SCIENTIFIC LIFE

**A Vector of Research: Cybernetics of the Third Order**

**(Report on an International Interdisciplinary Scientific-Practical Symposium)**

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On October 16-17, 2017, the XI International Interdisciplinary Scientific and Practical Symposium *Reflexive Processes and Management* was held at the Institute of Philosophy of the Russian Academy of Sciences. The representatives of a number of RAS institutes, some Russian and international associations, as well as a dozen scientists from many cities of Russia and abroad took part in it. During the discussion a general vector for the symposium participants was found, i.e. of a new approach to the problems of the philosophical foundations of the theory and practice of modern management. This vector is related to the subjects of social and humanitarian technologies, reliance on reflexive processes and cybernetics of the third order connected with self-developing reflexively active media.

Welcoming the participants of the symposium, the Member of the Russian Academy of Sciences, Deputy President of the RAS V.V. Ivanov stressed: it would seem that the statement *“economics for a man, not a man for the economics”* is just a paraphrase of the evangelical statement *"Saturday for a Man, but not a Man for the Saturday" is* a kind of ethical matrix which was extremely overcomplicated. It involves two mental streams: the most complicated and thorough analysis of modern economic development, on the one hand, and basic ethical humanistic values, on the other hand. If basic values are not taken into account, the result can be a cost-effective but destructive technological hell for mankind.

According to V.V. Ivanov, development of the future society by improving the human environment only technologically is impossible without taking into account of a wide range of ethical humanitarian values. It is time to choose a new social - humanitarian vector of technological and economic development. This vector requires not only *announcing* it, as the leaders of scientific communism or apologists of “humanized” technocracy did in the past, but *calculating it.* At the same time one cannot fall into purely quantitative determinism and ignore the qualities and properties of a person. It is necessary to focus on qualitative methods as well. Some theoretical research in this direction was carried out by the scientists of post-industrialism, e.g. by D. Bell (capitalism variant) and I.T. Frolov (socialism variant). Today we must also take into account new realities, in particular, those related to the digital economy. V.V. Ivanov reasonably shows that modern post-industrialism is determined by the ecological aspects of technologies, as well as *preserving the historical and cultural environment* (according to the Academician D.S. Likhachev) which are not less important than the projects of technogenic civilization balanced development and preservation of the natural environment. Thus, the global humanitarian - technological revolution as an innovative paradigm of the 21st century will become a real task, the solution of which will ensure the development of the mankind.

The member of the RAS N.I. Lapin (the Institute of Philosophy of the Russian Academy of Sciences) concentrated on the development problems of Russia, presenting an analysis of the reasons blocking this development. Given the purpose of the symposium to discuss the key problems of cybernetics evolution, he singles out the necessity of analyzing the differences between models of self-regulation and self-development, stressing that cybernetics of the third order is powerful enough to assess the society as a whole.

G.G. Malinetsky (MV Keldysh Institute for Applied Mathematics) presents his own version of the image of a post-industrial world in which *two* out of a *hundred* people are feeding everyone, *ten* are engaged in the industrial production, *thirteen* are in management and in the service sector. What are the other *seventy-five* people doing? There are different answers to this question, but it is clear that without an image of a “*desirable future*” such answers can be socially destructive, even self-destructive, and some traces of this are found already today. It is possible to avoid destructive consequences, observing the imperatives of the various *“worlds”* that make up the mankind. As for the imperatives of the **“world of Russia”,** they are as follows: *the spiritual is higher than the material, the general is higher than the personal, justice is above the law, the future is higher than the present and the past*. The speaker, being a mathematician, does not only declare, but proves the importance of these imperatives for the **whole mankind** and *calculates losses* in connection with ignoring them. These imperatives are distorted in the course of *financial, informational and even cognitive wars* against Russia (so far, unfortunately, quite successful). The way out offered by G.G. Malinetskim is a call to stick to the course for **a dream** that seems at the first glance to be *ultra paradoxical for a mathematician*. Nevertheless, this paradox is transformed into productive dialecticism while analyzing the already implemented **Space Project** and similar “*tasks for tomorrow*”. In the course of their implementation, the “world of Russia” is able to set development goals for other “worlds” that make up mankind.

To continue this line, V.E. Lepsky (Institute of Philosophy RAS), the organizer of the symposium, discussed new aspects of assembling subjects of development. It was stressed that such an assembly is optimized in self-developing reflexive active environments, the creation of which not only promises to overcome the national development crisis of Russia, but also sets development goals for the mankind in general. The foundation of the assemblage of development subjects should be motivated from inside, not set or imposed from outside the community, on the basic of genuine values and a set of goals, formed during the project identification of Russia and the productive activity based on it. Only such environments provide the possibility to solve problems of complexity (one might even say complicating complications) by the self-development mechanism through the harmony of hierarchical and network models. At the same time, “severe globalization” is being replaced by a synergistic poly - subjective reality, linking the socio-cultural diversity of the mankind. Solving the above mentioned problems, the scientific community of Russia can restore leadership positions in management theories, the high quality of which allowed launching the Space Project, which was significant for the development of the whole mankind. Poly - subject environments within the framework of the *state-society-business structure* are oriented towards socially responsible production, leading to the creation of the next, more effective control circuit, in comparison with the established one.

It is important to stress that the key tool in the assembly process should be cybernetics of the third order. If cybernetics of the first order could be compared with a point, the second one with a line, the cybernetics of the third order acts as a three-dimensional space providing a comprehensive development of human potential. Its outlines are now being specified by the developers of the VII socio-humanitarian technological order. The new cybernetics is oriented towards creating mechanisms of management adequate to human nature through development, to overcome its lack of subjectivity. The cybernetics of self-developing environments, due to the newly acquired and highly productive subjects, are already working on the basis of the reflexively active media, though not yet to a full extent.

The methodological foundations of cybernetics of the third order are based on the ideas of the academicians of the Russian Academy of Sciences V.S. Stepin and V.A. Lectorsky. The post-nonclassical type of scientific rationality made it possible to build cybernetics where the subject, or the subjects to be exact, with the development environments they produce, are equal participants in management processes, setting the prerequisites for and fixing the “human-size” results. This cybernetics is not so much within the *framework* of management, as in the *stream* of management, where it can be given convergent and divergent directions, control as a plastic current.

Stuart Umpleby (Washington University, USA), President of the International Academy for Systems and Cybernetic Sciences), stated that the effective search for theoretical foundations and practical provisions of third-order cybernetics were a subject of recent scientific events. During a meeting in Rome in January 2017 of the World Organization of Systems and Cybernetics it was stated that the research of the Russian scientists in this direction, first of all of V.E. Lepskiy, demonstrates fundamental differences in the philosophical foundations of the Western and Russian approaches, which stimulated joint discussions. Russian researchers support the ideas of Russian scientists, who focused on the significance of the human being, up to the scale of the Universe. These ideas are similar to the ideas of the great Western philosophers, such as Locke, Voltaire and Rousseau. While reading them carefully, it turns out that they also put the person at the center of their attention. The main themes of discussion for both Russian and foreign scientists are the problems of managing complexity, the role and the place of the observer with inherent basic values, assembling the subjects of development, improving democracy, etc.

T.A. Medvedeva (Siberian State Transport University, Novosibirsk) analyzed the differences in the approaches of Stuart Umpleby on second-order cybernetics and V.E. Lepskiy on cybernetics of the third order. Much closer integration of these approaches through cooperation is justified and welcomed.

Igor Perko, Director General of the World Organization of Systems and Cybernetics and professor at the University of Maribor, Slovenia, took an active part in the discussion of the philosophical foundations of promising directions for the development of cybernetics. He encouraged coordinating the research of the Russian and Western scientists and suggested that the Institute of Philosophy of the Russian Academy of Sciences could hold the next World Congress WOSC in Moscow in 2020. His suggestion was accepted and submitted to the authorities of the Institute for consideration.

A.A. Zatsarinny (FIC "Informatics and Management" RAS) and N.I. Ilyin (Federal Security Service of the Russian Federation) described the national system of distributed situation centers, having examined the directions of its development on the basis of social and humanitarian technologies. They analyzed the functional evolution of the centers: from supporting decision-making processes and providing cognitive procedures to aid accelerated development. It is important to note that the methods for integrating the centers are based on the methodology of self-developing reflexively active media and the third-order cybernetics.

S.N. Sylvestrov (Financial University under the Government of the Russian Federation) described the principles of the work of distributed situational centers in the economy, a significant management innovation that contains a powerful component of reflexivity. An important stage in innovation introduction is the development of high-tech inter-agency platforms that create a set of specialized services. The experience of such platforms in the field of managing the development of the modern space industry has already demonstrated their high productivity.

A.N. Raikov (Institute of Philosophy of the Russian Academy of Sciences) suggested using the potential of the philosophical concept “*monad*” in self-developing media, adjusted to the specifics of such media. This concept indicates the importance of the procedure of reflexive information encapsulation regarding the behavior of the subject. The concept of the "convergent monad" introduced by the author allows us to cover and fix vague (difficult) elements of cognitive and reflexive procedures that ensure the effectiveness of decision - making.

The member of RAS D.A. Novikov (Institute for Control Sciences of the Russian Academy of Sciences) offered his own vision of the prospects for the management development and the cybernetics, emphasizing the growing role of reflexive processes analysis in the vectors development.

S.V. Pirozhkova (Institute of Philosophy of the Russian Academy of Sciences) characterized the changes in the forecast strategy in the transition from simple research to the study of increasingly complex systems and, accordingly, from the classical to the non-and post-non-classical type of scientific rationality. These changes lead, among other things, to the formation of such practices as working with the social future, such as foresight, which integrates a projected and planned project, as well as the reflective and socially-projective components. The latter can be implemented in a manipulative way, however, the strategy of the “round table” is the most effective both in the cognitive (prognostic) and in the transformative (planned) aspect. S.V. Pirozhkova shows that this strategy corresponds to the model of the poly - subject reflexivity of the active environment and the concept of a collective subject of cognition. The latter reveals the epistemological measurement of foresight and the assembly of developing subjects as collective cognitive units.

I.E. Zadorozhnyuk and V.M. Kalashnik (National Research Nuclear University “MEPhI”) stressed that the Russian reflexologists keep in mind the problems of education organization at all levels. This is not of surprise: education and upbringing are reflexive by their very nature. Very often the educator perceives the produced knowledge in a new way, transferring it to the learner, framing it in accordance with the possibilities and methods of assimilating the material. This task leads to the means restructuring, for example, associated with a higher level of computer literacy of the students. As a result the influence on the educational process is quite positive. Education at all levels is a constantly developing process that ensures national identity, cultural continuity, and human development through building up human capital. The speakers point out a paradox: the graduates of the Russian universities are extremely successful in the science and education in foreign countries, particularly, in English-speaking countries while the rating of Russian universities is being placed in the lowest hundreds. The situation is slowly changing, but the ratings should reflect the realities more accurately. The introduction of the Moscow international rating of universities “Three Missions of the University” obviously will improve the situation. It will create a genuine, and not an “information-imperialist” competitive environment in the ranking of universities.

After the main reports the Round - Table on Reflexive Technologies in Information Wars (from Confrontation to Strategic Partnership) was held where the experts from the Military Academy of the General Staff of the RF Armed Forces and the Academy of Military Sciences took an active part. It also was a kind of link to the conference “Analytics of development, security and cooperation: Greater Eurasia – 2030” planned for late November 2017. The reports at the symposium set some directions for the conference which was to take place at the Public Chamber of the Russian Federation. This form of discussion can be considered a way of innovating and brainstorming for the future development: at first, the problems are discussed by a relatively narrow circle of experts, including international ones, and then they are brought to wider forums of scientific and practical participants.

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