

## **SOCIAL SYSTEMS AND METHODOLOGY FOR FORECASTING THEIR FUTURE STATES**

Determination of the contours of the future in the era of accelerating global social changes assumes that there is an overtly or implicitly accepted social forecasting methodology. It is expedient to explicate it and reflect on it.

It's important to single out two components of such a methodology. First, this is the idea of the structure and dynamics of the society. It is represented within the framework of the scientific approach by a contemporary version of the picture of social reality as a special form of scientific knowledge that introduces systemic and structural vision of the subject of research by social sciences and the humanities. Second, this is the contemporary systems analysis concept that emphasizes revealing special features of complex self-developing systems.

The society is viewed in the contemporary scientific picture of the world as a whole, complex, historically developing organism, reproduction and changes of which are determined by interaction of its main subsystems – economy, the subsystem of social relations in big and small social groups, culture.

Culture plays a special role here. It appears in the contemporary understanding as a complexly organized and developing system of suprabiotic programs for human vital activities – activities, behaviour and communications of people. Worldview universals (concepts, categories) of culture are their system-forming basis: “man”, “activity”, “nature”, “individual”, “rationality”, “power”, “traditions and innovations”, “good and evil”, “faith”, “hope”, “love”, etc. The meanings of the worldview universals are presented like fundamental life orientation points and are felt by people as the basic values. They function in the life of the society similarly to genes in biological organisms, forming a kind of genome of social life in their connections. And as origination of new biological species is impossible without genome's transformation, radical changes of social organisms are impossible without transformation of their cultural-genetic code,

represented by fundamental values, the meanings of worldview universals of culture.

Hence analysis of the value foundations of the society and their changes is the main and determining factor in forecasting the future, if we are speaking about radical changes and turning points in the society's development.

Economy and development of productive forces as a result of technological innovations are viewed in the Marxist concept of the society as the generator of social changes.

The contradiction between the new level of productive forces and the established previously production relations, originating in the process of this development, leads to their change, transformation of the established macrostructure of the society (relations between classes, social groups, castes) and origination of a new socioeconomic formation as a special kind of a social organism.

Many real characteristics of societies' evolution are expressed in this picture of social changes. But if we analyze in more details the process of new production relations and transformation of the society's macrostructure, we find out that this process assumes the change of the status of values that dominated previously and formation of new value orientation points, new meanings of worldview universals. And until they are not known to the mass consciousness as the foundations of the new picture of the lifeworld, the period of instabilities, contradictions, collisions of various social forces will go on. Spiritual revolutions always precede political revolutions, changing the macrostructure of the society and its social institutions.

It's not enough to review only the arrangement and changes of the economic life to understand, explain and foresee social transformations, cardinally changing the type of the society. It's required to understand the economic life itself from the point of view of the domineering cultural-genetic codes, representing basic values of respective types of the society.

The society as one whole organism, the natural environment (biosphere), in which it is submerged and with which it directly interacts, the society's subsystems

(economy, social sphere, culture) are complex self-developing systems. Forecasting the future supposes finding out the special features of such systems' functioning and development.

A number of structural special features of developing systems were fixed in Hegel's philosophy. K. Marx developed Hegel's ideas and worked methodological principles for analysis of complex objects and demonstrated the efficiency of this approach when researching the process of origination of commodity-and-money relations, the following money transfer into capital and establishment of capitalism.

The following steps in research of the self-development systems' special features were already made in the science of the 20<sup>th</sup> century: formation of quantum and relativistic physics and cosmology, creation of genetics, systemic ideas in Earth sciences (V. I. Vernadsky), development of cybernetics, dynamics of nonequilibrium systems and synergetics, the theory of information and semiotics. All that provided a lot of various materials for systemic generalizations, allowing to single out essential characteristics of complex developing systems (natural, social and mental).

Complex self-developing systems are characterized by hierarchic arrangement of elements. All these systems are open to the environment. They exchange the matter, energy and information with it. Each system of this kind is reproduced according to self-regulation programs in sustainable states in the process of this exchange. But these programs feel the disturbing impacts of the environment all the time and can mutate under such impacts. In this case the system enters the stage of qualitative changes (phase transition).

Philosophy characterizes such stages as a jump, a break of gradualness in development, as transition of quantitative changes into qualitative changes, transformation of a possibility into reality. These general characteristics in contemporary science are rendered concrete when they are described in the synergetics language. In this case, phase transitions are described integrally as

origination of dynamic chaos, bifurcation points, formation of possible development scenarios, action of cooperative effects and escalation modes.

Basing on these ideas, new steps are possible in description of phase transitions, presenting their integral characteristics differentially, in “time scanning” of the process of the developing system’s qualitative changes.

I suggested to single out three stages inside phase transition, replacing each other in time, in my papers in recent years, including in my report at the previous XVII International Lihachov Scientific Conference.

The first stage is characterized by origination of dynamic chaos in the environment when preceding order indicators and respective self-regulation programs stop providing reproduction of the complex system in the sustainable state. Bifurcation points and a range of possible scenarios for the system’s development originate. These scenarios in the synergetics language are characterized as attractors in the nonlinear medium. Their numbers are not unlimited; they include only those scenarios that are not in contradiction with the established objective laws. Realization of any of these scenarios is determined by probable causality, it depends on numerous accidental factors. Because of that even the least probable scenario may be realized.

Competition of scenarios at the second stage of phase transition may single out some of them as domineering, outlining the mainstream development. In this case original probabilities of each scenario change. When one of them starts determining the course of the system’s change, the probability of the others’ realization abruptly decreases.

Surely, this does not exclude the possibility of a disastrous scenario as the mainstream development, the one that may lead to simplification and destruction of the system. But if the scenario providing the rising development trend becomes the domineering scenario, a kind of purposeful movement of the system to the new level of arrangement originates. The target-oriented causality starts playing the main role here.

Formation of the new level of the system's arrangement at the final stage of phase transition provides a retroactive effect on the previously formed levels, transforms them, imposing certain restrictions on the operation of their laws. As a result, a new wholeness of the more sophisticated system is formed as well as new programs for its self-regulation and respective order indicators.

Transformations of this kind are the most important component of complex self-developing systems' evolution.

It's possible to give a lot of examples of such transformations applied to natural, social and mental systems.

One of such examples is the regulative role of culture in relation to human behavioural biogenetic programs. Culture as the system of suprabiotic programs for human activities, behaviour and communications does not eliminate the instinctive behaviour laws (feeding instinct, instinct of self-preservation, sexual instinct) but has a regulative impact on them, forming respective traditions, customs, social standards (including moral and legal regulators) that determine the framework of instinctive behaviour admissible in this or that society.

Synergetics still has not fully mastered the special features of this transformation process in case of previously formed levels of a complex system under the impact of originating new levels. Nevertheless, it was fixed phenomenologically within the framework of integral phase transitions' description that the future influences the past in escalation modes (works by S. P. Kurdyumov). This statement looks unusual and even irrational from the outside. But if we take into account that the past is fixed in the structural levels of the system that originated previously, the future's impact on the past is fairly rationally explained. The explanation reflects the principle according to which the condition for the system's wholeness restoration in case of its complication is transformation of the previously originated levels under the impact of a new level.

All these special features should be taken into account when forecasting the future of social systems. If we are speaking about the stages when a social system is relatively stable, forecasting its future may be based on finding out the self-

regulation program and prolongation of the established trends of the system's changes. But forecasts of such kind are already not working if the system enters the phase transition state. In this case it's principally important to determine at which stage of this transition the system is and what type of causal links is the basis for forecasting its future.

Transformations of the society at the phase transition stage may be of different deepness. The deepest qualitative transformations of the society that determine its future evolution often for many centuries, take place when there is transition to a new type of civilization development.

There were two such transitions in the history of the humankind – 1) from archaic societies to civilizations of the traditional type; 2) establishment of the technology-related type of civilization development that originated in Europe and then spread all over the globe.

There are a lot of grounds to think that contemporary global changes and accompanying them crises are the original stage of transition to a new type of civilization development, the third in relation to traditional and technology-related types.

The value matrix (meanings of the universals of culture) is transformed and new value orientation points are formed in case the type of civilization development changes. They form the nucleus of the genetic code of the societies realizing the respective development type. This nucleus in each of such societies is connected with the type's specific features, expressing the historical features of culture of this or that kind of society (civilization).

I have already emphasized in my papers and not once that there are growth points of new values originating in the contemporary technology-related culture, and they serve a forerunner and prerequisite of transition to a new type of civilization development.

Here it's possible to single out two clusters of values. The first of them is referred to understanding human attitude to nature. The image of nature as a field for transforming activities and bottomless reservoir of resources, the idea of man's

dominance over nature was the most important component of the spiritual matrix of technology-related cultures. They served as the deep-laid value foundation for economic development strategies, including the modern versions in the societies of consumption.

But other ideas of nature and human activities were worded in the course of science's development, already in the 20<sup>th</sup> century. It turned out that the natural environment, with which humans directly interact, is a one whole live organism, global ecosystem, biosphere. Human productive activities have a growing impact on it, and that may lead to local and then global environmental crises.

Philosophical ideas of Russian cosmism, development of the biosphere and noosphere concept by V. I. Vernadsky, ideas of the Club of Rome about the limits of growth, environmental ethics concepts (B. Callicott, L. White, R. Attfield) and critical analysis by Ervin László already in this century of the main principles of the economy's of the societies of consumption arrangement made a considerable contribution into the development of these ideas, and the conclusion that these principles ("the more we consume, the better we live", "each generation solves its problems itself") orientate to consumption of natural resources in expanding scales, and that in its turn leads to increasing pollution of the environment and environmental catastrophe.

The ideal of man's dominance over nature was transformed into the ideal of coevolution of man and nature as a generalization of all those ideas.

The second cluster of new values arising in bifurcation points of technology-related culture is connected with the problems of scientific and technological progress.

It has always been the core of changes in social life in the technology-related type of development.

Complex self-development systems are becoming the main objects of the breakthrough scientific research and technologies. The special place among them is occupied by man-sized systems, including humans as their component. The examples of such systems are biosphere, biogeocenoses, all social objects in their

development, the objects of today's convergent NBIC technologies (nano-, bio-, information and cognitive technologies).

The activities with complex developing systems have their special features. They are not just a purely external factor in relation to the system, but are included in it, actualizing some development scenarios and reducing the probability of others.

When researching self-developing systems, there is always the problem of their development scenarios' analysis, arising at the phase transitions stage. There may be unfavourable scenarios among them, and even disastrous for humans. It's necessary to analyze and assess them.

This task is solved in the process of socio-ethical expert examination of scientific and technological programs and projects. The efficiency of such an expert examination depends to a large extent on the use of achievements of social sciences and the humanities in it. These sciences in the process of research and technological mastering of complex systems actively interact with natural and technical sciences, forming interdisciplinary complexes of knowledge, required for solution of certain research and practical tasks.

In the near future, the humankind mastering convergent technologies will run across new problems, the solution of which will require the new level of social and humanitarian scientific research. Robotics and application of information technologies set the task to change educational and training strategies. Questions arise as to how to restructure educational processes, how to arrange upbringing of the new generation from childhood.

The problems of human consciousness formation in the context of changes of culture should be comprehended as determining all other spheres of human vital activities. And that comprehension is impossible without a build-up of the potential of social sciences and the humanities.

In this connection it is appropriate to remember the statement by the famous ethnologist and expert in cultural studies Clause Lévi-Strauss: "The 21<sup>st</sup> century will be the century of social sciences and the humanities, or it won't be at all".