SOCIO-CULTURAL PRINCIPLES OF SYNERGETICS

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ABSTRACT

This article analyzes the socio-cultural principles of synergetics. It highlights the factors of interaction, self-organization, and stability in social development. The synergetic approach is presented as an important methodological foundation for understanding the complex dynamics of culture, science, and social systems.

Introduction. Synergetics is a modern post-nonclassical scientific field that studies the laws of self-organization in complex systems. The word comes from the Greek *synergeia*, meaning "cooperative action." In its essence, the term expresses the harmonious interaction of humans, nature, and society. Although synergetics first emerged within the natural sciences, it later demonstrated its philosophical and methodological power in explaining social and cultural systems as well.

The German scientist H. Haken defines synergetics as "a theory that answers the question of how a whole can produce new qualities that are not present in its individual parts." He writes: "With the help of synergetics, we can explain why a whole becomes more or less than the sum of its parts, and how order arises out of chaos." Within this approach, human society is also viewed as an open and ever-changing system. According to Haken, humanity is driven not only by strict laws, but also by creative instability. Thus, instability is a natural condition for development.

Literature reviyew. Russian scholars E. Knyazeva and S. Kurdyumov define synergetics as "a new mode of thinking that unites deterministic and probabilistic worldviews." According to them, "order arises only from instability, from chaos." For this reason, they view the process of cultural development as a process of self-organization. In our opinion, this approach makes it possible to interpret human history not only as the result of rational decisions, but also as a complex process unfolding through the interplay of chance, creativity, and instability.

V. Stepin describes synergetics as "the scientific core of post-nonclassical thinking." In his view, synergetics is now not only a methodology of science, but also "an ontological model that restores the integrity between the human being, nature, and society." Stepin considers this theory a conceptual approach that unites all sciences within a single conceptual framework. He warns, however, that "synergetics is not a philosophy capable of explaining everything, but a

tool for studying complex systems." This idea, in our view, reduces the risk of overgeneralization and strengthens synergetics as a practical methodological instrument in social analysis.

American futurist A. Toffler interprets synergetic principles as a model of the evolutionary stages of human development. He writes that "at the center of the modern scientific revolution stand the ideas of synergetics." In his "Third Wave" concept, Toffler regards the crisis of industrial society as a "civilizational bifurcation"—a point of transition toward a new cultural form. Nevertheless, in his views the complexity of society is simplified, and historical processes are expressed more metaphorically.

N. N. Moiseyev explains the social application of synergetics through evolutionary alternatives. He states that "at a bifurcation point, even the smallest change determines the future direction of the entire system." This idea supports the philosophical notion that even a small human action can trigger major historical transformations. At the same time, in Moiseyev's model human agency is interpreted more as a mathematical variable, which somewhat limits human freedom.

L. Kiyashchenko and P. Tishchenko see the main virtue of synergetics in its "ability to unite natural-scientific and humanitarian modes of thinking within a single logical framework." They write: "Synergetics renders different scientific fields isomorphic, making their comparison legitimate." This approach actually creates the philosophical foundation for the integration of knowledge—it eliminates boundaries between disciplines and enables a holistic understanding of the world as a complex system.

N. T. Arefyeva analyzes synergetics as a methodology for forecasting socio-cultural processes. She warns that "caution is required when fully transferring synergetic models derived from the natural sciences to the social sphere." According to Arefyeva, each society has its own specific laws, and they cannot be completely adapted to synergetic models. At the same time, she regards synergetics as a modern mechanism for maintaining social stability and managing cultural renewal.

Thus, synergetics serves as a new scientific paradigm for social philosophy, encouraging humanity to manage complexity and to view chance as a creative opportunity. According to this view, society is an open, dynamic, and self-organizing system. "Chaos" is no longer a threat but the starting point of a new "order." Therefore, the socio-cultural principles of synergetics call on the individual to adapt to complexity, manage instability, and understand culture as a living system that develops autonomously.

Research Methodology. Synergetics reveals broad and promising possibilities for understanding issues related to the information revolution, the active capacities of the human being, the activation of creative intuition and productive imagination, as well as the development of science and culture throughout history — in short, problems linked to human thought and creativity. For this reason, contemporary science is moving toward developing social synergetics or homosynergetics in all directions. That is, scholars are striving to shape synergetic ideas that bear a distinctly human face. Today there is a strong need for a synergetic paradigm capable of understanding the human being and the phenomenon of human culture in all its diverse forms, explaining the mysteries of artistic and scientific creativity, knowledge, health, education, communication, human reason, and also its entry into broader social and cultural environments.

Therefore, in many academic works various metamorphic concepts and speculative ideas arise in the pursuit of a humanitarian, humanistic synergetics. These include: patterns of self-organization and the "geometry of human behavior"; fractal diagrams of historical events; the thoroughly described mental (or socio-cultural) landscapes of "yesterday – today – tomorrow"; "here-and-now" situations where the irreversible past meets an abruptly emerging future; cognitive maps of the individual; scenes of "densification" and "rarefaction" of cultural innovations — all of which are visual images introduced by synergetics and capable of becoming growth points for humanitarian knowledge. Thus, synergetics is being applied to understanding various phenomena in nature and human existence. Because these synergetic approaches originate from diverse modifications and rather abstract explanations, they are not easily understood by everyone. Moreover, the synergetic system of knowledge itself develops only through and because of the "synergetic approach."

From a socio-cultural perspective, synergetics may be defined as a positive heuristics — a science that studies constructive creative thinking — or as a method of conducting an experiment with reality itself. Yet it is not a tool that yields predetermined outcomes; rather, it is a doorway opened toward the reality of nature or human life, expecting answers from that reality itself. To view the world with synergetic eyes, to interpret events or phenomena from a synergetic standpoint, and to try to observe what else may emerge — this is essential. Synergetics is not only a method of revealing reality, but also a method of creating reality. It is a way of seeing the world differently and positioning oneself actively within it. Synergetics makes it possible to view old problems in a new way, to reformulate questions, and to rebuild the problematic field of science anew. In this sense, we support an experimental or "playful" synergetics, built on mathematical-analytical calculations and computer modeling of processes occurring in open nonlinear environments. Here the point is to use acquired knowledge freely and to attempt heuristic applications of this knowledge to the most diverse domains. Synergetics can be used not only as a serious science but also as a tool for experimentation — as a way of playing with reality.

As I. Prigogine and I. Stengers have shown, the theory of self-organization or the synergetic paradigm brings forth a new form of human communication with nature. It also calls the human being to new communication with the self and with others. Indeed, a nonlinear situation — a bifurcation point of evolutionary paths or an unstable state of a nonlinear environment — is connected with sensitivity to small influences, uncertainty, and the possibility of choice. When a subject selects a future path, they orient themselves toward one of the evolutionary pathways defined by the internal characteristics of the environment and, at the same time, toward the values they themselves prefer. They choose a path that is most comfortable for them and that can realistically be realized within this environment. For this reason, synergetics can be regarded as the best way of engaging with a nonlinear situation.

Overall, synergetics is an approach that studies processes closely linked with optimism — a hopeful outlook on the world and life. From this perspective, in today's rapidly changing and unstable world, applying a synergetic approach is of great importance. It is an optimistic attempt to understand the principles of evolution and co-evolution of complex systems, to uncover the causes of instability, chaos, and evolutionary dead-ends, and to master methods of nonlinear control over unstable complex systems. The main problem in this process is how to manage without direct management, how to shift a system toward one of the subject's

personally desirable developmental paths with minimal resonant influence, how to ensure self-governing and self-sustaining development. Another key question for modern science is how to overcome chaos—not by eliminating it—but by making it creative and acceptable, turning it into a field that sparks innovation. Indeed, breaking the ancient stereotype of fear before chaos and seeing the beauty and creativity of chaos is a *tour de force* — the true courage of synergetics! Smallness and disorder are beautiful precisely because they create the conditions for the birth of the "new."

From a synergetic perspective, beauty can be viewed as a phenomenon situated between chaos and order. Beauty is not perfect symmetry, but a subtle disruption of symmetry (order). Hence M. Bakunin writes: "Synergetics helps us understand destruction as a creative principle, and the desire to destroy as a desire to create; for only by breaking with the old, only by reversing processes and turning them toward an opposing order, only from the remnants of the past can something genuinely new be built." A nonlinear (synergetic) situation is a situation of playing with reality. It is a form of physical experiment or a mental and existential game, freeing the subject from being lost among various paths leading toward the future. In this evolutionary game nothing is predetermined except the most general rules. These rules function as prohibitions placed upon certain evolutionary paths that are incompatible with the nature of the complex system (the environment).

A nonlinear situation is not designated or controlled by the subject; rather, it designates and governs itself. Whether it is a natural situation, a situation of communication with another person, or a situation of communication with oneself, it somehow occurs and creates conditions for the subject's self-manifestation. A nonlinear, creative attitude toward the world thus means the opening of the possibility of self-creation and self-making. It is granting a nonlinear situation or another person the opportunity to influence oneself. It is creating oneself from an "other." A similar principle can be found in Paul Valéry's verse: "Whoever is created is also a creator." Indeed, using synergetics as a "positive heuristics" is naturally linked to the development of a playful consciousness. The synergetic thinker is *homo ludens* — a human who plays. In this sense synergetics becomes a kind of intellectual yoga. It makes everything flexible, gentle, open, and multivalent. Synergetic influence is a gradually unfolding action that arises from one's own strength, forms of organization, capabilities, and potentials. It is a stimulating effect.

Analysis and results. Synergetics establishes connections between living and non-living nature, between the goal-directedness of natural systems' behavior and human intelligence, and between the processes in which the new emerges in nature — "nature's creativity" — and human activity. Three arguments may be offered in defense of applying a synergetic approach to the evolution of scientific knowledge and cultural ideas. These are: first, the evident role of cooperative and coherent influences in science and culture; second, the fruitfulness of the structuralist approach; and third, the long-term testing of this approach and the importance of the informational perspective in science and culture. Indeed, the expansion of thought, the presence of multiple alternatives and scenarios, and the diversity of mental behaviors can be approached most effectively from a synergetic standpoint.

In creative thinking, viewing alternatives, variety, and multiplicity as analogues of chaos plays a distinctly positive and stimulating role. At the initial stage of creative sensitivity, it is often essential to expand the active field as widely as possible and to encompass the greatest

possible diversity of elements of knowledge. In this process, equalizing what is primary and what is secondary, what is important and what is unimportant — that is, radically re-evaluating epistemic values in the face of creative aims — becomes the foundation for selecting the most effective idea. Initial turbulent impressions lay the groundwork for the race of innovative ideas.

First, the mechanism of creative thinking and intuition may be viewed as the self-organization and self-construction of visual and imaginative symbols, ideas, and representations. The self-constructive mechanism is above all an orientation toward the "whole" that is being formed. The rule (plan, guiding idea, or pattern) acts as a reference line for the search. Second, diversification, value-based selection, and the elimination of the "unnecessary" occur. The meaning of hidden rules is selective and filtering in nature.

The mechanism of creative thinking is not random selection of variants, but the choosing of essentials necessary for forming the "whole." Self-organization proceeds around this essential core. Intellectual creative activity — both oral and written — as a cognitive counterpart of chaos involves discarding and ruthlessly eliminating much of what has been accumulated. Third, the mechanism of self-organization in creative thinking appears as a process of filling in the missing parts needed for the "whole" to self-construct and self-assemble. As Gestalt psychologists note, the "reconstruction of insight," the instantaneous formation of a complete structure, does not occur spontaneously. According to the synergetic model, creative thinking implies that a whole emerges from parts as a result of the self-complication of those parts. The flow of ideas and images constructs itself through its own strength and possibilities. Fourth, scientific discovery may be understood as a reconstruction of the problem field, as bringing knowledge into a crystalline (stabilized) state, as an ascent to structure. Moreover, scientific creativity typically contains numerous crystalline states.

In general, the synergetic approach introduces the following innovations into the analysis of scientific knowledge and cultural phenomena:

First, it helps to illuminate the mechanisms through which coherence and interconnectedness of events are established, as well as the mechanisms through which generally accepted cognitive patterns and models of thinking arise. (Indeed, science expresses a collective enterprise; in it, cooperative and corporate influences manifest themselves, shaping collective thought within particular communities.)

Second, it substantiates the role of chaos-like analogies, the diversity of elements of knowledge and experience, and the need to test multiple mental alternatives in order for cognitive systems to function stably and productively. It also accounts for the rapid growth of scientific knowledge and scientific information, the dynamics of *blow-up regimes*, and the alternating emergence of two mutually complementary modes within the scientific environment — namely, the rapid development and localization of processes on the one hand, and their slowing, fading, and "dissipation" on the other.

Third, it aids in analyzing the constructive mechanisms of co-evolution among evolutionary processes, the relative proportions of openness and predetermined elements, the complex hierarchical structures of the "variously aged" layers of individual consciousness, the cognitive activity of the individual and the collective (the scientist's conscious and subconscious systems; scientific schools encompassing multiple generations; layers of intuitive knowledge, such as intuitive notions of human behavior resembling Aristotelian physics in modern society; folk knowledge; institutionalized science; and even paranormal knowledge that does not fit

within established conceptual frameworks). It also helps to explore the possibilities of effectively managing nonlinear systems of consciousness and knowledge through topologically well-organized resonant influences.

Conclusion/Recommendations. Studying the historical development of science and culture from a synergetic perspective proceeds from the understanding that development is strictly nonlinear and cyclical in nature, that its pace is uneven, and that periods of "densification of innovations" (that is, the sudden emergence of talent or creativity) alternate with periods of "rarification of innovations." It is also based on conceptions of the power of paradigmatic consciousness in science and culture, as well as the value of archaic elements.

In turn, analyzing culture from a synergetic standpoint eliminates sharp distinctions related to space and time; in this respect, it approaches poststructuralism and postmodernism, which seek to grant the status of "here and now" to everything that has been lost, half-forgotten, or left behind in history.

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