

International Conference on Research Paradigms Transformation in Social Sciences 2014

## Socio-Technocratic Discourse of Technoscience

Irina V. Chernikova<sup>a \*</sup>, Daria V. Chernikova<sup>b</sup>

<sup>a</sup> Tomsk State University, Tomsk Polytechnic University, Tomsk, Russia

<sup>b</sup> Tomsk Polytechnic University, Tomsk, Russia

---

### Abstract

The paper is focused on specific features of social science development on new stage defined as postnonclassical paradigm of social sciences. Specific features of knowledge acquiring and development in postnonclassical paradigm of social sciences are revealed. It is highlighted that postnonclassical paradigm of scientificity correlates with the stage called “technoscience”. It is proved that in frames of the present system of scientific knowledge classification (classical, nonclassical and postnonclassical scientific paradigms) that includes natural, social and technical sciences, technoscience cannot be referred to any of these types of knowledge. Technoscience represents new concept of knowledge production, new socio-technocratic discourse. The specific character of technoscience is in the fact that its objects are not objective reality in Cartesian dualistic worldview, but so called “human-dimension” objects. New stage of integration of science and society is characterized by new methodology of transdisciplinary research. Transdisciplinary research in comparison with interdisciplinary are distinguished by gateway to life practice; it is socially allocated production of knowledge. Knowledge is produced not only in context of inventions and fundamental rationales, but as well in context of assessment of application consequences (social assessment of technology). In is highlighted that technoscience refers to activity in frames of which science and technology make a sort of mixture or hybrid. Technoscience can be interpreted as specifically contemporary phenomenon, social technology in its own way.

© 2015 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/3.0/>).

Peer-review under responsibility of Tomsk Polytechnic University.

*Keywords:* science, society, knowledge, transdisciplinary research, postnonclassical paradigm, technoscience, social technology;

---

### 1. Introduction

Science was traditionally focused on obtaining authentic knowledge about nature (natural sciences) and about society (humanities and social sciences). While describing the evolution of natural sciences in western culture V.S. Stepin grounded the viability of three scientific rationality paradigms: classical, nonclassical and postnonclassical (Stepin 1989). Afterwards V.G. Fedotova and group of researchers proved that this typology is applicable for social sciences as well. At that separation of classical, nonclassical and postnonclassical stages in

---

\* Corresponding author name. Tel.: +7-913-800-2419  
*E-mail address:* [chernic@mail.tsu.ru](mailto:chernic@mail.tsu.ru)

evolution of social sciences and humanities is connected with the specific understanding of object, namely society. The correlation was revealed, though not absolutely univocal (due to uneven development of scientific disciplines), between stages of science and society development. “There are significant grounds to confirm the correlation between the largest system-forming trends: precontemporary traditional society – preclassic science, compound knowledge; contemporary society – classical science; late contemporaneity – nonclassical science; postcomporaneity – postnonclassical science.” (Fedotova 2001, 39) To develop the idea of postnonclassical stage of social sciences dynamics we set the task of characterizing the specific features of obtaining and evolution of knowledge in postnonclassical paradigm of social sciences.

## 2. Research methodology

The paper describes and proves the following hypotheses: in frames of the present system of scientific knowledge classification with natural, technical, social sciences and humanities technoscience cannot be referred to any of these types of knowledge. Technoscience represents new concept of knowledge production, it is characterized by new socio-technocratic discourse.

Method of comparative analysis of descriptive and normativist programmes in social sciences and technologies is applied. The viability of transdisciplinary research methodology of science and society in postnonclassical paradigm of social sciences is proved.

## 3. Research results

Upon science evolution specific type of scientific activity appeared marked by term “technoscience”. Belgian philosopher Gilbert Hottois who popularized the term “technoscience” noted that objectivity of the contemporary science “is more and more revealed in technical efficiency and creativity... Technosciences create the realities to study” (Hottois 2004, 262). Well-known sociologist Bruno Latour characterizing new type of relationships of science and society highlighted that science is no longer concern of cabinet mind; it became the space of “mutual adjustment” of humans and objects. Previously society surrounded autonomous science, but it remained outsider concerning principles and methods of scientific rationality functioning. Contemporary science and what we traditionally call society are interconnected (Latour 1998, 209). This new type of science Latour marked by term “technoscience”. Characterizing science as new type of knowledge he counterposed science and research. He notes that there is no integrated and autonomous science any longer, however the research appeared. “Science is truthfulness, though research is uncertainty; science is strict, linear, independent and detached, and research is tangled, risky, dependent and emotional; science settles problems, research inflames disputes; science produces objective knowledge, abstracting from affects and ideology, and research is feeding by these phenomena” (Latour 1998, 208).

In the project of knowledge marked by term “technoscience” cognition is not explanation like in natural sciences, and not understanding like in humanities, it is project-constructive activity. This cognition is not objective, it is technologically oriented. In context of technologies it is impossible to divide and counterpose object and acting subject, natural and artificial. Technology is not a collection of artefacts, but as Latour stated, it is a complex of individuals and objects connected by the various types of associations. Technoscience is not a technical science; it is a new form of science organization integrating many aspects of natural sciences, technology and humanities. In technoscience technological efficiency replaces truthfulness, knowledge is a project of action, and cognition model – is construction. Specific feature of technoscience is that its objects are not objective reality in Cartesian dualistic worldview, but so called human-dimension objects. Basic feature of technoscience is high socio-practical orientation. NBIC-technologies can serve an example of research marked by “technoscience” term.

It is postnonclassical scientificity that was related to technoscience by well-known Russian philosopher V.S. Shvyrev. He highlighted that classical and nonclassical science fix characters and correlations of objects, and only postnonclassical science works with reality involving objects and human world: “Postnonclassical

rationality is not just cognitive rationality tending to design reality “as it is”, it acts as a form of socio-humane project-constructive rationality.” (Shvyrev 2008, 45)

Thus technoscience is considered contemporary form of scientificity. Technoscience refers to activity in frames of which science and technology form a sort of mixture. Technoscience is interpreted as specifically contemporary phenomena, a social technology, of its kind.

#### 4. Conceptualization of social technologies (ST)

Notion of technology, as V.G. Gorokhov notes, in Russian language initially meant production of artefacts, lately it is interpreted as operational description of any activity, including algorithmic description (Gorokhov 2012, 81). G.P. Schedrovitskiy was one of the pioneers who designed a project of new type of knowledge (not objective, but technological). He interpreted knowledge not as knowledge about objects beyond us, but as formula of our actions to achieve our goals (Schedrovitskiy 1995, 439).

Common ideas of technoscience shared by representatives of various philosophic schools state that unbreakable bond exists between research activity and practice of innovative technologies design. Fundamentality is opposed to growth of new knowledge, and new interpretation of knowledge appears: to know means to be capable for adequate actions and for adaptation.

The most challenging question is: what is knowledge in technoscience? Important aspects of the problem are discussed in frames of social epistemology. Social epistemology in comparison with other theories of science interprets knowledge as product of cognitive activity of individual included in complex of interactions and correlations. I.T. Kasavin offers discourse-technologies as possible model of ST (Kasavin 2010, 7-9). Developing this idea A.S. Ignatenko equals ST with third model of knowledge: 1 – classical model of knowledge, 2 – power-knowledge, 3 – knowledge-technologies “Technology succeeding power acts in a more delicate way. Power is hard and soft ware, technology is only software. It controls not only body, but as well soul, conscience and personality.” (Ignatenko 2011, 130) Further we shall interpret social technologies (ST) as communicative activity aimed at social construction of reality.

Interpretation of knowledge in epistemological aspect relates knowledge to objective information and sound opinion. Representatives of social epistemology try to reveal epistemologically essential of their sociological, historical and anthropological research. In social epistemology classical and nonclassical approaches are distinguished. The representatives of the first share normativist approach to knowledge by connecting knowledge and truth. Nonclassical approach is represented by postmodernists (Richard McKay Rorty, Jacques Derrida, Michel Foucault, Nelson Goodman...), representatives of the strong programme of sociology of science (David Bloor, Barry Barnes) and social constructivism (Bruno Latour, Stephen Woolgar). David Bloor, Barry Barnes and Helga Nowotny together with Ludwig Wittgenstein share descriptivist (opposite to normativist) interpretation of cognition stating that knowledge should be studied as tradition by describing, not by evaluating. David Bloor designs several models of society influence on knowledge. Sociality of knowledge is interpreted as reflection of society basic models in knowledge systems. Representatives of the strong programme of sociology of science, David Bloor in particular, consider knowledge socially shared conviction. Knowledge objectivity is provided by its social character. Collectivity of knowledge, its autonomy from conscience and will of individual provide objectivity (Bloor 1976, 156).

Alvin Goldman, author of the “Knowledge in Social World” represents normativist approach. He counterposes its programme called “veritist” (*from Lat. Veritas* – truth) to strong programme (Goldman 2003, 407). In methodological aspect normativism is opposed to descriptivism. Bloor rejects truth as criteria for individual knowledge, though Goldman considers truth as transcultural and transsocial human value. Goldman applies truth to evaluate social practices. He defines truth in terms of correspondence theory, and knowledge – as truthful opinion. Goldman analyses influence of social context to cognitive process. Individual epistemology is developed by Alvin Goldman in “Epistemology and Cognition” (Goldman 1986). Knowledge involvement in truth is explained in frames of “reliablism” concept (reliability theory). This concept is founded by realism idea: conviction of external substances existence can be produced by social interactions, however external substances

cannot be produced this way (Goldman 2003, 16). The task of social epistemology is to discover how cognitive processes reach the maximization of truthful opinions.

Steve Fuller takes intermediate position between descriptive position of David Bloor and normativist programme of Alvin Goldman. Knowledge is characterized as “complex of behavior acts and events, each of them can be adequately explained without addressing specifically epistemic characteristics.” (Fuller 2002, 151) Sociality, according to Fuller has net structure, where knowledge facilitates stable condition of the net. Knowledge is interpreted as social capital. Production of knowledge appears as more complex phenomena, than it was described in classical epistemology. Epistemologist as “manager of cognitive economics” controls condition of knowledge production and distribution.

I.T. Kasavin considers the fact that conceptions of Bloor and Fuller are limited in confrontation of classical and nonclassical epistemology as their main disadvantage. He supposes that contemporary epistemology should be constructed on new basis, interpreting it as elimination of contradiction of classical and nonclassical approaches. This will be postnonclassical cognition theory keeping the role of philosophy, on one side, and recognizing the essence of interdisciplinary interaction, on the other side (Kasavin 2010, 14).

## 5. Transdisciplinary discourse of technoscience

In new concept of science, called postnonclassical science, technoscience, knowledge of the Mode 2 is produced not only in the context of finding and fundamental objectivation, but in the context of assessment of application consequences as well. Thus sufficiently close are the notions “Technology assessment” (TA), “Scientific-Technology-Society” (STS), “risk analysis” and “analysis of technical innovations” and etc.

A. Grunwald notes that “technology assessment in accordance with the relevant literature is social and scientifically proven practice compliant with the requests of society in generation, intermediation and implementation of the definite types of consistent knowledge regarding science and technology.” (Grunwald 2008, 35-36) Social assessment of technology is considered as a type of social practice, though Grunwald highlights presence of the conceptual principle in theory of technology social assessment. The common lying in the basis of various social practices – orientation to consequences, scientificity, demand for public consultation – is considered as a conceptual principle.

Technological progress made us think about the consequences of scientific inventions. Social assessment of technology is considered applied philosophy of technology (Gorokhov V.G., Grunwald A.). Authors note that social assessment of technology is not only interdisciplinary, but transdisciplinary research as well. The latter means its correlation with the extensive social agenda (Gorokhov, Grunwald 2011).

Transdisciplinarity came into practice of science and became especially essential in light of technoscience and converging technologies. Transdisciplinary research in comparison with the interdisciplinary is characterized by the release to practical life; it is socially dispersed knowledge. What is new in this characteristic of knowledge? Earlier during the evolution of science we also had research conditioned by the practical application along with “knowledge for the service of knowledge”; and socio-cultural parameters were as significant as cognitive factors. The new concept of knowledge production “New Knowledge Production: Dynamics of Science and Research in Contemporary Societies” contains new characteristics of the mode 2 of knowledge production: transdisciplinarity; organizational variety; social responsibility and reflection; assessment and quality control. Fundamental knowledge is deflected by various social subjects with the aim of the autonomous knowledge production. De-bordering between science and society, between fundamental theoretical research and innovation enables researchers to state transcendent shift of scientific knowledge to live world (Gibbons 1994).

Thus, transdisciplinary research is a new stage of integration of science and society. The prefix “trans” (*from Lat. trans* – through, across) indicates new type of knowledge production. If interdisciplinarity is internal scientific phenomenon, Transdisciplinarity fixes as well “cognitive situations when on different reasons scientific mind has to make transcendent shift to live world in order to find entirety and proper validity” (Kiyashhenko, Moiseev 2009, 17). In new concept of science marked as postnonclassical science, technoscience, knowledge of

mode 2, knowledge is produced not only in the context of revelation and fundamental objectivation, but in the context of assessed consequences of application (social assessment of technology).

## References

- Stepin, V.S. (1989). Scientific cognition and values of technogenic civilization. *Voprosy filosofii (Philosophical magazine)*. No 10. pp. 3-18.
- Fedotova, V.G. (2001). Metatheory – Macrosocial context. *Social knowledge and social changes*. M.: IF RAN. pp. 4-49.
- Hottois, G. (2004). Techno-sciences and ethics. Right, Wrong & Science. Ed. by Craig Dilworth. *Poznan Studies in the Philosophy of Science and Humanities*. Vol. 81. Amsterdam-N.Y., p. 262.
- Latour, B. (1998). From the world of science to that of research? *Science magazine*. Wash. Vol. 280, No 5361. p. 209.
- Shvyrev, V.S. (2008). On correlation of cognitive and project-constructive function in classical and contemporary science. *Cognition, interpretation, construction*. M.: IF RAN. pp. 30-48.
- Gorokhov, V.G. (2012). Technique, technology, design – sociotechnology, socio-humane technologies, social design. *Epistemology & Philosophy of Science*. No 1. pp. 80-90.
- Schedrovitskiy, G.P. (1995). *Selectas*. M.: Izd. Shkola Kul'turnoj Politiki. 588 p.
- Kasavin, I.T. (2010). Social technologies and scientific knowledge. *Epistemology & Philosophy of Science*. No 4. pp. 5-16.
- Ignatenko, A.S. (2011). Social technologies and power of knowledge. *Science & social technologies*. M. IF RAN. pp. 127-139.
- Bloor, D. (1976). *Knowledge and Social Imagery*. L. p. 156.
- Goldman, A.I. (2003). *Knowledge in Social World*. Oxford-N. Y. p. 407.
- Goldman, A.I. (1986). *Epistemology and Cognition*. Cambridge. Mass.
- Fuller, S. (2002). Not the best of all possible critiques. *Social epistemology*. Vol. 16. No 2. p. 151
- Social epistemology: ideas, methods, programmes. (2010) M.: Kanon+, 712 p.
- Grunwald, A. (2008). On the way to theory of technology social assessment. *Epistemology & Philosophy of Science*. No 3. pp. 35-56.
- Gorokhov, V.G. Grunwald, A. (2011). Every innovation has social character! (Social assessment of technology as applied philosophy of technology). *Higher education in Russia*. No 5. pp. 135-145.
- Gibbons, M.et al. (1994). *The new production of knowledge: the dynamics of science and research in contemporary societies*. London: Sage.
- Kiyashhenko, L. Moiseev, V. (2009). *Philosophy of transdisciplinarity*. M.: IF RAN.