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The fractal dimension of social space

The classic paradigm in the study of society in the XX–XXI centuries, began to lose its relevance in many of its provisions. It is found in many metaphysical, straightness, idealization and even lifeless. Classical social paradigm absorbed sound facility in the knowledge society and the world as a whole. But at the turn of 19–20 centuries in all fields of knowledge, both in the natural sciences, as well as humanitarian, discovered a whole new trend in the development, indicating a more complex functioning of the world of nature and society, the presence in it of factors such as relativity, subjectivity, irrationality, chance and even nepredelennost. Modern indeterministic position in the scientific world picture were enhanced appearance of fractal phenomenon that attribute in a complex non-linear objects, to which the society.

Key word: cognitive, scientific, social, fractal, paradigm, synergetic, reductionism, postmodernism, heterology, human.

Modern philosophy is on the new vector of development, which I think we should draw not like the round, involving a spiral of progressive development, but like everything you want. According to M.Mamardashvili, «the most difficult in the modern thought — is accustomed to see the world not like it is ready for understanding» [1; 58]. Indeed, the nowadays world requires significant rethinking and even a new thinking. In a fact, After the usual classical scientific and philosophical picture sometimes significantly losing its approved positions. In this regard, legally revert to the approval of M.Mamardashvili that «the evolution of philosophy happens when something is really broken in this conquered bliss, in this ontological rootedness of person. As a result, a person begins to feel that he has a deal with the world that almost eliminates the possibility of its understanding» [1; 59].

Since the second half of the twentieth century, the «fractal» term has appeared in the science, introduced by the American mathematician B.Mandelbrotom which was spread rapidly in various fields of knowledge: scientific and non-scientific, including the sphere of art (such as art installation, widely used by surrealists). The etymology of the concept of «fractal» comes from the Latin word «frangere» or «fractus» — break, break into pieces; fractional, broken, and its literal meaning — broken geometrical form or geometric shape composed of several parts, each of which is similar as the whole figure, that is composed of its small copies — thus it has the property of self-similarity.

Thus, the fractal is self-similarity, that consists of a small picture, the copy of itself and this is of great scientific and philosophical interest. Trying to divide the parts of the fractal (any size), we get a smaller copy of the original one. Russian philosopher Mikhail Epstein wrote in this case: «The question of what constitutes does cloud have, fractal theory answers: it consists of smaller clouds, which in turns consist of smaller clouds. What do the flames consist of? — The smallest parts of flames that is within themselves, sharing and decreasing, still aflame, and stuck out their tongue. As the modern science represents, the rocky coast, the mountain range, the fluctuating flame, the sea waves, the clouds, the snowflake, the colony of mold are fractal... fractal -is the dynamics of self-similarity, which is reproduced on different levels of its division or multiplication. And it's not a mathematical imagination is the only reliable way to describe the complex phenomena of our world — the rough, winding, devoid of that ideal smoothness, which is attributed by classic science» [2; 25].

Fractal principle is not an exception fir the humanities knowledge, because the whole world around us consists of a large number of small, tiny little world, reduced copies of the whole world, that obvious confirms once again the idea of the unity of the manifold, the ideas of the microcosm, first proposed by the ancient philosophers. The philosophical knowledge, called as postmodern philosophical discourse, the idea of fractal received the greatest relevance and viability. There is a geometric metaphor of the pyramid of life, the terms of the big number of small pyramids.

In the era of scientific and technological revolution the world has changed society in many ways — its quantitative changes such as acceleration of social time together with the expansion of social space from the dialectical inevitably led to tremendous qualitative transformation, contradictions. We are on the «threshold» of the completely new, unknown reality that beckons, triggering the alarm simultaneously.

Nature also socializes. Due to large-scale human activities, penetrated deep into its structure, the nature has changed. Now it is not the one that it was prior to humanity — pristine, untouched. It radically changed its relation with the quality of society. The unbiased confrontation of nature and society is mediated by a man, his influence on it. Nature acts like a humanized material, which is anthropomorphic, unlike myth-making becomes apparent reality. On the one hand, it is actively involved in the nature of human space, broadening the social reality in such way. However, under the pressure of a man it acquires its own history. And now that has changed, it completely in new way, unknown for us, affects at society. A prime example of the human dimension of nature is a big scientific discoveries XX – the XXI century as the surrogate motherhood, plastic surgery, creating GMOs, the creation of synthetic materials and others that, on the one hand, helps in solving many social problems, but on the other hand actively disturb to natural processes, the creation of 'humanised nature, the consequences of which completely undefined.

We live in a period of acceleration of social time, which led to a natural change in the social space. In addition, the trend of the maturing of the usual ratio of social time and space under the influence of a high level of development of information technologies (being here and now, we can communicate over a vast area, including past and future). XX and XXI Century has acquired a lot of epithets — «information society», «post-industrial society», «post-modern society», «postmodern society» — and represents a qualitatively and quantitatively new education compared to all known for us well-known in the history of mankind. In particular, the term «postmodern society» was entered by French poststructuralists (Derrida, Jean-F.Liotar, G.Deleuze, R.Barthes, etc.) as a symbol of the spiritual state of society, due to the fact that the collapse metanarratives culture («rules») that justify, organize the life of society and man. «Postindustrial society» — the term was proposed by D.Bell.This confirms the complexity of social life, the study of which is possible only by using the fractal thinking.

Any notion bears the stamp of the fractal. For example, in conjunction concepts of «heart» and «mind» every single term contains an element of another one — a clever heart and heart mind- and only because they represent the system in such way. It was very well written by Kazakh philosopher Abai in his work «Words of edification».

A particular example of a fractal is a man. The life of man — is a nonlinear system, the most nonlinear system of all existing ones. And this is because of the presence of the liberty of spirit, freedom and unpredictability of selection of thoughts, desires and actions. What is the extent of this freedom, what is the degree of skill to use it — and today the questions are sharp, open, burning in the philosophy of existentialism, philosophical of anthropology and postmodernism. By the way, Aristotle revealed this man's strange: since the birth of the ability to move, to think and to speak, person do not know how to use all of them and he has to developed these skills, that makes to do work out, logic and rhetoric.

There is no direct linear correspondence between the age of the human soul and biological age. It is clearly and definitely reflected in the age structure. At each moment of human life man consists of all of his ages, just as every age, too, goes through all other ages, includes them all. «That is the fractal structure of the person who responds to the fractal structure of the universe and may itself fatefully to be respond to it... The old age also has childhood... We have a maturity of old age... And there are old in old age» [2; 27].

Moreover, a person who is fully consistent with the measure of the same age and deprived of evidence of other ages is not real. «He wears his age like all right-fitting suit, under which there is not a living body, there is a plastic doll. Even-aged man — is a dummy, exhibited in the Museum of the imaginary human age» [2; 28]. Man is interesting and natural, when he is the bearer of all ages at the same time: in childhood, adolescence, youth, adulthood lurking signs of wisdom, and in adulthood the childishness, spontaneity and openness are not lost.

It is no coincidence that there are cognition the concept of «ontogeny» and «phylogeny» in social cognition, which mutually penetrate inside each other, representing the inseparable unity of ambivalence. Thus, the evolutionary development of mankind is considered by analogy with the evolution of the single body (hence, the ancient world of childhood is often called as humanity) and individual development of the organism assimilates the process of development of all mankind.

Fractal does not develop linearly. The dynamics of the self-similar fractal science explains by self-organization. Therefore, man as a fractal is a complex self-organizing system. In this sense, the fractal — is a transitional, quasi, potentially becoming the new state system, characterized by chaotic, unstable, which gradually changes, evolves to a stable, orderly unit. Hence the concept of a fractal is central in synergetics.

Our human intelligence is static, we perceive things around us as «instant photograph», as it has already been granted, not as a process of perpetual change. Sustainable immutable things — are the extreme state of

fractal. Moreover, almost all of nature consists of transitions from one state to another, of the processes. Heraclitus understood it, saying that «everything flows» (panta rei) and «you can't step twice into the same river». The concept of fractal, so should be a new methodology of all knowledge, particularly philosophical, when not only the processes in a laser, chemical reactions, but also a person, society, language, and thought — are fractals. It was in the XX–XXI centuries when the instability of society aggravated, when small, seemingly insignificant actions of individual people became led to catastrophic consequences for society (especially in the field of interethnic and interreligious relations).

A major role for the development of the theory of evolving systems to which the synergy with its concept of fractal philosophical and universal ideas of development played, self-similarity and the similarity of things to each other, the unity of diversity, non-equilibrium being, spirit being, other representations of the self. So, the idea of the universality Lao-tzu in ancient Chinese philosophy and Heraclitus in ancient Greek expressed, which later developed by Hegel, Darwin, Marx and many others. The idea of scaling all things in common which are laid seeds — homoeomerics suggested by Anaxagoras (all around), and Leibniz in the doctrine of monads. The idea of the unity of harmony and disharmony in the things that is being realized disequilibrium was in the doctrine of the Pythagoreans of irrational numbers. The idea of a spiritual base being developed by idealists and religious philosophers in the West and East.

Of chaos and order in the development of the world talked of Lao Tzu, Confucius, Heraclitus, Parmenides, Hegel in his doctrine of Nothing Shopengauer, Nietzsche, and many existentialists. Lao Tzu establishes the principle of non-action, following the Tao — the natural course of things. The Buddha calls for the median, warning of the dangers of absolute everything falling into extremes. The Russian Orthodox philosophy was known the philosophy of silence within the framework of the mystical teachings of Hesychasm.

Idea of the vector in the evolution of life (hence the description of schematic) of the definition of objectives in international development expressed by Aristotle, scholars, philosophers of the Renaissance, Fichte, Hegel, Marx, N.Fedorov, Vladimir Solovyov, V.Vernadsky.

If in the process of self-evolution of the system (which is undoubtedly true people) to identify the main stages of development, their 3: beginning, middle and end of the stage. Fractal is just average, the main stage of development as an unstable, transient.

Man as a fractal is a process, hence its elusiveness, ambiguity, incompleteness, distressed. If, for example, the nature and evolution of the animal at the time of birth can be set with a certain accuracy, a person is unpredictable and determine what its essence and what is its future impossible. This is based existentialism, asserting that human existence precedes his essence.

Starting with Heidegger receives the relevance of the mystery of human nature, as a secret not a particular object exists, but uncertain of the «background», which allows you to see things [3; 23].

In the XX century, the world finally losing quality solidity becomes mosaic, man increasingly difficult to associate themselves with a certain, stable system of external circumstances. The founder of philosophical anthropology of Max Scheler wrote: «The man has become fully problematic, when he no longer knows what he is, at the same time he also knows he does not know that» [4; 132]. This mosaic of human existence is certainly explained by rapid move scientific and technological revolution, with the fantastic — a short time radically altering both scientific and social space around the person. Farther and farther we move away from the book culture, appeals to the orderliness of certainty of human existence, to meet the unknown and invisible virtual screen in which a person is closed again, encrypted, undefined, ambiguous, multifaceted (try to decipher the sign, symbol). For the variety and diversity of mobile communication supernova lost the depth and truth of the real human communication that has long served as a means of recognition, recognition of the man himself and the other for himself. But what is it? Whimsy research time or a wish to escape from the reality of man, which he has long tried to conquer, but never found a way to do this? It may be that the virtual world — this is another trick of the universe, the illusion of freedom, peace, happiness, hope to find a genuine empty yourself, your identity? Or maybe a person and do not need the identity? Freedom? And this is another ghost? And maybe it is escape from freedom from Fromm? Questions ever-open...

Man is trying to give meaning, the meaning of human. According to Camus, the man is a problem for himself when asking himself the question about the meaning of his own existence, the boundaries of their existence, of the difference from their own kind, of all living beings.

Uncertainty person projected on society. Jean Baudrillard calls the modern society with their values based on the «principle of uncertainty» [5; 7]. In such a situation, that J.Habermas calls the «post-metaphysical pluralism» [6; 102], the formation of any moral and ethical values difficult. Hence it becomes clear relevance axiological aspect of uncertainty».

The problem of uncertainty, in addition, revealed through communication with such relevant areas of human knowledge, as the prediction and prognostics. Uncertainty clearest way finds himself in a probabilistic future openness which often creates a state of existential terror, «Future Shock» (Alvin Toffler) [7; 7]. In addition, many believe it is now, many cultures and civilizations are in a state of crisis, in the vicinity of the critical points of development. Uncertainty in these points becomes the maximum, which gives the issue a special urgency. There are uncertainties relationship with the phenomenon of marginality, as the ambiguous position of being-human is largely a consequence of this phenomenon.

And finally, one of the most pressing is the problem of the relation of uncertainty in human existence with freedom and necessity. For all currently existing ambiguous interpretation of freedom is the ability to determine their own existence is the first indicator of freedom. The uncertainty is arising in the implementation of existential possibilities, it plays an ambiguous role. On the one hand, she is able to significantly distort the very image of life, on the other hand, do not be uncertainty manifested in the human being as a probability, «fan» of possible paths from which the selection, there would be no freedom.

The uncertainty principle in social cognition, regardless of its status (ontological or epistemological) highlights the complexity of social cognition, tries to reflect the particular object and subject of the study, called the society and the people in the society, no doubt representing using synergetic terminology dissipative, complex fractal systems. Accelerating the pace of social development, globalization, the intensification of social interactions, social contradictions and conflicts further complicate the ability to adequately explain the complexity and uniqueness of the modern world and lay the traditions and styles of uncertainty, even undecidability in social philosophy. Moreover such traditions are not only a consequence of the above components and trends, but are also a methodological basis for their comprehension and understanding of the world to resolve the crisis. Thus, knowledge of man and society in the light of these problems, the further development of society and the extent of possible control its processes, the development of conceptual bases of social cognition timely and objectively determined. At first glance, the uncertainty principle inadvertently runs into the problem of determinacy or indeterminacy of social development, which makes it possible or impossible to social cognition in general. But this dilemma arises if you use a linear paradigm of social research. If you use other research paradigms, such as post-modern, in which there is no centering principle and single code, or scientific synergy, the uncertainty in social cognition as well as in social development clearly emerges as an indispensable attribute of them, without questioning and certainly not denying the importance and the ability of the social sciences themselves. And it's not just another ingenious paradox of human knowledge, and an indication of the specifics of the object and subject of social cognition — society and its media rights, which the comprehension of the essence and existence which not only reached its logical conclusion, as has acquired even greater uncertainty explicitly present in the modern era. This further convinces us in fractal human.

Man as a fractal is incomplete, it is in the eternal search process of becoming. Hence, the fact that the man was «ripped» from his own life. In accelerating the time he lives or past, yearning for it and calling it often «good», or the future, laying on a large bright hope. He does not live here now. All the time he is only willing to live. Therefore, the end perceives as a surprise.

Fractal of human is obvious, no doubt, but a synergistic type of thinking is needed. What does it mean to think Cooperate? The one thinks cooperate who understands that: 1. bytie — is not the finished structure of the universe, and the network of fractals — is a self-organization processes; 2. any complex system is open to the outside world; 3. The each system aims to attractor (sustainability); 4. Subject to the evolution of the main parameters of the order. The one thinks cooperate who thinks in dialogue; who thinks using the soft (flexible) thought forms; who remembers the eternal becoming, but does not forget that «all in one».

Fractal view of the world has led to the emergence of the philosophy of science of complexity and difficulty. Central of this development is the need to predict the behavior of systems that can't be accurately described, and modeling — for example, economic, social and natural.

Inherent classical philosophy the concept of «world view» creates the concept of «film world» as a living process of a change of scenery. Of the latter, non-standard attempts to overcome the crisis of knowledge can be identified:

- 1) the science of complexity, coming out of synergy;
- 2) spiritual science associated with the search for synthesis of science and religion;
- 3) rejection of the principle of reduction;
- 4) the rejection of the classical linear social paradigm...

For the complexity characteristic of infinite variety, incompleteness, uncertainty. Even between the animate and inanimate blurred the line. It did not become the world and the world of perpetual becoming.

Thus, in modern science and philosophy of cognitive problems found acute urgency and complexity. Kant posed the question about the possibilities of human knowledge remains open. With the emergence of the uncertainty principle in science and philosophy appeared postmodern temptation inflation truth. Despite the presence of the inevitable elements of uncertainty, chaos, there are certain limits of our penetration into the future, there is a horizon of our vision for the future. The question is about the change of cognitive paradigms, one of which was a synergistic paradigm to the concept of fractal thinking.

The discovery of the principle of synergy has made it possible to change the methodology of knowledge, both scientific and philosophical. Since the late 20th century synergetics was actively penetrate into the sphere of social sciences, and the synergetic paradigm today occupies an important place in the social sciences. Society — is complexly open system which, on the one hand, corresponds to a synergistic paradigm of research, on the other hand, it poses a problem. So, one of the pioneers of synergy, Ilya Prigogine pointed out the difficulties of application of social synergy to the study of social processes that explains the uncertainty of the parameters (such as «quality of life»); the need to consider «... pretty tough given the external environment with which the system in question exchanges of matter, energy and information»; the presence of a person «own projects» and «voluntarily» [8; 211].

Synergetics, therefore, is a new methodology, a new concept of knowledge, both natural and human, a new paradigm. That synergy is a paradigm of scientific research show: the presence in it of several divergent trends; philosophical treatment of its ideas; application and development of synergy is happening in a number of disciplines. In general, the concept of paradigm proposed American philosopher Thomas Kuhn in the mid-20th century. Based on the concept, synergies can be considered new paradigm of science. Synergetic Paradigm seeks to discover the whole knowledge of its facilities, find their unity, so its appearance is one of the progressive stages of the development of science.

More philosophy applies concepts of instability, bifurcation, nonlinear. Synergetics claims to act like a new world, radically changed the understanding of necessity and chance in the world and society. Under the new methodology investigated the forms and causes of social processes. There is a new understanding of the case as an independent factor of social evolution and its role in public self-organizing processes. It turns out that the society and people of fractal organized, which corresponds to a synergistic paradigm.

Not knowing what awaits us in the future, we are already seeing a lot of unusual, fascinating and frightening at the same time we have the phenomena of paradoxes in nearly all areas of the world around us and present in our reality. This finding with the discovery of the theory of relativity multilayered, ambiguous, multi-level nature, new, unknown to science anomalous and paranormal, sometimes mystical phenomena in man that firsthand indicates unexplored mysteries of the human mind and the world as a unit.

XX and XXI century exposed the complexity of the universe in general, and social life in particular. Modern man is in a state of confusion, helplessness before challenging the unknown. How did he navigate the complex, contradictory and uncertain world? Where are the limits of certainty and uncertainty of complex systems concept? What is difficult to understand? Each of us affects the situation of waiting and looking into the future. How to prevent a social crisis, as the lead society on the path of the progress of civilization? You must be able to understand the laws of self-organization, which operates a complex system. «An important role is played here by the chaos,» free will «disorderly behavior at the micro level, leading to the emergence of macro-level dissipative (non-equilibrium open) processes. That dissipative processes combined system components into a single unit, promote common development. This — the transfer of information, human migration, this spread of disease and market relations. Without these events, each part of the system is closed on itself, from the general structure» [9; 89].

The dynamics of civilization so great that at the time of acute perfect, seemingly minor accident lead to unpredictable macro-consequences. For example, a group of terrorists could pose a threat to the existence of human world.

To this end, humanity must be able to apply the principle of co-evolution of complex systems, know the laws of their joint global development. On the first place, we must move away from the «homogenization» of the principle of equalization. Structure totally different levels of development can come together into one complex.

Sociologists therefore proposes to raise the level of non-linearity of the medium, its degree of complexity. «This kind of» environmental education «is also often found in self-organizing systems. Is this not how people are doing every day, raising their children? If we compare the brain child of tabula rasa, a blank page,

the education is not merely filling her knowledge and skills, but above all the improvement of the material to this page so that it is self-sufficient could give rise to ideas and concepts, to build on its model of internal environment and surrounding the world» [9; 90].

But most of all we must think about radical change in human civilization itself. In the information society, which was formed in the last decade, and fundamental change in the relationship between people. In place of the pair interactions come collective, and thanks to modern scientific and technical means of communicative in these relationships include a huge mass of people. This further increases the scale of the non-linearity of the medium, the level of complexity of society, social relations and relations. I think that knowledge and skillful application of the laws of self-development of dissipative systems, the principles of their co-evolution, self-creation based on these complex structures will allow to develop a new positive approach to solving global problems facing our modern science and in general to human civilization.

In the West in recent years, a new direction was found, called «complexity science» (science of complexity). It is yet an interdisciplinary direction and consists of a collection of different techniques, philosophical views, intellectual discourses, metaphors in order to study complex systems. The main objective of this line — to be able to predict the trends of development of those systems that do not lend themselves to precise unique description, which, no doubt, include, for example, natural, social and economic systems.

Our future is open and diverse, but it is not arbitrary, or social cognition a priori, it would be meaningless, that does not correspond to the facts. There are a number of future development opportunities. This range is determined mainly by its own properties.

Fractal concept as the post-classical, on the one hand, is opposed to reductionism as an attribute of classical linear research paradigms. But on the other hand, reductionism — is a priori property of the human mind, making out anthropic human knowledge, and therefore gives an approximate reflection of reality (by the way, Euclidean geometry is an example of reductionism). As for the study of synergetic paradigm, claiming to fractal theory, it inscribes the latest mathematical representations associated with the names of mathematicians Cantor Koch Mandelbrot managed to explore the complex, non-linear structure (Mandelbrot was able to measure the length of coastlines). Nevertheless, it seems that it is the same reductionism, complicated indeed, but still offers the tough rationalization, schematization, mathematization in the study of any processes.

But whether is this the essence of the fractal paradigm?

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Б.Ж.Жүсіпова

Әлеуметтік кеңістіктің фракталдық өлшенуі

Мақалада XX–XXI ғғ. қоғамды зерттеу классикалық парадигмасы өзінің өзектілігін көптеген салаларда жоғалтуда. Оның сипаттамасы метафизикалық, бірқалыпты, идеалистік және жансыз деп айтуға болады. Классикалық әлеуметтік парадигма әлемді және қоғамды танып білуде рационалды көзқарастар орнатты. Автор XIX–XX ғғ. білімнің барлық салаларында, жаратылыстану және гуманитарлық, жаңа тенденциялар байқалатындығы жайлы айтты. Бұл табиғаттың және қоғамның күрделі функционалдығы, ондағы релятивтігі, субъективтігі, иррационалдығы, кездейсоқтығы және белгісіздігі деп ойлаймыз. Қазіргі әлемнің ғылыми бейнесі индетерминистік позициясы фракталдық феномен арқылы күрделі сызықтық емес қоғам сияқты объектілер арқылы күшке ие екендігі дәлелденген.

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Фрактальное измерение социального пространства

В статье отмечено, что классическая парадигма в исследовании социума в XX–XXI вв. стала терять свою актуальность во многих своих положениях. Она обнаружила во многом метафизичность, прямолинейность, идеализацию и даже безжизненность. Классическая социальная парадигма, подчеркивает автор, впитала в себя рациональные установки в познании общества и мира в целом, но на рубеже XX–XXI вв. во всех сферах знаний, как в естественно-научной, так и гуманитарной, обнаружились совершенно новые тенденции в развитии, что свидетельствовало о более сложном функционировании мира природы и общества, о наличии в нем таких факторов, как релятивность, субъективизм, иррационализм, случайность и даже неопределенность. Выделено, что современные индетерминистские позиции в научной картине мира были усилены появлением феномена фрактальности, который атрибутивно присущ сложным нелинейным объектам, к которым относится социум.

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