CYBERNETICS AND THE RUSSIAN INTELLECTUAL TRADITION

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Abstract

Difficulties with implementing market reforms have increased interest in understanding the unique Russian philosophical heritage with the goal of understanding what Russian civilization is and what the similarities and differences are between Russia and the West. Such thinking necessarily requires us "to look at the root" of the problem: to see the similarities and differences in the Russian and Western intellectual traditions, to try to determine not the geographical, but the intellectual place of Russia between the East and the West. Such attempts are particularly valuable when they lead to ways of integrating Western and Eastern intellectual traditions, in order to solve global problems. Such integration is needed at this time in history. The Russian style of scientific thinking, due to its history and culture, includes elements of Eastern and Western thought. The Russian intellectual experience may provide the basis for a synthesis of Western and Eastern knowledge.
This paper describes the Russian intellectual tradition from two perspectives. First, it describes the peculiarities of the Russian style of scientific thinking in comparison with Western and Eastern approaches. Second, it suggests that cybernetics as "the most Eastern of the Western sciences" may benefit from such ideas as the noosphere, the necessity to develop man's nature, Russian cosmism, active evolution and tektology.

Key words: intellectual traditions, history of science, second order cybernetics, Russian cosmism, active evolution, tektology

Introduction

In the 1930s British psychologist Frederic Bartlett experimented looked for a new method of studying human memory. He was convinced that memory was a social and cultural phenomenon. After a series of experiments he discovered that “educated subjects are likely to understand and remember astonishingly little of any scientific subject concerning which they have been given no specialized training. Here … statements are promptly converted into their opposite, the title disappears, proper names are changed. Between the original and the final reproduction there is no obvious link of connection.” (Bartlett, 1932)

Bartlett’s experimental subjects were asked to transform an original text into something more comprehensible to them. “They retained the details that made sense to them and omitted or distorted everything else. From his experiments with “Russian Scandals”, Bartlett concluded that **remembering was determined by “schemes”, or cultural patterns characteristic of a larger social group**.” [What is a “Russian scandals”?]

It seems that knowledge has a cultural foundation. The way that knowledge is created and communicated is different in different societies. So, we should not be surprised to find that the

implementations of scientific ideas differ from one country to another. For example, different interpretations of fundamental ideas can be clearly illustrated by the American and Russian development of I.P. Pavlov's idea of the "conditioned reflex". Pavlov discovered a conditioned reflex while experimenting with animals as a physiologist. Later he learned that American psychologists were experimenting in the same way. He wrote about the difference between his work and the American work by noting that the
practical American mind found it more important to know the *external* behavior of a man, than to guess about his *internal* state. [Yaroshevsky, 1996] However, the Russian psychological tradition is to aspire to understand the human soul in order to make people better. Western behavioral science has a completely different aim: to understand behavior in order to make people more successful. Using the formula "stimulus-responce" behaviorism cultivated onlyindividualistic values and ignored any values except personal success. It provided the means to manipulate other people and to be a winner. The American science of behavior teaches us *to act in the right (instrumentally successful) way*. Russian psychology teaches us *to make right (ethical) actions*.
Can there be a difference of opinion on what is right? Who decides what is right -- on individual or a person in authority?
The Russian style of scientific thinking, due to its history and culture, includes elements of Eastern and Western intellectual traditions. Characterizing the Russian intellectual tradition in comparison with the Western intellectual tradition requires emphasizing many facets. There are fundamental differences. It is widely recognized that what we see depends on how we look.

Table 1
The Russian intellectual tradition in comparison with Western and Eastern approaches

Eastern intellectual tradition	**Russian intellectual tradition**	**Western intellectual tradition**
	Logic	
Logic of metaphors	Logic of ethics «Dostoevsky has fantastic words suggesting that if on one side there would be truth, but on the other side there would be Christ, it would be better to reject truth and follow Christ, e.g. to sacrifice the dead truth of a passive intellect in favor of having truth of an integrated spirit.». N.A. Berdyaev Acceptance of irrationality	Logic of actions Emphasis on reason
	Culture	
Culture oriented toward contemplation, reflection, self communication -- spirit activity, less dynamic than necessary in order to satisfy material needs of society	mixed	Culture oriented toward action, objective knowledge -- - a more dynamic culture
	Content of language	
Words have a many layered,	Words have a many layered,	Science arises from division:

plural character. They work through connotation – giving rise to images and feelings through associations with words. Words are sacred.	plural character. They work through connotation – giving rise to images and feelings through associations with words. (In the Russian language the notion of "ownership" was replaced by a concept of joint being.)	things and words, a man and a world, subject and object, knowledge and ethics. Words are instruments of reason. Single, measurable meanings for words are preferred. The intent is precision and agreement on definitions. Scientific words are stripped of holiness and metaphorical value.
Notion of "Development"		
"Development" as self-perfection, vanquishing sin in people (a spiritual view of the problem).	"Development" as self-perfection, vanquishing sin in people (a spiritual view of the problem). Archimandrite Illarion Troitsky wrote: "**The Orthodox ideal is not Progress but Transfiguration...** The New Testament says nothing about progress in its European sense as regards movement forward within the same plane. The New Testament speaks of the transformation that causes an upward movement toward Heaven and God. "The truth is not outside you but inside you. Take control of yourself, and you will recognize the truth. The truth is not in your belongings nor is it in some place overseas. The truth is in self-perfection".	"Development" has been interpreted in the West mostly in terms of sciences technology (a technocratic view of the term). Technological progress as the mainstream idea. Personal development lies in the domain of religion or education.
Universe: unlimited transformation of universal elements, which in principal cannot be interrupted by exit into new quality [probably a better translation is needed. I am not sure what this means.]	Active evolution, directed line of development: world must have a beginning, be directed toward a goal, to strive for a "perfect point", which will provide the beginning of a qualitatively new being (super-life, super-consciousness, etc.) Solovyev: history as a joint creative process of God and people; an attempt to unite the realm of God and a theory of	The basic idea is decentralization, individual initiative, "self-organization" rather than "directed evolution". This is Popper's idea of "open society." It is based on recognition of limited human understanding. No one can design a large system, so make many small experiments.

	progress. Fedorov: a technocratic view of the world is temporary, not the main stream of development	
Source of development		
Cooperation Both a philosophy of struggle and a philosophy of cooperation, mutual support	Cooperation, mutual aid Darwin without Maltus: a philosophy of cooperation, mutual support, a philosophy of unity. Kropotkin: possibility of survival is increased to the degree that people are able to adapt to each other and to the environment to achieve harmony. (P.A. Kropotkin (1902) "Mutual aid as a factor of evolution") Kropotkin "Morality of anarchism": «Mutual support, justice, morality — these are consecutive stages, which we watch while researching the world of animals and man. This is an organic necessity… which is confirmed by what we see in the animal world… Feelings of mutual support, justice and morality are deep inside a man, this is a great force in his instincts. The strongest of these instincts is an instinct of mutual support»	Struggle, competition Social Darwinism: a philosophy of struggle. People cooperate within competing organizations. People cooperate within society. Competition and fear of bankruptcy motivate innovation and change. Religion emphasizes cooperation and caring for others and the community.
Model of a person		
Creative activity, which is the sense of "I", is realized only in a spiritual place and it is impossible to be aware of it analytically. One becomes aware of it through reflection or meditation.	A stereotype of perceiving Russia as emphasizing a collectivistic consciousness and insufficient development of ideas about an autonomous personality and individuality. But the history of Russian thought can be considered as a sequence of intensive discussions about the notions of "personality", "subject", "individuality", etc.	An individualistic culture, widely expanded idea of a person as atom, an active person, who realizes himself through activities, and in this way he modifies the world and himself. The origin of the idea was a desire for greater personal freedom, to break free from the determinism of social class in feudalism. The idea was not to reverse the class

	Creative activity	structure but to allow each individual to rise (or fall) depending on his/ her abilities.
Nature of man		
Imperfection, self-development	Imperfection, "intermediation" of the current on-going crisis nature of man, a nature which must be developed further	The nature of man may not change much, but education and religion can improve a person, and changes in laws and institutions can change society for the better.
I		
"I" means "my part" Activity of a person is explained by norms and rules of behavior	"I" means cathedral personality; at present "I" as individuality in business and "I" as a part of "we» in personal life Activity of a person is explained by ethics (motives for action)	"I" means individuality, personality Activity of a person is explained by purpose and motivation operating within social and ethical norms.
Rationalism		
Rationalism as a kind of harmony	Rejection of the main paradigm of rationalism, which says that a man is only an observer. Since Sechenov's time in Russia the point of view that a man is only a part of a general, united system, and he is in deep connection with it. Vernadsky and T. de Sharden took the next step: they said that the noosphere is an integral part of our world; the noosphere as presence and activity of a homo sapiens, as a factor of the cosmos.	The mainstream paradigm – rationalism. Von Foerster sought to add the observer to science. Soros introduces participation as well as observation. Participation is important, particularly for the social sciences.
Unity		
Metaphysics of unity: a contemplative merging of a person and the world, self-dissolving and subordinating "I" for social, group discipline; principle of "not-doing" as striving for not	**Philosophy of unity**. The subject of the planet's and cosmos's creative actions is the whole humankind, not just a person. Russian cosmism or universalism is based on the suggestion that man is a being	**Economics of unity** The idea of globalization can perhaps be interpreted as a technical-economic version of the Eastern idea of "unity". What is driving globalization is individual consumer

breaking the natural order (Dao) ; rejection of activity releases a person from his wishes and allows him to reach absolute harmony. All his activity is directed inside himself and becomes spiritual.	with universal internal content, with openness to people, to history, to the universe and to God. Cosmism is a philosophy of life, death and immortality of a man and universe. This is a philosophy of looking for and finding the highest sense of life; this is a philosophy of hope and salvation.	decisions. There is a lot of pressure on traditional ways of thinking. Globalization can include world markets and standardized legal systems (e.g., the Bologna process). Westerners are suspicious of Utopian social engineering. They favor piecemeal social engineering.
Reaction on social ideas		
An attempt to adapt social ideas to traditional national culture.	"Outstripping reaction" on social processes, which have only began in Russia, but which have taken certain forms in societies in the West. (Historically, Russia is less developed than western economies and societies. So, every time when we decide what next step to take, we look at the West and we can look critically, because the West has already tried something which we have only thought about. So, we have an opportunity to see positive and negative results of introducing this or that idea. And we think, is it necessary for us to introduce something similar?)	Imitate good ideas developed by others. Try to be first with a new, profit-making ideas.
Economic relations		
The capitalist market for labor is only a modern form of a market of faithfulness (economic relations are seen in categories of traditional society)	Dualism of Western political economy (an economy without ethics) was rejected by Russian social philosophers and economists. For example, V. Solovyev interpreted the Western division between knowledge and ethics in economics as a tragedy for political economy. Russian philosophers rejected the designation of political economy as a science.	Atomization of people and transformation of each person into a free entrepreneur is a binding condition of effective capitalism. (Economic relations are seen in terms of the mechanical political economy of the West) An economy or a society is viewed as a machine – change the rules of operation, and it works differently. Evaluate the rules on their consequences, not the rules themselves.
Development of science		
	The new direction of	Presently science works for

Attempt to develop science on different logical principles	development for science -- a synthesis of sciences – is not just a positive development, but a moral imperative. [Integration of theories or the principle of parsimony – a small number of statements to describe a large number of observations – is fine.] It is belived to introduce moral criteria into science, to determine the highest goals for scientific researches. The intent is to make discoveries which work for positive development of the world.	both creation and destruction Science tells us how the world works. Humans use it for their own ends. Human beings shape the direction of science by asking questions. Presently science is looking for a new type of thinking, which could help to solve global problems. Linear thinking has led to a human dominance of nature. We now need a more holistic view of the environment and society as a whole.

Accordingly, the Russian intellectual tradition might be characterized by follows:

- In the Russian intellectual tradition the terms "Russia" and the "West" do not have exclusively geographical, political or sociological meaning. **They are codes signifying fundamental philosophical questions about thinking and culture.** The term "West" refers to universal, rational truth without taking into consideration any differences in life and cultural practice. The term "Russia" refers to the impossibility of such a universal truth and a necessity to look for solutions on the level of life, not only on the level of rational thinking.

- The Russian intellectual tradition focuses on intuitive, mystical cognition of essence, its hidden depths, which cannot be grasped by logic and logical ideas; they can be grasped only by symbols, by images, by imagination.

- Historically the Russian intellectual tradition is broader (in direct and existential senses) and dualistic. On the one hand, there is a strong striving for being a part of the West. But this requires acceptance of Western values. On the other hand, there is a strong rejection of absolutely rationalistic consciousness. This internal paradox leads to an existential drama. Western science claimed neutrality relative to values. The Russian intellectual tradition never accepted this neutrality.

- The style of Russian writings might be characterized by a striving to combine ideological tasks with scientific tasks, substitution of notions, ambiguous of intonations. Often that is a result of the complexity of political life. In Russia it formed a type of scientist-devotee for kindness and truth, who sacrificed not only his comfort or personal career in spite of his convictions, but often also his freedom and life. M.N. Gromov wrote, "on the end of the heap, at the point between life and death, before the face of eternity other thoughts come to mind, than when you sit at a desk."

- Radicalization of a problem
- Openness , an integrated Russian world view

- Russians feel a need to understand the world as a whole. Therefore, they emphasize different patterns in the world, society and nature than is emphasized in the Western intellectual tradition.

For example, Western economists emphasize functional relations when analyzing economic processes. Russian economists emphasize “relations between people relative to ...”. The Russian intellectual tradition describes each level of life by the associated mentality. Mental characteristics are associated not only with the organism, but also with social and economic systems. Currently academician Moiseev stresses that the formation of a global collective consciousness lays the foundation for the development of an information society. In his article, "No third option," he writes, "The notion of collective consciousness is a fundamental notion of civilization... Civilization itself could not emerge without development of a collective consciousness. This phenomenon emerges as an effect of the necessity and possibility of information exchange among individual consciousnesses, evolution of collective memory and organization of collective efforts in decision making." [Moiseev, 1995] Western academics are more likely to speak about “shared beliefs and values’ rather than a “collective consciousness.” Many Russian scientists have been characterized from the position of Western science as religious thinkers (such as economist S.N. Bulgakov or philosopher V. Solovyev) or utopian thinkers (such as sociologist, economist, and writer N.G. Chernyshevsky). Or, they were considered even as non-scientists (such as philosopher N. Berdyaev), because they used a different foundation for their process of thinking.

- Russians prefer a systematic approach and have a tendency to create general theories. Examples are such well-known names as N. Lobachevsky or D. Mendeleev. The first systematic critiques of classical rationalism as a scientific position were formulated in Russia. Although rationalism led us to the gate of truth, it is fated not to open the gate. (I. Odoevsky)

Hence, Russian scientific thinking can be characterized by the systems approach, a striving to create general theories.

Development of Soviet cybernetics through the prism of the Russian intellectual tradition

Soviet cybernetics	**American cybernetics**
If we ask a Russian person who is not a scientist, “what is cybernetics?” most likely the answer would be, “Cybernetics is a science about computers: how to build clever machines, how to work with them, programming, etc.” If a person has a good soviet technical education, probably he would say that Wiener, an outstanding American scientist, is the farther of this science. He introduced this notion in his book “Cybernetics, or Control and Communication in the Animal and the Machine”, which was published in 1948.Wiener defined cybernetics as a science about managing and control in any systems, including technical and biological.	There are now words such as cyberspace, cyber terrorism and cybercafé. But if we ask an American, what is cybernetics, he does not know what it means. Some people suggest cybernetics is related to computers. Everyone is familiar with "cyberspace" or even "cyberwar", but they do not make the connection to cybernetics.
Wienner’s book was published in the USSR in 1958 and became very popular.	Wienner’s book and notion “cybernetics” were not as popular in the US as they were in the

	USSR, or the popularity faded more quickly
At the end of the 1950s and the beginning of the 1960s, there was a cybernetics boom in the USSR. Many scientific-research institutions were organized. Cybernetics departments in universities, laboratories, cathedras, scientific journals, etc. were created. Many people were involved in this activity.	In the US, the home of cybernetics, no cybernetics departments were established at universities. Some people do research in these scientific fields, but they are located in other departments: psychology, mathematics, management, philosophy, neurophysiology, engineering, etc. An American Society for Cybernetics has existed since the early 1960s, but it is quite small. If you want to learn management theory or signal processing at an American university, one must take a course "control engineering" or "signal processing" and there will be no mention of Wiener's works in the program.
There was no clear understanding of what the term "cybernetics" means. Consequently, it was defined in a wide variety of ways. What was most commonly studied under the label of "cybernetics" was the boundary between the technical and mathematical sciences, for example what is called theoretical computer science in the West.	Theoretical computer science
There was an anticybernetics campaign in Khrushchev's time. "Soviet scientists chose different strategies to overcome this impasse. Some discarded much of contemporary Western science and attempted to build a distinct, ideologically superior national approach. Others ingeniously split Western scientific theories into two parts: "the objective content" and "the philosophical interpretation". They creatively reinterpreted Western theories both scientifically and philosophically, in an effort to rescue the "essential" elements and sacrifice only the "dispensable" ones. They freely criticized and rejected the latter, while adopting and further developing the former. What gradually emerged was a popular image of Western science as a centaur with a solid body of scientific facts and an ugly bourgeois face."	Engineering cybernetics, biological cybernetics
Interpretations of cybernetics ranged widely from "modish pseudo-science" to a "romantic admiring" of cybernetics as personifying freedom, something new, something which is different from what is Soviet.	Social cybernetics

At the end of the 1960s, the academic city near Novosibirsk was a place where the soviet cybernetics was developed. There was a club "under integral", a coffee cybernetics club (CCC), a cinema club "Sigma" and meetings with famous people. There was an atmosphere of freedom. From a newspaper: "Earlier boys left their homes for America, for Indians, now they are going to Academgorodok, to Lyapunov" or "in Soviet district of Novosibirsk there is no Soviet power".	
Collapse of the USSR	Soviet scientists move to countries around the world

Bogdanov's tektology in the context of the Russian intellectual tradition

" As a generalization of all investigations of human experience, tectology is a completion of the cycle of the sciences …" [A.A. Bogdanov]

In the Russian intellectual tradition an idea of world integrity finds its first rational-theoretical contours. One of the best examples of such a theory is Tectology, written by outstanding Russian scientist A.A. Bogdanov. Bogdanov considered Tectology as a methodological basis of world cognition, allowing to create the picture of the world for all science. For him tectology is "a developed and generalized methodology of science", "a science of comprehensive scale and a general methodology of any practice and theory"

He tried to find universal principles of organization for living and non-living nature. He defined Tectology as a science, uniting organizational methods of all sciences. His original proposal was to unite all human, biological and physical sciences and consider them as systems of interrelationships in a search for organizational principles, lying at the basis of all types of systems.

In the framework of tectology he attempted to transit from the contemplative-descriptive character of philosophy to using it as "a practical theory". Bogdanov criticized limited thinking, derived from specialization and attempted to create a universal, general basis of a new science, uniting the organizational experience of humankind. The task of a new science should be a systemizing of organizational experience. Tectology should find the organizations that are in nature and human activities and then explain them, that is, to install abstract schemes of their trends and determine the directions of the development of organizational methods and their role in world development. He thought that finding general laws by the process of generalization and abstraction creates the fundamental basis for planned organizational activity – practical and theoretical. His goal was systemic research on general laws of the functioning and development of different systems in order to use them for solving scientific and practical tasks. The idea was that the organizational point of view is a means of solving practical tasks.

Such ideas, which are stated in Bogdanov's book, necessarily require appropriate socio-cultural conditions. Cybernetics ideas and ideas of general systems theory became widely known in the scientific world in a period of scientific-technicological revolution, when the intellectual climate in science was changing. The tasks of overcoming narrow specialization, integration of the

sciences, synthesis of scientific knowledge and organizing interdisciplinary research became tasks of the first priority.

Dr. Gorelik, University of Britain Columbia, in a paper "A.A. Bogdanov's «Tectology» , general theory of systems and cybernetics», published in 1987 wrote: "although tectology contains all the ideas which were developed and popularized by general theory of systems and cybernetics later", it is something larger. It is a specific field – "all forms of organization in nature and human activity", and it is an "utmost widening of any theory of systems".

Another Canadian scientist R. Mattesich determines Bogdanov "creator of a really comprehensive theory of systems" in his book "Instrumental Judgment and System Methodology".

Russian scientist Kostov writes: "[…] on the largest historical scale it is possible to define at least two global integrations of scientific knowledge and they are limited by two great scientific revolutions. The first happened in XVI-XVII centuries in natural sciences, and the second – in XX century in both the natural and social sciences at the same time. Personifying the first revolution was Isaac Newton and the second Alexander Bogdanov. The works of Newton became the trigger for a scientific revolution in the natural sciences, and the works of Bogdanov – in the whole field of scientific knowledge. The core-catalyst of the first scientific integration was the mechanics of Newton, later called classical mechanics. The second, the tectology of Bogdanov, as a total organizational science, having all reasons to be in the same domain as mathematics, logic and philosophy." [Urmantsev, 1995, p. 15]

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