. Depenchuk, I. S. Dobronravova, N. P. Dubinin, I. B. Zbarsky, F. Kamensky, A. S. Kardashev, R. S. Karpinskaya, F. Kitovsky, I. K. Liseeva, A. S. Mamzina, A. Markov, N. V. Timofeeva-Ressovsky, I. T. Frolov, Yu. V. Tchaikovsky, S. S. Chetverikov, I. I. Shmalgauzen, V. A. Engelhardt, G. A. Yugaya.

In addition, foreign scientists contributed to the solution of this philosophical problem: D. Bottger, L. Wittgenstein, F. Jabr, R. Carnap, S. Lerman, J. Musil, I. Prigogine, B. Russell, G. Stinks, A. N. Whitehead.

It should be noted that the philosophical analysis of the elementary foundations of life in biological knowledge is not considered in the republican works. At the same time, the works of Abbasov A. S., Abbasov A. F., Aliev S. A., Bashirov R. I., Gasanov R. A., Gakhramanov N. F., Gurbanov F. M., Ismailov V. I., Mamedov A. B., Tagiev A., Khalilov S.S.⁴ are very close to the given issue.

⁴ Аббасов А.Ф. Сложность. Время. Синергетика: Общетеоретический анализ сложности и развития сложных систем. Баку: Эльм. 1991, 212 с.; Аббасова А.С. Проблемы истории, теории и методологии познания. Баку: Ени Насил, 2001, 284с.; Qurbanov F. M. Elmdə sinergetik yanaşma. Bakı: Elm, 2005.-364; Qəhrəmanov N.F. Məmmədov Ə. B., İsmailov V. İ. Təbii elm biliyın fəlsəfi əsasları, Bakı: Elm, 2014.-584s.; Мамедов А. Б. Баширов Р. И. Концептуальный подход к современному естествознанию. М. Альфа, 2006, 296с.; Тағйев А. Müassir təbiyyatşunaslığın konsepsiyaları: Bakı: Azərənəşr, 2011-480s.; Халилов С. С. Основание научно-технического прогресса. Логико-методологический анализ, М.: Экономика и информатика, 1997, 144с.

In our work, when considering the elementary foundations of life in biological knowledge, we base on the fact that its constructive solution is mainly interconnected with the analysis of the main theoretical positions and representations of scientific theoretical systems of modern knowledge, and mainly biological. The development of biological knowledge has a decisive influence on the development of our general ideas about primary elementary structures, based mainly on the concept of atomism.⁵

The most important aspect of it was the development of ideas about the elementary process. The connection of the "language of processes" with the concept of elementary character, especially in relation to biological cognition, remains unrevealed. From our point of view, it is this position that is associated with methodological difficulties in describing and understanding the most informational, complexly developing vital objects, which they try to describe from the point of view of classical, mechanical ideas about the elementary character and complexity. The concept of universal interconnection in the development of the material world is increasingly being established in modern scientific thinking.⁶ The latter means the

⁵ См., например, Марков М. А. О понятии первоматерии // Вопросы философии. – 1970 - №4, С. 66-75; его же. О природе материи. – М.: Наука, 1976 -216с; Кедров Б. М. Три аспекта атомистики. – М.: Наука т.1 – 294с; т.2 – 317с; т.3 – 307с, 1969 – Т I-III; Диалектика в науках о природе и человеке. Эволюция материи и ее структурные уровни. Труды III Всесоюзного совещания по философским проблемам современного естествознания. – М.: Наука, 1983, т. 2, 413с; Принцип элементарности и понятие элементарности // Методологические принципы физики. – М.: Наука, 1975, С 477-505, Степанов Н. И. Концепция элементарности в научном познании – М.: Наука, 1976 – 173с; Баженов Л. Б., Кремьянский В. И., Степанов Н. И. Эволюция материи и ее структурные уровни// Вопросы философии.- 1980.-№2, С 91-100; Баженов Л. Б. Общий статус редукционизма – Пущино, 1986-25с.

⁶ См., Пригожин И., Стенгерс И. Порядок из хаоса: Новый диалог человека с природой. – М.: Прогресс, 1986 - 432с; их же Пригожин И., Стенгерс И. Время, хаос, квант. – М.: Прогресс, 1994. – 266с; Уайтхед

formation of a new procedural context of the concept of elementary character. In this regard, the world is viewed not as something frozen in space and time, but as a developing process.⁷

Elementary events and elementary processes in this regard assume the status of primary objects of cognition. For the cognition of biosystems, the procedural vision in the methodological plan helps to identify the causal relationship of all levels of a part of the biosystem as a whole, thereby reflecting the integrity of the system, development. Although a number of researchers' works reflect this problem, it was not considered in an integral aspect, in which it would reveal the methodological significance of a procedural approach to understanding the elementary foundations of life in biological knowledge.

Object and subject of research. The object of research of this thesis is the development of ideas about the elementary components of biological systems. The subject of the research is the change in our general ideas about the primary foundations of life in biological

А. Н. Избранные работы по философии – М.: Прогресс, 1990 – 718с;

⁷ См., Маркс К., Энгельс Ф. Соч. – Т.20, С 46-52, 530, 360; т.21 – С.302, 303; Проблема взаимосвязи организации и эволюции в биологии. – М.: Наука, 1978 – 295с. Шелепин Л. А. О некоторых особенностях взаимосвязи процессов и явлений// Теория познания и современная физика. – М.: Наука, 1984. – С.320-334; Корюкин В. И. Идея всеобщей взаимосвязи в научном мышлении XIX-XX вв и принцип дополнительности // Принцип дополнительности и материалистическая диалектика – М.: Наука 1976, С 44-57; Карпинская Р. С. Редукционизм и понятие элементарного биологического акта // Философские проблемы биологии. М., 1973.- С143-151; Марков А. Рождение сложности. Эволюционная биология сегодня: неожиданные открытия и новые вопросы. – М.: Астрель, 2010. – 527; Мамзин А. С. Редукция, интеграция, эволюционизм в современной биологии // Вопросы философии -№8, 2013 – С93-104; Степин В. С. Саморазвивающиеся системы и постклассическая рациональность // Вопросы философии. – 2003.-№8; Аршинов В. И. Синергетика конвергирует со сложностью // Вопросы философии. – 2011-№4, С73-83.

knowledge.

Goals and objectives of the study. The main goal of the thesis is to provide a comprehensive analysis of the concepts of the elementary foundations of life in the system of biological cognition, in their correlation with the significance of the interrelated concepts of an elementary object and an elementary event. In the system of modern biological theories, the simplest elementary concepts are interpreted in the language of events and processes. At the same time, individual events are not important themselves. A biological object is presented as a dynamic complexity of events, their integrative set as something whole. Regularities of all kinds are built on the basis of the regularity of these events.

The candidate for a degree set himself the following tasks:

- on the basis of certain scientific material, identify the methodological role of the concept of the elementary foundations of life in biological knowledge;

- analyze the types and functions of primary objects of vital activity in the structure of biological knowledge;

- show the development of ideas about the elementary foundations of life in biology;

- consider the interpretation of the concepts of an elementary object and elementary events, processes in the structure of life systems and on this basis determine:

- the significance of the category of the event and the process for biological cognition;

- show an indicator of the progress of the idea of elementary character as a process;

- to reveal the significance of the concept of elementary character for modern methodology and all theoretical knowledge;

- and, finally, to analyze the peculiarities of the procedural aspect of elementary character in order to show all sorts of perspectives for further analysis in the information aspect of complexly developing systems.

Main research results and their scientific novelty.

The dissertation shows and analyzes a number of issues related

to the structure and function of the concept of elementary character in biological knowledge.

The scientific novelty of the research which is submitted to the defense is the following:

1. Based on the analysis of scientific research, the content of the concept of elementary character is revealed thoroughly as well as its system-forming role in relation to biological knowledge. It is shown that elementary objects are the initial representations of theoretical knowledge systems, the content and scientific-program activities of which are determined by the images of these representations.

2. The significance of the procedural aspect of the concept of elementary character in cognition, in informational terms, complex biological systems and their functioning laws are methodologically substantiated and shown in the thesis.

3. The analysis of the influence of the provision on the unity of the world on the formation of general ideas about elementary character is given in the work. The relationship between the concepts of complexity and indivisibility in biological processes is also revealed in the thesis. Their relationship with the concepts of the elementary character and complexity, constancy and variability is revealed in the dissertation, and it is affirmed that in biological systems these opposite properties are combined in unity. In identifying the dialectics of the elementary character and the complexity, the following fact acquired a fundamental significance: elementary character converges with complexity.

4. The new, procedural aspect of elementary character, which is being formed in modern biology, is analyzed thoroughly in the work. As a result, it has been proved that modern biology requires a rethinking of traditional ideas about an elementary structural unit, to essentially new forms that synthesize in themselves the structural and functional aspects of biological complex, in terms of information, rich systems. This analysis was carried out taking into account the peculiarities of the modern development of science, especially in biological knowledge. In this regard, a philosophical interpretation of

the procedural approach to the elementary foundations of vital biological systems is substantiated in the dissertation.

5. It was revealed that the methodological significance of elementary ideas about the foundations of vital systems is most fully revealed within the framework of the concepts of an elementary event and an elementary process. From this point of view, the author analyzes the advantage of the "language of events" and "language of processes", which have entered the practice of scientific knowledge to reflect the idea of formation, change, development and continuously developing environments and relationships. The fundamental and epistemological status of the "language of events" and "language of processes", reflecting the developing biological entities in reality, is revealed in the work.

6. The methodological "turn" concerning the process of understanding biological structural organizations has been substantiated and disclosed in the work. The meaning of such a "turn" is reduced to the formulation and discussion of a new "language of processes" in which the studied reality is formulated. In this regard, a point of growth of the elementary status of vital activity as a process has been identified in the thesis.

7. On the basis of the above results, the concept about the integrity, consistency, as well as the interdisciplinary significance of the procedural approach in scientific thinking are put forward here. This provision is of great importance for the analysis and solution of methodological problems concerning the integrative aspects of scientific knowledge. If necessary a holistic approach to the interpretation of complexly developing objects in modern science should be taken into account. It is shown that it is on the basis of elementary concepts that various kinds of abstractions, theoretical models and representations in natural scientific knowledge are constructed.

Methodological foundations of the dissertation.

The theoretical and methodological foundations of the dissertation are the ideas provided in the theoretical studies of scientists, as well as in the works concerning the philosophical issues

of modern natural science. In this dissertation, extensive material has been used concerning the methodological problems of both scientific and biological knowledge. Also, the most important publications of biologists, foreign researchers on the philosophical problems of modern scientific knowledge are used here, a critical analysis of their work is carried out in the interpretation of key problems in the development of science and modern Western philosophy.

Scientific and practical significance of the dissertation.

This dissertation is the result of a theoretical study that reveals the methodological role of the concept of elementary character in relation to the basis of life in biological knowledge, as a factor of integration and unity. In the work, a new procedural approach to the study of the problem is revealed - the study of the procedural context of the concept of elementary character. It is shown that the procedural approach most deeply reveals the dialectics of the elementary character and complexity in natural science, deepens our understanding in philosophy of the dialectical concept as a general doctrine of change and development.

The results of this work can be used in the future to develop general scientific interdisciplinary research methods. The data obtained can also be applied in the field of various technologies, as well as in the process of interpreting scientific knowledge. It will also be possible to use the results of the dissertation in pedagogical activities in higher educational institutions in the process of teaching philosophy, when giving lectures, in conducting seminars, special courses, on the methodology of science and philosophical problems of natural science, writing textbooks, as well as in lecture propaganda work, etc.

Approbation of work.

The thesis was discussed at the Department of Philosophy of Baku State University and recommended for defense.

The main provisions, conclusions and recommendations set out in the dissertation were reported at a meeting of the Department of Philosophy of Baku State University.

The main provisions, results, conclusions and proposals

contained in the dissertation were presented by the author at the following conferences:

-At the republican scientific-practical conference of young researchers: "The methodological meaning of the concept of elementary objects and rhythm in biological knowledge" (Baku, 2013);

-At the international scientific and practical conference: "Philosophical and procedural aspect of the knowledge of biological processes" (Prague, 2013);

-At the scientific-practical conference: "General approaches to life processes in biological knowledge" (Baku, 2013);

-At the republican scientific-practical conference of young researchers: "Procedural management of elementary biological structures" (Baku, 2014);

-At the VIII international scientific conference: "Philosophical understanding of the concept of elementary objects in the system of biological structures" (Baku, 2014);

-At the international scientific conference: "Methodological analysis of the attributes of life (hierarchy of structures and integrative processes)" (Prague, 2014);

-At the VII international scientific and practical conference: "Methodological turn in the knowledge of the basics of life" (Yekaterinburg, 2015);

-At the IX International Conference of Doctoral Students and Young Researchers: "Fundamentals of Life and the Status of Elementary" (Baku, 2015);

-At the republican scientific-practical conference of young researchers: "Methodological turn in the understanding of elementary biological structures" (Baku, 2015);

The total volume of the dissertation with the indication of the volume of the structural units of the dissertation: The dissertation consists of an introduction, three chapters, a conclusion, a list of references. The introductory part of the dissertation consists of 11 pages, the first chapter 26 pages, the second chapter 46 pages, the

third chapter 47 pages, the final part 11 pages, the literature part 6 pages. The dissertation consists of 157 pages and 235 680 characters.

THE MAIN CONTENT OF THE DISSERTATION

The introduction substantiates the relevance of the selected topic, characterizes the degree of its development. The goal and objectives of the research are formed, the degree of its novelty and the practical significance of the work are revealed, the theoretical and methodological foundations of the research are determined.

The first chapter of the dissertation "The concept of elementary objects as a subject of philosophical analysis" consists of two sections.

The first paragraph - "General ideas about elementary objects" - gives a general description of the issues that arise as a result of philosophical understanding of the elementary foundations of life in biological knowledge. It is emphasized that the concepts of elementary objects in theories contribute to the awareness of the structural levels of matter and its nature, have an ideological function and determine the methodology for studying developing knowledge in search of fundamental laws of nature, and reveal the relative limit of our knowledge of the studied reality. Elementary objects of theories are indecomposable components of the system under study, act as point representations of theories, establish the simplest structural connections and, in this sense, they are elementary. As an element of the system, they play an integrating role in realizing the integrity of the relationship in the system.

Elementary objects show the quality of the system and the integrity of its structure. There are no absolute structures and absolutely elementary objects. The developmental system represents the unity of elements and structure. It is important for us to note that material objects, their properties and relationships are interconnected and inseparable in reality itself. In complex biological systems, the issues of interactions and relationships between levels are of great

importance.⁸ Therefore, there is every reason to assert the essential relationship between the elements and the system, about the elementary foundations of the system, and at the same time about the relativization between the relationships between the elements and the system. The above was intended to clarify that the elementary objects of theories do not exist independently, but accumulate in themselves the qualitative features of the system under study. An elementary object acts as a component of the system, shows the limit of its divisibility. At the same time, a rather low level of organization of matter, or otherwise, an elementary object of the system acts in relation to the system in a different capacity, cutting off its metaphysicality, demonstrates a focus on development in the interests of the integrity and integrality of the system.

The traditional concepts of the elementary as the simplest "rigid" and indivisible objects are losing their significance in biological structures. The analysis of biological systems is mainly based on the consideration of certain events and systems of processes. Elementary phenomena, events, relationships and processes act as an initial, primary object and as some aspect of the system. Hence there is necessity to consider the concept of elementary character in a procedural aspect.

Naturally, biological organizations are the starting point of this consideration. The second paragraph is devoted to this issue - "The procedural aspect of elementary character in biological knowledge". The procedural approach to elementary character is based on the concept of formation and opportunity, it allows you to look at the world in a new way as an unfolding process, as the realization of various possibilities. The dissertation reveals the peculiarity of the procedural vision, which contributes to the understanding of the process of self-regulation and self-organization in biological systems as a continuous process. No approaches are capable of taking responsibility for understanding the ongoing biological events. At the same time, the concept of an elementary process allows us to

⁸ Сачков Ю. В. Эволюция учения о причинности// Спонтанности и детерминизм – М.: Наука 2006. – с.37.

consider the structure of the process of movement, defining movement in biology as a certain system of events.

The continuous-procedural vision of the organism denies in its essence the "material" "object" representations in the analysis and awareness of the processes of functioning of the vital activity of the system. A meaningful analysis of biological systems suggests that the procedural vision of the elementary foundations of life, along with the dynamics of processes, assimilates the structural features of biological realities. In this regard, the methodological analysis is dictated by the problems of biological cognition. This kind of dialectical relationship, interdependence with the methodology of cognition is determined by the importance of elementary concepts for modern methodology. This provision has tremendous methodological significance, which is fully reflected in the dissertation.

The second chapter of the dissertation "Elementary material processes as the basis of life" consists of three sections.

The first paragraph - "Evolution and dialectic nature of the elementary foundations of life" analyzes the essence and content of the process of evolution and its dialectical nature. It is pointed out that in the process of biological evolution, the fact of awareness of its statistical laws is important. The statistical nature of the laws of evolution on the elements of the relationship between the categories of chance and necessity, uncertainty and certainty, shows the limitations of mechanical determinism. It is argued that nothing in biology makes sense unless viewed in the light of evolution.

The problem of philosophical understanding of the dialectic nature of biological systems and the principles of life is the most important one of our time. In solving this problem, the formation of a dialectical worldview plays an important role in biology. In this regard, the dissertation examines the problem of establishing dialectical transitions from simple to complex and from complex to simple in the process of cognition. In this aspect, integratism, as a path from simple to complex in cognizing the phenomena of life, is inextricably linked with reductionism - the process of the reverse development of bioprocesses towards their simplification.

The integrity of a biosystem is based on the relationship of events and the occurrence of their feedbacks (reciprocal, mutual direction) on interactions, interdependence and complementarity, which in turn form the basis of all self-regulation mechanisms and determine the information content of the biosystem. To comprehend the processes of life and self-regulation, it is necessary to know that in such systems an important role is played not by the information content of the structure itself, but by its interaction with the elementary events of the system. These events themselves are of a point nature and have no components. The fundamental point here is that biological conclusions are mainly based not on the results of events, but on their certain regularities. The results of single interactions are not uniquely determined, but are characterized by a degree of probability. A series of interactions of this kind lead to statistics that is characterized by the probability distribution of such interactions. The presence of certain regularities and orders in elementary events is the basis of the process of self-regulation and orderliness in biological systems.

The second paragraph "From chaos to order and biological reality" examines the conditions for the formation of material carriers of life from molecules of inanimate nature. The structural features of biosystems are revealed, the pre-evolutionary transition from chaos to vital systems is considered. Methodologically, it is substantiated that an orderly transition from tiny lumps of matter to complex living organizations occurs as a result of the process of self-organization, which is based on informative and regulatory changes in the system. It is concluded that the main attributes of a living thing are the ability to accumulate acquired energy from the outside and the system's desire to change, to a new one (mutational properties).

In the future, in the light of these considerations, all kinds of changes and formation of processes at the cellular level are analyzed in the work. On the basis of this, in the methodological terms, it is necessary to emphasize the importance of the principle of constancy

of informative and regulatory processes of cell activity⁹ as a special principle of cell life. It is emphasized that the fact of dependence and interconnection of all elementary events in the cell determine the constancy of informative-regulatory factors and thereby ensure the development and functioning of the cellular system as the basis of biological structures: **JR = const.** J -informative properties of the system, R-regulatory features of the system. Big attention is paid to the analysis of these issues in this section of the dissertation.

Summarizing all of the above in this paragraph, the candidate for the degree comes to the conclusion that single elementary material events express the act of manifestation of a certain material essence in space and time, which takes place in some realities. The physical process, which carries information, a signal, the nature of its material connection, expresses the spatio-temporal properties of events. Any informative changes in the system entail a change in its regulatory framework, and changes in regulatory principles lead to a change in the information properties of the system. Hence, it is clear that the basis of all cellular changes, its processes, properties are indecomposable informative-regulatory processes, the principle of constancy of which determines all the functions of biological systems and, in general, all the characteristic features of biosystems.

In the third paragraph, "Biological rhythms as elementary foundations of life", the candidate, relying on the results of the previous consideration, analyzes the methodological significance of biological rhythms in the development and existence of vital systems. It is argued that the most important task of biological cognition is to reveal the activity of biological reflection and its

⁹ Беркинблит М. Б., Глоголева Е. Г. Электричество в живых организмах. - М.:Наука, 1988, с.48-77; Боттджер Д. Ранняя эволюция животных// ВМН, 2005.- N4. - с.22-28; Гэри Стикс Живое наследие Дарвина//ВМН, N4. - 2009, с 12-19;Is Evolutionary Biology Strategic?//Thomas R. Menger in Evolution. -Vol.61, N1.-p. 239-244, January 31, 2007.

rhythms, which express the temporal aspect of the activity of the biosystem. Biological rhythms show the temporal aspect of biological reflection. At the same time, biological characteristics and their functional nature are associated with the procedural context of cognition, since vital systems are presented as a certain set of combinations of biological processes. At the same time, the process of reflection of biorhythms in the structure of a biosystem is revealed as some universal property of the physical world.

Biological rhythms organize time, and they represent it not as a certain segment, but as a completely consistent connection of events controlled by the rhythm. In this sense, the rhythm represents all the moments of the developmental process. As an integral phenomenon, it stabilizes the dynamics of the stability of the biological organization. This connection between biological rhythm and organization demonstrates the unified nature of the functioning of the system. Violation of rhythms leads to a violation of the laws of development of the system, its regulatory foundations. Thus, the fundamental basis of rhythmic processes is evident in self-organizing systems, which in turn depend on the organizational capabilities of the system of its structure. Biorhythms are responsible for the organizational basis, systems, link the activity of reflection, provide an essential basis for self-organization.¹⁰

The consideration undertaken in the paragraph allows us to conclude that biorhythms are a manifestation of the vital activity of the system. It is biorhythms that are responsible for the activity of reflection and the functioning of the self-organization process. Consequently, the vital activity of the organism is the rhythm of oscillatory processes. From a methodological point of view, the

¹⁰ Марков А. Рождение сложности. Эволюционная биология сегодня: Неожиданные открытия и новые вопросы. - М.: Астрель 2010.-527 с; Is Evolutionary Biology Strategic? Thomas R. Megner in *Evolution*, Vol. 61, N1, pages 239-244, January 31, 2007; Гери Стикс. Живое наследие Дарвина//ВМН, N 4, 2009, с.12-19; The seven sins of Evolutionary Psychology. Jaak pansepp and Jules B. Panksepp in *Evolution and Geynition*. Vol.6, N2, pages 108-131, 2010.

process of self-organization represents a certain limitation, the subordination of balance and stability, the functions on which the rhythmic processes of the system depend. The interrelation of the process of self-organization of a system with oscillatory processes determines the importance of rhythm for the structural organization of biological systems.

The third chapter - "Philosophical comprehension of the dialectic nature of elementary biological structures" consists of four sections.

In the first paragraph - "Dialectics of elementary character and integral biological structures", the main attention is paid to the theoretical understanding of the problem of the relationship between the elementary and the integrity of biological organizations.

The dialectical nature of biological organizations makes its significant changes in our general understanding of the relationship between structure and element. Biological systems are a special way of existence of a complexly organized material structure, which is in constant formation, development, change and self-reproduction. It is capable to respond to irritation and exhibit a number of functions. The main condition for biological organization is the constancy and regulation of all kinds of elementary events in systems and the closest interconnection of various kinds of processes. In this part of the thesis, it is shown that the basis of such biological processes is formed by chemical, molecular mechanisms. It is emphasized that the difference between the existing reality and what happens to it disappears at the cellular level of the organization of matter.

In the conclusion of the paragraph, the candidate for the degree notes that the cell as an elementary structural unit of life is a single and at the same time integral formation in which its constituent elementary foundations are interconnected and interact. A holistic definition of the foundations of the vital activity of the cellular system is of the most important theoretical significance for biology, of enormous methodological and ideological importance, and determines the biological picture of the world. This image is being developed based on data from physical and chemical sciences. The

connection with the physicochemical picture of the world determines the philosophical and methodological significance of physics and chemistry for the entire biological theory of knowledge.

In the second paragraph - "Philosophical understanding of the complexity and indivisibility of biological processes" the candidate analyzes the position of the indissoluble complexity of elementary biological organizations and, in this regard, examines the totality of ideas about evolution, shows the complex of ways of the evolutionary process. "Nothing in biology makes sense as in the light of evolution."¹¹

This paragraph shows that the categories of a part and a whole in biological self-regulatory systems have completely new characteristics. Here the concept of the whole loses its mechanical significance and acquires a systemic quality. The part inside the system and outside it is characterized by different properties. The part isolated from the biosystem often loses its significance. The whole is characterized by systemic properties, systemic integrity. Biological systems are based on a new understanding of objects as processes of interaction or otherwise as a self-regulating process. There is a need for more generalized forms of expression of the concept of integrity and, at the same time, for its methodological comprehension.

The traditional, purely mechanical representation is a thing as something primary, and interaction is the effect of one object on another is replaced in biosystems, as it seems unsatisfactory. Biological reality arises only in the process of interaction. "A thing - a system appears as a process of constant exchange of matter, energy and information with the external environment, as a kind of invariant in varying interactions with the environment. And the complication

¹¹ American Biology Teacher 1973, V.35, p.125-129. [http://en.Wikipedia.org/Wiki/Nothing in Biology makes sense except in the Light of Evolution](http://en.Wikipedia.org/Wiki/Nothing_in_Biology_makes_sense_except_in_the_Light_of_Evolution); Марков А. Рождение сложности. Эволюционная биология сегодня: Неожиданные открытия и новые вопросы. - М.: Астрель, 2010. -527с.; Мамзин А. С. Редукция, интеграция, эволюционизм в современной биологии// Вопросы философии N8, 2013. -с.93-104.

of the system in the course of development, associated with the emergence of new levels of organization, acts as a change from one invariant to another, as a process transition from one type of self-organization to another. The process character of an object (system) is manifested here in two aspects: both as self-regulation and as self-development "¹²

In conclusion of the paragraph, it is noted that, on the whole, a biological cell is a minimal integral information complex with the corresponding centers of energy generation and ways of transporting substances inherent in it. It is argued that the fact that the complex biological cannot be reduced to the sum of its constituent parts is associated not only with the systemic quality of the biological, but also with the defining feature of biological reality - as an indecomposable information-dynamic complex of events. Such a program is a necessary, integral part of biological knowledge. The fact of indivisibility, integrity and, at the same time, complexity in a biosystem once again confirms the procedural peculiarity of protein structures, the decomposition of which is associated with the loss of the regulatory foundations of the biological process.

In the third paragraph - "Philosophical interpretation of the procedural approach to elementary reality" - the main attention is paid to the problem of philosophical substantiation of the fundamental nature of the theoretical status of the concept of process in scientific knowledge.

The limited metaphysical understanding of the world was unable to interpret the latest advances in science. It was necessary to realize that "nature does not simply exist, but is in the process of becoming and disappearing ..." ¹³

New procedural thinking in theoretical knowledge systems

¹² Степин В. С. Саморазвивающиеся системы и постклассическая рациональность // Вопросы философии, N8, 2006. -с.8; Аршинов В. И., Буданов В. Г. Роль синергетики в формировании новой картины мира// Вызов познанию: Стратегия развития науки в современном мире. - М.: Наука, 2004. -с.374-375.

¹³ Маркс К. Энгельс Ф. Соч. 2 издание. Т.-20. -с351

reveals the unity, integrity of relations and phenomena in nature. Thus, nature is presented not as something complete in space and time, but as an unfolding process.¹⁴

Great attention in the philosophical literature is paid to the procedural vision of reality by B. Russell. From his point of view, "... we have two different cases of identity of the structure of groups of objects: in one case, the structural units are material objects, and in the other - events".¹⁵ At the same time, Russell asserts that "Matter is only a certain way of grouping events; therefore, where there are events, there is also matter." ¹⁶ Russell does not abandon the concept of matter, he simply takes a dual position. At the same time, in his research, there is a new understanding of the realities of modern science. Therefore, assessing his position on the need for a continuous vision of reality, one must be objective, since his point of view is diametrically different from the views of such neopositivists as L. Wittgenstein.

Often, from a pragmatic point of view, the statements of R. Carnap can be noted. He believes that in reality it is not things that are presented, but a language that, while cognizing, can be chosen arbitrarily. "To accept the world of things means only to take a certain form of language ..." ¹⁷ His pragmatic point of view leads to the assertion that the scientific language is formal and the issues of its choice are interpreted or practically as a convenient way of expressing knowledge. This interpretation of the language of science from the side of positivism is unsatisfactory. Expressing a critical attitude to positivism, we note that positivism consists not in the use in science of a continuous view of the reality of the "language of events" and "the language of processes", but in its definite interpretation. Since it was the representatives of logical positivism who paid attention to the philosophical analysis of language and the problem of the relationship between two worlds: the "world of

¹⁴ Там же с.46-52, 530, 360

¹⁵ Рассел Б. Человеческое познание. – М.: ИП, 1957. -497с

¹⁶ Рассел Б. Человеческое познание – М.: ИП., 1997-с.196

¹⁷ Карнап Р. Значение и необходимость. – М.: 1959 – с.302

things” and the “world of processes”.

The procedural vision of reality finds resonance in the work of the English philosopher Whitehead.¹⁸ For him, the existing reality is a "stream of events", and concretely separate "actual entities" (actual entities) constitute the real world. These real entities are postulated as "events".

Regardless of the shortcomings of Whitehead's philosophy of dialectical idealism, all his activity testifies to the fact that in an ever-changing world one must think differently - from the point of view of becoming and change. This is the value of Whitehead's procedural vision of reality. Acquaintance with the main philosophical positions of Whitehead testifies that we are dealing with a dialectical approach in the development of thought. Moreover, it is necessary that in biological cognition, along with the "language of processes", the "language of objects" is also used. However, the development of modern scientific knowledge, in particular biological knowledge, has raised the question of the relationship between the "language of objects" and the "language of processes". The assertion of the fundamental nature of the status of the procedural vision in biological knowledge is associated with a dialectical approach to the developing material reality. The connection with the materialistic dialectic of the procedural view determines its significance for modern methodology.

The fourth paragraph - "The biological status of reductionism: elementary converges with complexity." The candidate for the degree, defining the ways of analyzing the problem, states the following fact: elementary character converges with complexity. A whole complex of topical methodological issues of modern science is directly related to this problem. It is argued that the main meaning and significance of the analysis of the concept of elementary character in relation to life is to identify its fundamental, integral nature, the philosophical, methodological, scientific and theoretical aspects of which are organically interconnected with each other. The

¹⁸ Уайтхед А. Н. Избранные работы по философии. - М.: Прогресс, 1990.-718с.

development of biological knowledge demonstrates various aspects (structural, functional, historical) of elementary biological reality. At the same time, their procedural and historical context clearly dominates.

The paragraph notes that the description and understanding of biological phenomena and processes is associated with a procedural vision and approach, which can play a significant role in future biological theoretical constructions. Elementary representations from the point of view of the procedural vision have complex properties. They act as fundamentally indivisible, at the same time complex entities. This characteristic of complex “elementary” raises the question of the boundaries of the structural approach to elementary”. Elementary converges with complexity. It is really considered in the unity of properties, environment, relationships and structural interactions. According to it, the description of biological processes is associated with the awareness of this unity, the awareness of the idea of the continuity of biological realities, which are important in relation to elementary character. Continuity is a special state of matter, which has transformational properties, has a functional dependence at all points of space-time. Hence, it is concluded that biological primary, atomic reality is a reality that constantly arises and develops in space-time and other potential possibilities. Here we have come to such an understanding of material reality, where the difference between what it is and what happens to it disappears. Accordingly, in elementary representations concerning continuous media, separate events, their formation, changes are inseparable. In other words, biological processes have a higher status of developing reality with different potentialities.

So, the procedural vision contributes to the understanding of living matter from the side of motion, acts as the main requirement of the dialectical approach to reality, and promotes comprehension of the functions of reality of its capabilities as an integral organization. This attitude towards reality acts as a programmatic activity in scientific theory, which denies the metaphysical state. The procedural approach to biological realities, the candidate notes, has a

wide general scientific and interdisciplinary significance and in this sense requires a thorough philosophical analysis. The general focus on interdisciplinarity, the integrity of the procedural approach in science testifies to its philosophical, methodological and ideological significance in general.

In conclusion, the dissertation summarizes the overall result of the study, draws up the main conclusions and indicates its possible prospects.

The main content of the dissertation is published in the following works:

1. Диалектика самоорганизации и регуляции элементарных биологических процессов// Azərbaycan Milli Elmlər Akademiyası. Fəlsəfə, sosiologiya və hüquq İnstitutun Elmi Əsərləri, Beynəlxalq elmi-nəzəri jurnal №2 (21).-Bakı, 2013.-s.39-46

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