



# Synergetics: A Historical Analysis of the Ideas of Self-Organization

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**Abstract:** The article comprehensively analyses the history of the concept of self-organization and its philosophical foundations, and also examines the scientific, mythological and philosophical sources of the emergence of the idea of self-organization. The author examined the evolution of ideas about chaos and order in various worldview systems (mythology, Western and Eastern philosophy) and explored their place in human thinking and the development of society.



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## Introduction

Creating a historical retrospective of the concept of self-organization seems to be a difficult task for a number of reasons. This is due, firstly, to the subjective nature of all future historical information, and secondly, to the multi-vector nature of the idea of self-organization and the practical impossibility of thinking precisely both in the past and in the future.

Many researchers who have solved the problem of the regularity of the emergence and change of scientific knowledge refer to the generally recognized period and the history of the considered concept when writing any scientific work. R. Merton wrote about it: "The efforts of a researcher on the historical continuity of scientific ideas are like the efforts of a goalkeeper on a tightrope: a slight deviation in any direction and the balance is lost." On the one hand, the researcher runs the risk of making wrong conclusions where the view of the continuity of the scientific idea does not exist. On the other hand, the continuity of real life can simply be ignored" (Merton, 1996).

## Methodology

A more complex problem seems to be the context offered by the modern, or rather, postmodernist approach to the question of the relationship of earlier ("old") studies to new ones. Within such a perspective, innovation in art, science, and philosophy can be seen, on closer inspection, to be built on the basis of citations and associations with known and already existing ideas. Since the associative layers can go in different directions and in any direction, it seems difficult to solve the problem of "old". M. Foucault, one of the postmodern ideologues, describes this type of discursive practice as a "ceasing, discrete, daring... disordered and destructive, glorious, infinite and enormous boiling" (Leçons sur la volonté de savoir, 2011) defines it as.

We will focus more on the broad historical contour, where we have to talk about the general models of the description of the world that unite the theory of self-organization and other scientific forms of human knowledge. The task thus set requires fundamental historical and theoretical research to carry it out, considering the vast historical material that can be linked to the ideas of synergetics and self-organization.

The emphasis, which is the historical retrospective basis for this research work, can be formulated as follows: although synergetics was discovered in the later stages of human civilization, the methods of understanding the world close to the synergistic view are rooted not only in scientific, but also in other areas of understanding the world characteristic of man. They existed in the earliest cosmogonic forms of myths and legends. Similar motifs can be found in both Western and Eastern philosophical ideas. If you look carefully, all types of human experience of knowing the world: dream, artistic fantasy, everyday knowledge rely on the non-polarized nonlinear synergistic logic of the dynamics of phenomena such as order and chaos, determinism and randomness.

The basis and fundamental research for many modern researches in the field of self-organization is the book "Order out of chaos" by Prigogine and Stengers. Researchers always refer to its principles.

The dynamics of the relationship between order and chaos presented in ancient cosmogonies, with all their inherent variability, unites two worldviews: mythological and synergistic. In this sense, it is necessary to consider in detail the ideas about the ratio of order and chaos in the mythology of Antiquity and the Ancient East. The main rules of these views are revealed in numerous examples taken from the indicated cosmological systems, which can be formulated as follows:

1. Chaos and Cosmos (order) are closely related to each other and exist in a two-way relationship. Chaos is not only a source of destruction of order, but also a creative force that contains at its core the predetermined principles of order. In all fundamental mythological systems, the primary birth of the world took place as a result of the victory of God over the forces of Darkness (Ereb), Abyss (Tartar), Chaos (God Yahweh and the creature Rahav in Hebrew mythology, God Ra and the dragon Apop in Egyptian mythology, etc.).
2. Chaos is always present as an internal aspect of order, which is always the

potential for new reorganization. This is the basis of the continuous change of the world. The new order is necessarily brought about by sacrifice (temporary death of a Hero or God). In self-organizing models, this sacrifice is like giving up the initial elements of some degrees of freedom for the birth of order. As a result of the victory of the God or the Hero, Chaos does not disappear completely, but the Otherworld, Tartarus, Aid, Leta, continues to remain in the form of an abyss into which the world can fall, until it is reborn again.

3. The process of the birth of order involves rearranging the elements of chaos, depriving them of the same (sex), not making them absolute or suppressing each other, but at the same time some basic components in harmonious proportions (male - female, active - passive, sky - earth, reasonable - unreasonable, in - yan, water - fire) occurs by dividing. From the perspective of antiquity, these proportions correspond to the golden mean. Changing any new order is associated with a violation of these proportions, a temporary loss of harmony, tension and suffering. Order in synergistic models is also born due to the violation of integrity in an initially unstructured environment, the emergence of differentiation characteristics in each element.
4. The birth of structure from chaos occurs through the emergence of local orders located around the centre, the source. Self-organization of source structures is a particularly large topic. In addition, the location of such structures is a characteristic feature of the self-organization procedure.
5. An ideal order can only exist in a local system protected from uncontrolled external influences. It is symmetrical and able to maintain its harmonious state for a long time. Order occurs as a boundary setting, a denial of uncontrollability. In mythology, the ideal form of order is associated with spheres and/or spherical objects. The earth is spherical, and all life on it moves in cycles. The egg, as a universal symbol of life, is an invariable element of all mythological systems, the basis of all beginnings. A mandala (a geometrical pattern of repeating elements in which sacred meaning is hidden in Buddhism) has a symmetrical, circular shape as an archetype of order. Synergistic schemas of world order describe the emergence of precisely such archetypal forms of cosmos and regard them as self-organizing.
6. The world exists in a cyclic exchange of dialectical categories such as Order and Chaos, homogeneity and heterogeneity, individuality and commonality, tension (conflict) and harmony. The seed of world order is born from the original disorder, on the one hand, through spontaneous restructuring, but on the other hand, through tension and difficult action. In such mythological themes, the spontaneous emergence of self-organizing structures, their procedural nature and tension, as well as the form of order in space and time, the presence of cyclicity are clearly noticeable.
7. These laws of the order of the world are universal, specific to the microcosm and macrocosm, the Cosmos, society and the inner world of man. Those who practice

synergetics often refer to holism, the idea of the indivisibility of the world (Rizaev, 2019).

Of course, if we take a closer look at the ideas of order and chaos in different mythological-cultural traditions, we will find not only many similarities and commonalities, but also many differences. For example, one of these differences is observed between Western (antique) and Eastern (especially Central Asian) traditions.

Philosopher M. Ergasheva observes the dependence of such ideas on the socio-formational factor on the one hand, and on the other hand the specific characteristics of Central Asia and Ancient culture, and points to their clearly defined and different dynamics. As we move from archaic to stately societies with developed tribal relationships, space and chaos seem to become increasingly distant from each other in the worldviews of these cultures. Chaos, which exists everywhere and at all times, is bounded by relations regulated by the world of order. "An exchange and transition between ambivalent chaos and space is established, they require each other and exist in a state of equilibrium." Later, as society moves through its formative phases, space becomes the dominant force. "... It is not chaos that creates and creates the cosmos, but rather all creative forces act on the side of the cosmos, to establish a more perfect cosmic order than in its particular existing state" (Ergasheva, 2015). In addition, Ergasheva relates the relationship between the universe and chaos to Central Asian and Ancient types of thinking, respectively. The self-organizing view of the world (requiring a relative balance of order and chaos in the dynamics of the universe) is much closer to the archaic than the modernist worldview, and more in line with the Eastern than the Western mentality.

The binary, linear formal logic that characterizes the logical dominant of the modern Western mind is the opposite of the non-linear self-organizing logic, which also opposes the logic of myth with multiplicity, multidimensionality, causality different from classical causality. G. Sultanova connects the logic of this myth with the logic of imagination: "In reality, the causal sequence is a temporal sequence. In the miraculous reality of myth, the sequence of causes may be outside of time. In order for something to happen, there is no need for any changes in certain previous circumstances" (Sultanova, 2019). Also, the concept of self-organization offers a completely different view of time and cause than that derived from the logic of linear thinking. "Current events are often connected with the past, and in fact, this situation depends on the fate of the future order" (Тыраев, 2015).

## Result and Discussion

Within the tradition of Western thought, the emergence of synergetics can be seen as a certain step of modern Western culture to the East, and modernity to the archaic, or rather, neo-archaic side. For example, the presence of such trends in modern Western culture, the modern philosopher and scientist X. It was shown by Samatov: "Today's new comes from the old and even from the oldest. The universe merges again into a world reminiscent of archaic syncretism, which does not know how to separate object

from subject, spirit from body, matter from mind, man from nature. This closeness is the communication of the new science with the ancient mystical and mystical teachings..." (Ulmasjonovich, 2021) was the starting point for One of the first to start it was the physicist Capra. In his time, the book "The Tao of Physics" brought him great fame. He proves that the picture of the world created by postclassical physics is very close to the ideas of all mystical, especially Eastern religious and philosophical systems - Hinduism, Buddhism, Taoism and Zen. In the third edition of The Tao of Physics, Capra formulates several criteria that distinguish the old paradigm from the new. The world is not just a structure assembled from separate elements, but a whole. The universe consists not of objects, but of processes, therefore knowledge proceeds not from part to whole, but from whole to part" (Ulmasjonovich, 2010).

True, the analogy with dialectics can be observed at the level of general ideas about the logic of the development of events, but not at the level of the whole set of ideas and results that synergetics offers.

While studying the historical roots of synergistic ideas, B. Rahmanov sees the presence of systematic synergistic motifs in many theories. He cites a long list of European philosophers who noted the existence of such motifs in his research: "These elements can also be found in the ideas of Pythagoras, Heraclitus, Empedocles, Aristotle, Plato, Socrates, Lucretius Kar, Plotinus and others" (Schütz, 2017). In our opinion, it can be significantly expanded.

Systemic-synergistic principle of universal unity and integrity in Europe D. Vico, I. It is reflected in the views of Herder, who noted the cyclical general pattern of birth and death. But the most mature ideas that are close to the systematic-synergistic perception of the universe and society are G. Leibniz, A. Schopenhauer, G. Hegel, K. Marx, G. Spencer, A. Bergson, Y. Heizinga, H.O. Gasset, O. Spengler, A. Toynbee, K. Jaspers, K. Popper. P. Related to the names of Sorokin and others.

Taking into account the perspective of the problem we have chosen, we should especially mention the researches of F. Nietzsche and all the philosophers who developed a program against enlightenment and rationalism in their time. This significantly changed the ideological orientations of Western culture in the XX century. Nietzsche was one of the first to draw attention to the excessive tendency of Western thought towards formal logic. He sees freedom from the yoke of the world in equalizing the rights of the Dionysian and Apollonian life principles, and compared to this synergistic view, it can be understood as a restoration of chaos, a recognition of its potential creative power.

In the list of names of Western philosophers and cultural scientists who are always associated with the ideas of synergetics, O. Spengler, A. Toynbee, K. Jaspers, P. Sorokin's cultural-cyclical theories should be mentioned separately. Cyclicity of world processes studied by synergetics, as a stable space and time structure formed by the laws of self-organization of cyclicity, researches of the above were carried out in relation to socio-cultural dynamics.

A synergistic attitude does not allow us to treat the universe and everything in it



with care, without understanding its hidden essence. Synergetics tries to return a person to the idea of the unity of the world, the inadequacy of dividing it into parts, the relevance of the analytical method.

A new unity is achieved through the emergence of a new logic of consciousness in European synergetics. He rigorously and reasonably tries to oppose the dichotomous, exclusionary logic of Aristotle's third. The rapprochement of Eastern and Western philosophies is one of the ideological implications of adopting a synergistic approach to the world.

Everyday life is another layer of human experience, which has its own logic of events and systems of knowledge. However, by everyday life we understand the world of everyday socio-cultural practices, not the non-divine world traditionally contrasted with the divine world. Through this, direct reproduction and change of socio-cultural reality is carried out. Foucault described this situation as "The pure practice of order and its modes of existence" (Foucault, 1983). called it. These practices have as their mental basis some semi-conscious image of reality. This is based on its non-linear character from our point of view, based on the non-linear logic of the development of events.

What does the logic of everyday life represent? Researchers on this issue have repeatedly focused on the ambivalence of everyday consciousness, which occurs at the level of any empirical sociological research (Попова, 2012). In such ambivalence there is not only a simple lack of information, but also a logic of feelings based on some holistic image of reality.

Everyday imaginations deal with time in a very special way. This model of time is far from the traditional formal logic, i.e. linear view of the development of life events, their correspondence to a consistent, cause-effect chain. The non-linearity of the daily time flow is the equifinality of synergetics (independence or low dependence of the current result on the initial positions in the past with a sufficient distance from the starting point of the process). corresponds to the principle. First of all, at the level of logical constructions, everyday consciousness is in many ways similar to mythological consciousness, which allows us to talk about the proximity of synergistic and everyday models of reality, the similarity of perceptions of the dynamics of everyday events established by such models.

## Conclusion

All of the above, from our point of view, leads to the conclusion about the significant integrative potential of the synergetic paradigm:

First, in its rules, one can see the foundations of interdisciplinary integration. "The main idea of the synergetic paradigm convinces of the inaccuracy of dividing the holistic knowledge of the world into fragmentary scientific subjects" (Alikulov, 2020).

Second, synergetics can be seen as the scientific goal of integrating different types of knowledge from different layers of human experience into a whole body of knowledge. Just as it connects mythology, philosophy, artistic fantasy, dreams,

everyday knowledge (Schütz, 2017).

Third, it can be a vector of cross-cultural integration that builds a bridge between the main philosophical and ideological positions of Western and Eastern culture.

Of course, these possibilities of synergistics can turn into another mythology in itself and turn out to be a failed project. But it follows from the content of synergetic ideas that the self-organizing dynamics of socio-cultural changes will continue along this path. Changes in mythological spaces are not a delusion, but a self-organizing aspect of the socio-cultural life of society.

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