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ON THE ISSUE OF THE SPECIFICITY OF PHILOSOPHICAL INTERPRETATION OF NATURAL SCIENTIFIC (SYNERGETICS) AND SOCIO-HUMANITARIAN (PSYCHOSYNERGETICS) KNOWLEDGE. INTER- AND TRANSDISCIPLINARY RESEARCH

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In memory of Hermann Haken
German scientist who gave the world synergetics – a new type of science, the subject of which is distributed among many sciences.

PART ONE
INTRODUCTION

At the end of the 20th century, fundamentally significant changes of an ideological and methodological nature took place in philosophy and science: a re-evaluation of classical epistemology, shifts in the mental and spiritual atmosphere of science and society.

In their most concentrated form, the named tendencies found their expression in the theory of change (I. Prigogine 1947, 1984)[1,2] and in a new interdisciplinary scientific field – synergetics (term of G. Haken, 1973)[3], which gave rise to psychosynergetics and alphalogy (terms of Yershova-Babenko, 1989; 1998).

Synergetics literally “burst" into the scientific world 50 years ago (terminologically) and by the end of the 90s had filled many disciplines, reaching philosophy (methodology). There was a transition to inter- and transdisciplinarity in science, philosophy and methodology, including synergetics itself. This is not surprising, since the modern stage of development of scientific knowledge can be characterized as a "thirst" for unified conceptual foundations. Having started with the idea of unity, humanity, wise with scientific knowledge, is again looking for unity in the third millennium.

It is no coincidence that synergetics declared that one of its main tasks is the knowledge of the cross-cutting patterns in the behavior of nonlinear open

[1] Prigogine I. Étude thermodynamique des phénomènes irréversibles. Paris: Desoer, 1947. 119 p.

[2] Prigogine I., Stengers I. Order Out of Chaos: Man’s New Dialogue with Nature. – New York: Bantam Books, 1984. 349 p.

[3] Haken H. Laser Theory. Berlin: Springer-Verlag, 1973. 302 p.

environments of the most diverse nature: knowledge of the principles of self-organization, subordination, amplification. This turned out to be very timely in the scientific world of the late 20th – early 21st centuries.

The young science, based on mathematics and natural sciences, already by the mid-90s laid claim to ideological positions, raising the question of a synergetic worldview and giving birth to such new scientific fields as psychosynergetics .

Along with this, already in 1999, a question was raised about problems that worry many specialists in synergetics – about the need to search for a new paradigm, and reflections on a new scientific picture of the world, perhaps even a post-synergetic one.

However, the problem here was not in synergetics itself, but much deeper. This is a separate issue related to the nature and pace of development of scientific knowledge in general. Synergetics needs purposefully develop as a full-fledged science and methodology, as a general scientific research program[4].

1. The problem of re-evaluation of classical epistemology in the 20th century

At one time, the first twenty years of the development of synergetics (counting from the time the term was introduced) created the need to generalize the research results available at that stage from established scientific schools, as well as individual authors.

As is known, each historical period of development of society, philosophy and science is characterized by its own specific worldview positions and meanings, ideals of scientific knowledge, methodological approaches to understanding reality, theoretical foundations of the vision of the world. However, the last 50 years have sharply increased the need not only for inter-, but now also for transdisciplinarity.

Of course, in the development of any area of culture: science, medicine, education, art, the role of worldview as a system of adequate ideas about the world, about a person's attitude to the surrounding reality and to himself, the role of worldview as a system of principles of knowledge, conditioned by these ideas, is great.

But the researcher always has to accept a certain "reference point", a system of measurements, a theoretical and methodological position in the course of analysis, reasoning or research. In this situation, the task set by synergetics – the knowledge of the cross-cutting patterns in the behavior of nonlinear open environments of the most diverse nature: physical, biological,

[1] Добронравова І. С. Практична філософія науки. Зб. наук. Пр. Суми: Університетська книга, 2017. 352 с.

social, economic, mental, informational, etc. through the knowledge of the principles of their self-organization led to the possibility of a cross-cutting transdisciplinary application of the principle of self-organization. The new theory of self-organization gave rise to the possibility of a dialogue between natural science and the humanities, medicine, technology, art in the language of mathematics.

In the second half of the 20th century, the world community of scientists faced the problem of re-evaluating classical epistemology in the field of philosophy and natural science, medicine and the humanities (psychology, sociology, political science, etc.). A situation arose in which the results of research by representatives of natural science, be they physicists or biologists, geologists or chemists, to a greater extent than before, began to have a direct and strong impact on the idea of the scientific picture of the world. In turn, mathematical models led to philosophical and general methodological conclusions, to a new scientific paradigm, a new scientific style of thinking.

2. The intersection of Western and Eastern worldviews – chaos, order and synergetics

A number of concepts that were previously considered to be narrowly - specialized are now becoming inter- and transdisciplinary, generally significant, and go beyond the specific context and the specific tasks for which these concepts arose. Interdisciplinarity is characterized by a creative function, since it was precisely at the moments of interaction between different systems of thought – from different eras, religious and cultural traditions and areas of knowledge – that events occurred that had the most far-reaching consequences (Werner, Heisenberg). Such concepts include the concepts of openness, chaos, instability, turbulence, etc. The latter, for example, came out of thermo-dynamics, and today is of general scientific interest. Similarly, the concept of "chaos". It was considered a synonym for the absence of order, and modern science considers it a creative principle (Prigogine) – varieties of chaos are distinguished. Interestingly, this concept played a very significant role in the worldview of ancient philosophers, in particular, representatives of Plato's school. And, for example, two provisions formulated by them have retained their meaning when using the concept of "chaos" in modern physics. Thus, we also see the reverse process – the direct influence of ancient philosophy on modern natural science.

According to the ideas of Plato and his students, chaos (in modern language) "is a state of the system that remains as the possibilities for the manifestation of its properties are eliminated". On the other hand, from a system that is initially in a chaotic state, everything that constitutes the material content of the universe arises. Plato assigned the role of the creative force – the creator – to the Demiurge, who transformed the original Chaos into

the Cosmos. Thus, according to Plato, all materially existing structures are generated from Chaos.

In physics, the concepts of "chaos" and "chaotic motion" are fundamental, but still not precisely defined. For example, the motion of atoms in any system that is in a state of thermal equilibrium is chaotic. Likewise, the motion of Brownian particles, that is small but macroscopic bodies, is chaotic. In this case, the concepts of thermal and chaotic motion are synonymous. Thus, physicists speak of chaotic – thermal oscillations of charge and current in an electric circuit located in a thermostat, of chaotic thermal motion of electromagnetic radiation, etc. Thus , we see that in all these cases we are talking about motion in a state of thermal equilibrium. At the same time, the concept of "chaos" and "chaotic motion" is widely used to characterize states far from thermal equilibrium, for example, to describe turbulent motion.

In the works on synergetics of the mid-90s, the correlation of elements of the synergetic worldview with some ideas of philosophical traditions is particularly emphasized, namely, the correlation of synergetics with the traditions of Western philosophy and Eastern worldview orientations, ways of understanding the world.

Thus, for example, the correlation of the ideas of synergetics with the ideas of not only Plato, but also Aristotle is noted: this refers to the ideas of eidoses as potential forms – images of processes, correct, perfect polyhedrons, about entelechy as an internal energy inherent in being, prompting it to acquire a certain form; with the ideas of René Descartes: this refers to his teaching on cosmic vortices as proper forms of nature's organization; with the ideas of G. Leibniz – monadology, pre-established harmony, coherence, mutual agreement of all parts of the world, the idea of preformism, potentially inherent; with the ideas of F. Schelling: the concepts of an organism and self-organization in nature by analogy with the creative quest of the human spirit.

In general, examples of such intersections of the synergetic vision and the worldview traditions of Western philosophers (some of which have already been mentioned above) can be preliminarily expressed in the following list:

a) Plato's perfect bodies; b) Descartes' cosmic vortices; c) Leibniz's doctrine of monads; d) Nietzsche's image of becoming in chaos; d) Bergson's creative evolution; e) Heidegger's modes of time, etc.

The new scientific paradigm today includes the theory of change, indeterminism, nonlinearity, the new theory of self-organization, the general theory of evolutionary systems, global evolutionism, etc. (See the works of I. Prigogine, G. Haken, E. Laszlo, and others).

In the late 1980s, Fritjof Capra, an American physicist and deep ecologist of Austrian origin, in his book "An Examination of the Parallels between -

Modern Physics and Eastern Mysticism", "The Tao of Physics" (1975)[5] sets out the philosophical aspects of science from an Eastern perspective. He reveals the profound interconnection between the worldviews of physicists and mystics (Taoists, Hindus, Buddhists, Zen Buddhists), and finds confirmation in modern physics of many postulates of the ancient religious teachings of the East. The author examines their interconnection and the interpenetration of the cultures of the rational West and the mystical East that began in the 20th century as a confirmation of the ancient Chinese idea of the need for a dynamic balance between the external and internal, the rational and the intuitive-mystical.

Thus, problems that were considered highly specialized were rethought at the end of the 20th century as philosophical-ideological, methodological, epistemological, inter- and transdisciplinary.

Our era is generally characterized by active changes in all spheres of life. Moreover, these changes are accompanied interpenetration of all spheres of human activity into each other. Political, economic, social, scientific, technical, cultural and spiritual aspects of society's life today, as never before, are not only developing, but also "flying apart", disintegrating, destroying the single whole that they formed. An important component of integrity, as is known, is science. (But destruction too). Scientific knowledge is rising to a qualitatively new level, profound changes are taking place in the forms of knowledge organization, new scientific directions and branches are constantly emerging, such as, for example, artificial intelligence, despite the ambiguity of the term. This refers to the illusory nature of such a phrase for society and man, since what is called this term in reality is more like a super-fast computing machine with algorithms programmed by humans. (But everything changes so quickly that even this is debatable.)

In this regard, one of the pressing issues is the philosophical, ideological, methodological and conceptual analysis of the emergence, functioning and development of new generalizing ideas and scientific directions. Before our eyes, after a long break, conceptual models, new philosophical categories and principles are born, such as "whole-in-whole/whole as a whole" (Yershova-Babenko, 2005) – the next step complementing "part – whole". The rate of change in science is so high that there is a lack of ready-made terms and specialists create concepts denoting the unity of several phenomena, such as the concept of "brain-psyche (consciousness, mind, ...

[5] Capra F. The Tao of Physics: An Exploration of the Parallels Between Modern Physics and Eastern Mysticism. Berkeley: Shambhala, 1975. 366 p.

its other components) " – "brain – psyche (consciousness, mind , ...)"[6,7]. In essence, this approach covers a wide range of issues related directly and indirectly to the emergence of new scientific knowledge, in particular, inter- and transdisciplinary areas, including in philosophy, such as psychosynergetics and alphalogy.

Interdisciplinary research is becoming especially relevant in our century. Firstly, as Schrödinger noted, "we have inherited from our ancestors a keen desire for holistic, comprehensive knowledge and ... only now are we beginning to acquire reliable material to bring together what has hitherto been known". Secondly, the path to a unified science from disciplinary organized knowledge passes through the synthesis and integration of different disciplines. Depending on the characteristics of the science itself, on its environment, when certain generalizing ideas are put forward as particularly significant.

Transdisciplinarity is considered today by philosophy and science in the broad context of transformations of value and ethical priorities, creation of new ways of cognition and their coordination with practical tasks. In the meantime, the opposite often happens – first a solution to the problem arises and it is thrown into society without a theoretical basis and experimental confirmation. Therefore, researchers attach increasing importance to the issues of assessing the risk of such results, having designated the phenomenon of transdisciplinarity, the fact of its expansion, the need for new conditions of equally rapid coordination/"pulling up" of theories and methodologies. In the study of such complex, not static, but rapidly changing phenomena, the issues of knowledge security and its experimental unconfirmation "in the long term" come to the fore. New directions are emerging – conceptual analysis of human-dimensionality (I. Yershova-Babenko, Ukraine), mechanisms of the nature of human action (Dr. M. Keestra, University of of Amsterdam). In the conceptual model "man (subject, creator/performer) – computer (object, subject of a new type)/man-computer-man" new aspects arise, the need for their awareness in new definitions. This monograph, in fact, is perhaps the first publication in Ukraine devoted to the comprehension, on the one hand, of the phenomenon of transdisciplinarity with the introduction, finally, of man into the model of Nature, an emphasis on the dialogue of man with man, on the other – the connection of this phenomenon with synergetics and psychosynergetics, and on the third, with a new level of knowledge –

[6] Yershova-Babenko I. Integrity and initial "hybridity" of the "brain-psyche-mind/consciousness" hypersystem. Research methodology. *Norwegian Journal of Development of the International Science*. 2019. №31 (2). P. 58–64.

[7] Yershova-Babenko I. The problem of a new scientific picture of the world. World of «digits» and «digital subject». *Norwegian Journal of Development of the International Science*. 2020. №44 (2). P. 53–60.

conceptual analysis within the framework of the conceptual model "whole-in-whole/"whole as a whole", the concept "brain – psyche (consciousness, intelligence, ... its other components)"/"brain – psyche (mind, consciousness, ...)".

The major changes that have taken place in the world of science in the last decades of the 20th century have shown that at the intersection of several sciences a new, rapidly developing ("accelerated mode") area of research has emerged – synergetics, which, despite contradictory assessments, is considered promising today.

The purpose of this science is to identify general patterns in the processes of formation, stability and destruction of ordered temporal and spatial, or both together, structures in complex nonequilibrium systems[8]. Synergetics, as follows from its goal formulated by G. Haken at the turn of the 90s, is engaged in the knowledge of the complex; the search for new universal patterns of self-organization of complex systems. It is aimed at: revealing the universal mechanisms of self-organization and evolution of complex systems, systems of any type, both natural and human-dimensional, including cognitive systems; revealing the end-to-end connection of various levels of existence: the micro level, the macro and mega levels familiar to us. There is a similarity of processes, a common pattern of events occurring at different levels of organization, there are common geometries of behavior. The development of processes at one level is not completely independent of the course of processes occurring at lower and higher levels. Under certain conditions of instability, microfluctuations (or weak mega-influences) can break through to the macroscopic level of existence and determine the macro picture of the process as a whole.

Synergetics establishes bridges: between dead and living nature; in the dead, there is a search for the features of the living, elements of self-completion, something similar to intuition, and in the living, there is a search for the dead, for what is common with the dead, what is already predetermined, preformed in the dead, in the laws of the Evolution of the Universe, between the goal-like behavior of natural systems and the rationality of man, between the process of the birth of something new in nature, the "creativity" of nature and the creativity of man.

Synergetics can pose new, non-standard questions to researchers in the field of natural science and the humanities – psychologists, cognitive scientists, epistemologists – that open up promising paths.

Synergetics is written about in different ways. Let's consider its assessment in chronological order.

[8] Haken H. Synergetics: An Introduction. Nonequilibrium Phase Transitions and Self-Organization in Physics, Chemistry and Biology. 2nd ed. Berlin: Springer-Verlag, 1991. 456 p.

3. 70–90s – development of synergetics

These years were of great importance for synergetics.

In 1977, the book by G. was published in the USA in English. Nikolis and I. Prigogine "Self-organization in nonequilibrium systems"[9].

In 1978, the Solvay Congress "Order and Fluctuations in Equilibrium and Nonequilibrium Statistical Mechanics" was held in Brussels, the proceedings of which were published in 1981 under the editorship of G. Nicolis. And etc. – "Order and Fluctuatticus in Equilirium and Nonequilibrium Statistical Mechanism/Ed.G. Nicolis, *G.* Dewel, JM Turner". – John Wiley and Sous, NY, 1981.

In 1978, G. Haken's book "The Theory of Nonequilibrium Phase Transitions of Self-Organization Processes in Physics, Chemistry, and Biology"[10] was published in German.

Many of the questions touched upon in the books mentioned and discussed at the Solvay Congress were posed and resolved relatively long ago. The emergence of the theory of self-organization – synergetics – was prepared by the works of many outstanding scientists. These were C. Darwin – the creator - of the theory of biological evolution, L. Boltzmann and A. Poincaré – the founders of the statistical and dynamic description of complex movements. And also many, many others.

The years 1977–78 are considered to be the years of birth of a new, unifying direction in modern science. In order to emphasize the role of collective cooperative effects in self-organization processes, G. Haken called the new direction synergetics[11]. Despite the fact that the expediency of introducing this new term has been repeatedly and vigorously disputed, it is still used. In any case, an alternative term has not yet been put forward.

After the Solvay Congress, the synergetic direction developed rapidly. This was also facilitated by the fact that, on the initiative of G. Haken, the Springer publishing house released a special series of books on synergetics – Springer Series in Sinergetics. It can rightfully be considered international.

So same in the 80s years, and exactly in 1983 year, the publishing house "Springer" releases already the 20th volume series "Synergetics" – Springer Series in Sinergetics Editor Herman Haken Volume 20, Advanced Sinergetics

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[9] Nicolis G., Prigogine I. Self-Organization in Nonequilibrium Systems: From Dissipative Structures to Order through Fluctuations. New York: Wiley, 1977. 462 p.

[10] Haken H. Theorie der nichtgleichgewichtigen Phasenübergänge und der Selbstorganisation in der Physik, Chemie und Biologie. Stuttgart: Springer-Verlag, 1978. 362 S.

[11] Haken H. Synergetics: An Introduction. Nonequilibrium Phase Transitions and Self-Organization in Physics, Chemistry and Biology. Berlin: Springer-Verlag, 1977. 355 p.

Instability Hierarchies of Self-Organizing Systems and Devices. Springer – Verlag Berlin, Heidelberg, New York, Tokyo.

1983. The mathematical apparatus presented in it is currently used to describe a wide class of nonequilibrium phase transitions that form self-organization processes.

Thus, in the second half of the 80s an attempt was made:

1) to provide an idea of the tasks of synergetics in various fields of knowledge – physics, chemistry, biology, general theory of computer systems, economics, ecology, sociology;

2) identify common features of the problems considered in them;

3) demonstrate the commonality of the mathematical apparatus, which is evident in both dynamic and statistical descriptions;

4) present the concepts and theoretical methods of synergetics.

Already during this period, many examples demonstrated the unity of the basic concepts of self-organization: – the principle of subordination and the order parameter of G. Haken; – dissipative structures and nonequilibrium phase transitions of a new type of I. Prigogine.

On the pages of the book named by G. Haken emphasized that the paths leading to self-organization are also common. Thus, the unified approach being developed to the description of evolutionary phenomena, self-organization phenomena is expedient and fruitful, as is the introduction of a unifying term.

It was in the mid-80s that the question was raised about the place of synergetics among the sciences, about its significance in its unifying role, and not in its opposition to other sciences, in particular, nonequilibrium thermodynamics[12].

As usually happens in the early days of a young science, there were disagreements on certain issues. For example, some scientists did not agree with the statements of G. Haken, who wrote in 1983: “It is quite obvious that each of the scientific disciplines we have listed (and many others) has sufficiently compelling reasons to consider synergetics as a part of it. But at the same time, each time synergetics brings in characteristic features, concepts and methods that are alien to traditionally established directions. Thus, thermodynamics operates at full strength only if the systems under consideration are in thermal equilibrium. Thermodynamics of irreversible processes is applicable only to systems near thermal equilibrium. Synergetic systems in physics, chemistry, biology are far from thermal equilibrium and can exhibit such unusual features as oscillations. Although the thermodynamic

[12] Prigogine I., Nicolis G., Connelly R. Self-Organization in Nonequilibrium Systems: From Dissipative Structures to Order through Fluctuations. New York: Wiley, 1989. 462 p.

concept of "macroscopic variables" is also used in synergetics, such variables, called order parameters, have a completely different nature than in thermodynamics" (p. 361)[13]. Similarly, another statement: "... in recent years it has become clear that such approaches (including some generalizations, for example, the thermodynamics of irreversible processes) do not provide an adequate description of physical systems that are far from thermal equilibrium, or economic processes. The reason is that these approaches are static in nature..." (same place).

As already mentioned, the emergence of the theory of self-organization – synergetics was prepared by the works of many outstanding scientists, whose works became, in fact, an independent source of synergetic research that unfolded in the 70-80s.

In this regard, attention is drawn to studies in the field of applied mathematics, close to the focus of the works of G. Haken, his order parameters, to the studies of the development of thermodynamics and statistical physics of I. Prigogine, works on morphogenesis in the aspect of self-organization. Synergetics is understood in this period both as a collective synonymous physical and mathematical doctrine of self-organization, and as a research area that develops around the concept of "self-organization" and therefore the name synergetics "covers a number of scientific areas, including those that avoid using this term".

Synergetic research actually goes back to the study of physical and mathematical problems, the doctrine of distributed systems, continuous media, examples of self-organization in the field of sciences of living nature and human society. The palm of primacy here belongs, among others, to Kiev physicists. Since synergetics developed under the influence of a number of areas of the theory of nonlinear oscillations, a large role was played by the problems of nonlinear optics, plasma physics, etc.

Thus, at the turn of the 70s, an important shift occurred in scientific ideas about determinism and probability, which by the end of the 90s was assessed as commensurate with the shift caused by the statistical interpretation of quantum mechanics and the formulation of V. Heisenberg's uncertainty relations.

Order "by Ilya Prigogine and Isabella Stengers was published in London. out of chaos", (the French version of 1979 was called "New Alliance. Metamorphoses of Science") – it can perhaps be considered the founder of the direction that was called "synergetics" (although Ilya Prigogine himself preferred not to use this term).

[13] Haken H. Synergetics: An Introduction. Nonequilibrium Phase Transitions and Self-Organization in Physics, Chemistry and Biology. Berlin: Springer-Verlag, 1983. 367 p.

Reference. Ilya Prigogine – Nobel Prize laureate in 1977 for his work in chemical thermodynamics. He headed a large group of physicists at the University of Brussels, was director of the Solvay Institute and the Center for Thermodynamics and Statistical Physics at the University of Texas.

The place and role of synergetics in the system of modern science are determined by the following features. Firstly, having arisen as a result of active interaction of many branches of natural scientific knowledge, synergetics, in turn, has become an important integrating and synthesizing factor of modern science. It can serve as an indicator of the application of a new form of integration and synthesis of scientific knowledge. Secondly, since synergetics presupposes a further departure from the entire system of ideals and norms of classical science, this causes difficulty in describing synergetics in the previous categories and, apparently, there is a need to introduce new criteria that take into account both the features of new objects of scientific research and the characteristics and trends of development of modern science, its social determinism. Thirdly, synergetics has no specific subject of study in the sense that it studies the processes of self-organization that manifest themselves everywhere, in all cases when the necessary combination of external and internal factors and conditions is created for this. Fourthly, synergetics has points of support within various natural and humanitarian sciences. Finally, unlike traditional natural sciences, synergetics arose at the intersection of mathematics and conceptually developed natural sciences.

1989. According to scientists, synergetics demonstrates a new approach to studying self-organization processes, in which they are studied not from the point of view of any particular scientific discipline, but from the position of a general interdisciplinary approach; it attempts to reveal the unified principles of self-organization in any natural systems. In other words, synergetics studies all self-organization processes occurring at all levels of matter organization from a single point of view and in this sense removes the distinction between living and nonliving nature. This scientific direction has made it possible to build a bridge between the natural and human sciences.

A distinctive feature of synergetics is its emergence from the interaction of several theoretically and conceptually highly developed mathematized disciplines. However, since modern mathematics does not have a specific method with which it would be possible to describe the processes of self-organization, a synthesis of several of its methods is necessary. The synthesis of the theory of toposes, bifurcations, fluctuations near nonequilibrium states allows us to adequately describe the processes of self-organization occurring at all levels of the organization of matter.

But mathematics cannot cover all aspects and sides of self-organization, and to study it, a complex of physical, chemical, biological and mathematical methods is needed.

Synergetics has not only united various scientific disciplines and made it possible to study from a single point of view the processes of self-organization occurring at all levels of the organization of matter, but also set before philosophical science a number of problems that are relevant and total for all scientific knowledge. For example, the problem of nonlinearity, instability, nonequilibrium of self-organizing systems/environments, the process of evolution of matter, the place and role of man in the process of cognition, etc. Among them, methods of studying self-organizing systems/environments occupy a far from last place, because the method is the key to understanding the essence and tendencies of development of the reality under study. (Clarification of the features of the objects under study, research methods and, on this basis, the emergence of opportunities for improvement, as well as the creation of new methods, which is of great importance both in advancing science in depth and in the constant study of important philosophical and methodological problems).

There are many works that in one way or another deal with this problem. Basically, these are either specific natural-scientific studies or abstract constructions of a general philosophical nature. There are also philosophical-methodological works devoted to the study of the essence, content and definition of synergetics. Synergetics is also considered in the light of the general methodological principles of the natural sciences.

1994. More than 20 years after the term was coined. Synergetics is interpreted as a theory of non-stationary, rapidly developing structures in open non-linear environments (systems). The focus is on evolving (metastable) structures, fast, avalanche-like processes (the so-called “aggravation modes”), and principles of co-evolution of complex structures. Thus, synergetics is considered in this period as a new movement in modern science, marking the formation of a new view of man on the world and on himself in this world; as a new approach to understanding crises, instability and chaos, and to creating means of managing them.

However, by the mid-90s, many scientists still refused to recognize synergetics as an independent science. But let us remember what also happened with cybernetics, and with catastrophe theory, and even with topology.

But at the same time, it is quite indicative that in these same years, Ukrainian philosophers began to pay increasing attention to synergetics. It was at the Institute of Philosophy of the National Academy of Sciences of Ukraine in 1993 and 1994 that perhaps the first philosophical doctoral and candidate dissertations on synergetics were defended.

1994. A conference was held at the Odessa State Polytechnic Institute, where a section was first established: “Synergetics and Psychosynergetics”, and in May 1996, an independent scientific and practical conference

“Psychosynergetics – on the Border of Philosophy, Natural Science, Medicine and the Humanities. Problems and Prospects” was held at the Odessa State Medical University by the Institute of Interdisciplinary Problems, and a course of lectures for young researchers “Philosophy, Methodology, Synergetics and Science. An Experience of Understanding What is Happening” was published.

In general, 1996 became, as they say, a turning point in the development of synergetics. 1996. 1997. 1998. Or almost 30 years later.

January 1996. With the support of Dr. Vladimir Poremsky (Germany, Frankfurt, who unfortunately died in 1997), a synergetic forum was held, at which leading scientists from many countries of the world discussed issues of a synergetic vision of the world.

March 1997. The issues of synergetics received further development in psychology, which was started in Ukraine in 1993.

November 1998. After 25 years, the second synergetic forum “Synergetics and Society: Prospects of Post-Communist Modernization” was held.

The 90s show that the popularity and role of synergetics increased significantly with each hour. Many original works, reviews, monographs, and textbooks on various systems of synergetics or self-organization theory appeared.

CONCLUSIONS

Thus, the conclusion is obvious that despite the different interpretations of the field of application of synergetics by various scientific schools, since the publication of In 1977, in English, the book by G. Haken, in which he attempted to present a constructive approach to the theory of formation of temporal, spatial and spatio-temporal structures, was published, enough conferences, symposia, and forums were held to make the following fact obvious: in the second half of the 20th century, science faced the problem of the insufficiency of existing tools for studying phenomena that belong to the class of complex and self-organized systems/environments. This caused the need to search for new tools for research, and, most importantly, to rethink research positions, positions of philosophy, methodology, and finally, the worldview of scientists.

The expansion of the meaning of synergetics (the paradigm of self-organization) as an interdisciplinary direction of scientific research by the end of the 90s of the twentieth century led to the awareness of its ideological meaning. It became obvious that under the influence of the ideas of self-organization, not only a change in the conceptual structure of thinking occurs, but also in our vision of the world, our worldview and our position in life.

The influence of synergetics has spread to the conceptual component and principles of the structure of scientific pictures of the world through the philosophical categories of space and time, restructuring their perception,

through the principle of self-organization, demonstrating the breadth of its applicability, offering us an idea of the instability of the world, its nonlinearity and openness (various versions of the future), the increasing complexity of formations and their unification into evolving wholes.

SUMMARY

The issues of philosophy of science in the historical and philosophical dimension are considered through the prism of inter- and transdisciplinarity. The development of conceptual and methodological positions of the philosophy of science is demonstrated on the material of the formation and development in the second half of the twentieth century of synergetics of the German scientist G. Haken and psychosynergetics of the Ukrainian scientist I. Ershova-Babenko. It is shown how the principle and theory of self-organization enters, combining natural science and humanitarian knowledge on this theoretical and methodological basis. The specificity of synergetics as a new type of science, the subject of which is distributed in different sciences, is emphasized. A new conceptual model and philosophical category of "whole-in-whole/whole in whole" are presented. The concept of "brain – psyche (consciousness, mind, ...) " is also presented, expressing the unity of the brain and psyche in their activity and the generation of a new product by them – "unaccounted subject". The named conceptual model and concept make it possible to describe the idea of unity, integrity and complexity of the subject as an object of research.

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