Socio-philosophical analysis of innovations

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As a new field of study, "innovation" is part of contemporary philosophical thought, often grouped with social philosophy, philosophy of science and technology. More precisely, it is part of the science of praxeology. The prioritizing of science as a key part of national development strategy is supported by a number of academics[1] as a prerequisite for social change, in accordance with the current developmental stage of the globalized world.

There is a large body of research dedicated to the **socio-philosophical analysis of innovation**, examining its genesis, structure and specific characteristics.[2] However, in general, there is insufficient paid to its most important aspect regarding the philosophy of its measurement. This aspect is its reflective nature, which reveals its place and role in the development of society through the established categorical scheme of philosophical methodology. A justified philosophical model of innovation requires at least two essential conditions: recognition sequence of the innovation process, and increased financial investment in science (as science is becoming more and more expensive). Thus, the economic context of understanding innovation is crucial for each research project.

But what distinguishes philosophy of innovation? In our view, the attributes of philosophical analysis are always theoretical schemes – categorical and methodological, which in turn can be set in the universal sense, including the praxeological. In philosophy, the multiple facets of innovation (high tech, novelty, patenting, techno-sphere, technological innovation, advanced technology, commercialized innovation, induced innovation, innovation creativity, innovative changes, etc) create confusion in the determination of notional apparatus

and concept dichotomy, object and purpose within the history of human activity and resources. "On the one hand, innovation represents continuity with the past. It is continuity in the sense that innovation is about novelty, an idea that was present in many forms before innovation took on a central place in representations, as we will see. It is also continuity in the sense that innovation is, to many, concerned with technological invention, which is a dominant understanding of what invention came to mean over time. However, on the other hand innovation is a break with the past in the sense that it suggests that invention per se is not enough. There has to be use and adoption of the invention, namely innovation, in order for benefits to accrue.[3]" As this paper does not seek to explicitly clarify the terminological polemics around "innovation", or its genealogical outline (about which much has been written), we will only seek to support the arguments that innovations should be analyzed within their internal, contextual, and structural elements related to a certain time. Thus, "innovation" is now more all-encompassing in terms of its internal constituents and consistent elements.

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[1] Scharft, Robert Malden, MA, Blackwell Publishing, 2003: In philosophy of Technology: Technological Condition; Jacques Ellul, Robert K. Merton: The Technological Society, 1964, Vintage; Степин В.С., Кузнецова Л.Ф.: Научная картина мира в культуре техногенной цивилизации. М., 1994 (in Russian); Benoit Godin: Innovation: The History of a Category (Project on the Intellectual History of Innovation, Working paper Nr.1), Montreal, Quebec, Canada, 2008.

[2] Collins, H. (2010). Tacit and explicit knowledge. Chicago: University of Chicago Press; Eric Von Hippel, Democratizing Innovation, The MIT press, Cambridge, Massachusetts, London, England,2005, 204 p.; Lebedev SA, Kovlina Y. The philosophy of science and innovation. Moscow: Academic Project, Paradigm, 2012, 182 p.; Nordmann, A. (2011); The age of techno science. In A. Nordmann, H. Radder, & G. Schiemann (Eds.), Science transformed? Debating claims of an epochal break (pp. 19-30). Pittsburgh: University of Pittsburgh Press; Koepsell, D. R. (2000). The ontology of cyberspace. Philosophy, law, and the future of intellectual property. Chicago: Open Court; Layton, E. T. (1974). Technology as knowledge. Technology and Culture, 15(1), 31-41; Lea, D. (2008). The expansion and restructuring of intellectual property and its implications for the developing world. Ethical Theory and Moral Practice, 11(1), 37-60; Wayne M. Bundy Innovation, Creativity, and Discovery of Modern Organizations. Quorum Books, 88 Post Road West, Westport, CT 06881, Greenwood Publishing Group Inc., USA, 2002, 286 p.

[3] Benoît Godin: "Innovation: The History of a Category" 385, rue Sherbrooke Est Montréal, Québec Canada H2X 1E3 benoit.godin@ucs.inrs.ca. Project on the Intellectual History of Innovation. Working Paper No. 1, 2008, p.89.

Today, innovations from the leading high-tech industries significantly penetrate society and culture. Enhanced application of ICT technologies, biotechnology and biomedicine, artificial intelligence and anthropomorphic robots, new biometrical devices such as iris checks, sound wave measurements, sound editions and other features or security checks that have become part of immigration procedures, open up new horizons and norms for scientific research, as well as generating new ontology and global "communication hubs" for further research. The modern world has also begun to dismantle the old philosophical dichotomy of subject / object, and calls for the "unbundling of meanings".

Modern philosophy of science and technology should encompass the major technological advances of post-industrial civilization and innovative industry. In its turn, the latter should move in the direction of maximally "pragmatic philosophy". Thus the new field of study is generated at the intersection between biosocial and technology, more precisely at the edge of the boundaries of “novelty” and “traditional”. This is a new crossroads, where the alternative ontology and epistemological models are expanding the axiological and moral horizons. That is why it is logical to assume that the modern philosophy of science and technology should also serve as an innovation philosophy.

However, the object of its study is not only **the phenomenon of modern technology** and "high-tech" developments, but the essence of both. In fact, as a type of active agent, innovation substantially transforms and changes the content of the old traditional philosophical problems and issues, at the same time involving the human presence as the main vector of development, which is directed towards the soaring technological intervention in biosocial spheres. It is useful at this point to provide some models of philosophical interpretations related to the identification of content analysis of innovation for greater clarity.

Robert K. Merton, Jacques Ellul, and Mario Bunge[4] are leading philosophical analysts of technology who have also delved into the holistic and scientific evaluation of innovation phenomena. In the book “The Technological Society” (1964), Ellul described technological innovation as a “technique” to be applied to the global applications of the cycles for gaining final and successful goals. He wrote that “technique” is potentially applicable to any area of life and is always judged and modified by the criteria of efficiency. While describing technology, Mario Bunge states that it is unfortunate that the philosophy of pragmatism has given us less than expected. He describes the relationship between technology and philosophy “in terms of inputs and outputs. On the output side, he notes the technology supplies system-theoretical-ontologies (i.e. conceptual systems of the

nature of scientifically knowable object like Bunge himself has produced in a multi-volume treatise)[5].”

Another **modern conceptual source of the subject** matter is the “The Ellul Forum” founded in 1988. It plays a crucial role in illustrating and debating the research and analyses of innovations. It publishes articles and discussions on innovations, the critique referring to the technological civilizations connected with new trends of the world development. Professor Erik Persson writes: “The pathologies of “extreme science” and “the science of the implausible” show up almost everywhere in today’s scientific world, the most spectacularly, perhaps, in fields such as genetic engineering, embryonic stem cell research, cloning, nanotechnology, artificial intelligence (AI), and robotics with their outlandish discourses on such topics as the transformation of all living matter into “gray goo” through an out-of-control self-replicating nanoprocess (“the accident to end all accidents”), the selective killing of enemy populations through genetically engineered “nanoviruses”, the cure of all illnesses through nanomedicaments or stem cell broths made on aborted foetuses, the cloning of human beings and the “uploading” of their minds into a computer’s memory, or the future overshadowing and replacement of man by artificially hyper intelligent robots, just to mention a few popular themes of this kind. Evidently, also virtual reality and cyberspace must be included amongst the manifestations of “extreme science”, exuding the typical odour of unrestrained technolatry and pneumapathology.[6]” Technology is not an

[4] Jacques Ellul, Robert K. Merton (Introduction) The Technological Society Paperback, 512 pages Published October 12th 1967 by Vintage (first published 1964); Bunge M. Technology as Applied Science, Technology and Culture 7, № 3 (Summer 1966); Bunge M. Philosophical Inputs and Outputs of Technology in Bugliarello and Doner, eds., History and Philosophy of Technology (1979). Expanded Tecnologia y Filosofia, chapter 13 In: Bunge M. Epistemologia (Barcelona: Anal, 1980) and others.

[5] Scharff, Robert Malden: The Technological Condition In philosophy of Technology. MA, Blackwell Publishing, 2003, p170.

[6] Erik Persson: Cybergnosticism Triumphant? Towards an Ellulian Analysis of Cyberspace and Cybergaming. The Ellul Forum : Ellul in Scandinavia, Issue 43, Spring 2009, p.7, International Jacques Ellul Society, Berkeley, California, USA. www.ellul.org)

educational panacea. It is only a tool to help solve a broad based problem. We have to use technology rather than be used by it.[7]

Science, through its historical development, can correct the "practical urgency of innovations", which is characterized by three types of changes in the scientific rationality followed by Stepin and Kuznetsova: classical, non-classical and post-non classical rationality. They wrote: "the criteria for distinguishing them are: 1) The features of organizational system of objects assimilated by science (simple systems, complex self-correcting, self-developing complex systems); 2) the inherent rationality of each type of system of ideals and standards of research (explanation, description, rationale, structure and construction of knowledge); and 3) the specifics of the philosophical and methodological reflections over the cognitive activity, ensuring the inclusion of scientific knowledge in their historical culture.[8]"

The methodology of scientific innovation constitutes the cornerstone of its perspective dimensions, which includes three interrelated elements that are usually analyzed separately: (a) conditions for the effectiveness of innovation; (b) resources, models of commercialization of research; and (c) standards and risks of innovation.

Despite the abundance of existing interpretations about the socio-philosophical analyses of the **content and structure of innovation**, there are still some areas that require special attention from scientists. Thus we believe that first of all, there should be a clear definition encompassing the universal scale of 'innovation", with its demarcation lines consolidated into the most effective artificial integrity. Second, the process of thought in innovation (observations, hypotheses, experiments, laws and theories) is not only connected with the diversity between the old and new or various speeds of scientific development, but also with "commonalities" of modern innovations. But would this be possible? On this point, Wayne E. Bundy writes: "It is fortunate, indeed, that the scientific method is not universally accepted and is rigidly followed perception for discovery in science and technology. Such blind obedience would help to assure the persistence of status quo, thereby decreasing the credibility of the technical world.[9]"

Third, not all innovations applied in the course of the global production turn "the thing" into "hot money", "speculative transactions". This is why a comprehensive theory of "risk and management of innovations" also needs to be in place.
Fourth, the continuing changes to innovation offer an increasing number of attractive features to users, such as improvement of social welfare, social and economic accelerations, product-development activities, and so on. A more precise analysis and categorization of user and producer relations while applying innovations is clearer required. From this end, Professor Eric Von Hippel quite justifiably writes that, "if an electrician were to develop an improvement to the installation attributes of a switch, it would be considered a user-developed innovation".[10] This process will further demand the "democratizing the nature of innovation".

Future developments in the formation of new innovations will undoubtedly belong to the conceptual domain of transformation of biosphere into noosphere and emergence of artificial life of biosphere and global society in the 21st and 22nd centuries. In our opinion, this kind of systematic socio-natural approach to the changes of innovative processes will present itself as the most comprehensive method to interpret the socio-philosophical and epistemological analyses of the issue. Evidently, innovations usually turn to inherit some remarkable **metaphysical processes** of history, and one cannot contradict the following arguments and conclusions drawn by Mario Bunge:

"1. The world is composed of things, that is, it is not simple, and it is not made of ideas or of shades of ideas; 2. Things get together in systems (composed of things in more or less close interaction), and some systems are fairly well isolated from others; 3. All things, all facts, all processes, whether in nature or in society, fit into objective stable patterns (laws); 4. Nothing comes out of nothing and nothing goes over into nothingness; 5. Determination is often multiple and probabilistic rather than simple or linear.[11]"

Now, let us say a few words about the most debatable and **contradictory sides of innovation**. Techno-genetic rationale usually contributes to the improvement of living conditions. However, at the same time, it also leads to global degradation of the human biosphere, facilitating the growth of artificial life. It is also connected with the modern contradictory market economy and its formative role in the technocratic society. Scientists should more rigorously combine their efforts toward humanistic approaches to new discoveries and innovative practices, and adopt a more pragmatic focus on democratizing innovations and creativity in modern organizations. ■

Author's biography

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[7] Postman, N., 1993; Technopoly: The Surrender of Culture to Technology. New York: Vintage Books. Source: The Ellul Forum : Jacques Ellul & Latin America, Issue 40, Fall 2007, p. , International Jacques Ellul Society, Berkeley, California, USA. www.ellul.org)

[8] Степин В.С., Кузнецова Л.Ф. Научная картина мира в культуре техногенной цивилизации. М., 1994."Научная рациональность в техногенной культуре: типы и историческая эволюция" 04.06. 2012, Moscow, 1994, с. 147-148, 170-172 (in Russian)

[9] Wayne M. Bundy Innovation, Creativity, and Discovery of Modern Organizations. Quorum Books, 88 Post Road West, Westport, CT 06881, Greenwood Publishing Group Inc., USA, 2002, p.125

[10] Eric Von Hippel, Democratizing Innovation, The MIT press, Cambridge, Massachusetts, London, England, 2005, p.3

[11] Mario Bunge: Philosophical Inputs and Outputs of Technology. In In philosophy of Technology. The Technological Condition. Scharff, Robert Malden. MA, Blackwell Publishing, 2003, p176.