

Philosophical and Social Contexts of Scientific Knowledge

Summary

The present book offers the authors' effort to look at science in a new way, which would extend beyond philosophy of science. However, to do it in a way which would not lead away from this field but which would on the other hand implement the new findings. The "non-philosophical" context to be faced by the authors is represented here mainly by the diversity of the science and technology studies (STS). One of the basic premises of the STS reads as follows: "For scientific knowledge and technological artifacts to be successful, they must be made to fit them. (...) Part of the work of successful technoscience, then, is the construction not only of facts and artifacts but also of the societies that accept, use, and validate them."¹

Therefore, science is not only about studying the world but also about maintaining the cultural and historical competences, i.e. creating a specific kind of society, which is able to deal with the techno-science production. Nevertheless, to build such a society means also to distribute power. Thereby, the complex connections, to which science knowledge immerses, could consequently also become an object of further cognition and critique.

On one hand *Discourse on the Method* (Descartes) and on the other hand discourse *Against Method* (Feyerabend), i.e. traditional philosophy of science turning point works were both restricted by the (self) reflection constrains of the cognition subject, i.e. the mind of the subject. The subject was considered ahistorical and unmarked as a set of universal human sense qualities determined by a similarly ahistorical and unmarked nature. It was the reflection of the "interior". Nevertheless, nowadays the „exterior" seems to be vital as the subject and nature themselves have their own history stated and recognised in the social processes intersection. Therefore, the "context" and the

¹ SIGISMONDO, S. Science and Technology Studies and an Engaged Program. In: HACKETT, E. J. – AMSTERDAMSKA, O. – LYNCH, M. – WAJCMAN, J. (eds.). *The Handbook of Science and Technology Studies*. Third Edition. Cambridge, Massachusetts – London, England: MIT Press, 2008, p. 17 (13 – 31).

“situatedness” are so important to us.² After all, even philosophy could become one of the contexts.

Our inquiry of the particular aspects of the issue is divided into three sections. Nevertheless, the borderline between them is negotiable in the same way as the borderline between texts and contexts.

1. The Scientific Knowledge from the Philosophical Point of View

The first scope resembles the most the traditional science philosophy topics. However, the first paper by **Zdeňka Kalnická** (*Metaphors in Philosophy and Science*) discusses the least “bracketable” philosophy and science exterior, i.e. language. The language always carries and transmits (as expressed in the word „metaphor”) the traces of its social context, e.g. the gender relations. In the first part, the author argues that metaphors play important role in philosophy, and documents her claim by several metaphors of process of knowing to be found in philosophical texts (R. Descartes, G. W. Leibniz, J. Locke, F. Bacon, C. S. Peirce, O. Neurath, W. V. Quine a S. Ullian, K. Popper, S. Haack). There are different views on the relation of imagination (metaphors) and rationality (concepts) in philosophy: the author presents the conception of M. Le Doeuff and T. Leddy. Furthermore, the question of significant differences between the function of metaphor in philosophy and science is raised. The author describes the view of P. Thagard and C. Beam that in the area of science, the metaphor is important in the process of discovery and explanation but in philosophy it also is important in the process of “justification”. To support the author’s view that metaphors are part of broader cultural and intellectual context of philosophy and science the conception of the web of constitutive metaphors of modernity by V. Bělohradský is presented and D. Haraway attitudes, who identified metaphors helping to introduce the model-notion of organism into biology at the beginning of the 20th century, is analysed. These two examples show how a metaphor can function on one hand as the device opening new ways of knowing the world (D. Haraway), and, on the other hand (especially when getting the hegemony over other metaphors) as a limitation of knowing (V. Bělohradský). In the second part of the paper the metaphors that were used by Plato and F. Bacon for the process of knowing are interpreted. In both cases, the metaphors of delivering (giving birth) having a gender aspect, as they are transferring women’s capacities to deliver (give birth to a child) to men’s intellectual (scientific) activity, are found. Also the

² The book and project title was inspired by the work of: SZAPUOVÁ, M. (ed.). *Situovaná veda. Podoby a kontexty tvorby poznania*. Bratislava: Filozofická fakulta Univerzity Komenského, Centrum rodových štúdií, 2009. Roman Rakowski continues in this topic in the end of the present book.

different views (E. Fox-Keller and M. Le Doeuff) on Bacon's metaphors of marriage of man and woman as an analogy to relation of science and nature (man-reason, woman-nature) are offered.

In the following paper **Martin Profant** (*Why a Holy Man Cannot Be Mistaken or Remarks on Wittgenstein's Remarks*) with the help of Ludwig Wittgenstein doubts the universalistic concept of mankind history, which was the bottom line for a part of modern historiography. Wittgenstein's aphoristic remarks on Frazer's *Golden Bough* were written probably in 1931. These remarks were introduced in this paper as an original form of critique regarding not only Frazer's evolutionism but also the entire philosophy of history based on the idea of progress. The historical explanation is a mere hypothesis of the development, it represents only one of many possible forms of perspicuous presentation of the data. According to Wittgenstein this presentation is insufficient, and he prefers another one, i.e. the scheme presentation. Nevertheless, both of the hypotheses, either the development one, or the scheme one, only focus on the similarities and connections between the facts. Therefore, how can someone claim that one of these hypotheses is sufficient and the other is not? The efficiency criterion, which is used by both of the hypotheses to order the facts, does not seem to be sufficient. The hypotheses are not good or wrong, they only more or less resound with the way, we grasp things and word them. Wittgenstein uses the term "Weltanschauung" to speak of this way, it is a term borrowed from Spengler. Wittgenstein stresses the connection between "Weltanschauung" and a term used later on, i.e. the form of life. The form of life term (with regard to language games) represents in this context an original way to understand people from different cultures and times.

In the same time of Wittgenstein's remarks on Frazer, the Vladimir Hoppe's thought emerged; **Lenka Hořínková Kouřilová** (*Vladimír Hoppe and the Natural Scientific Knowledge*) begins her paper with the brief outline of main life events of Vladimir Hoppe. The aim of this paper is to provide a conception of scientific knowledge in the works of Vladimir Hoppe *Nástin sociologického pojetí světa, Podstata, dosah a hodnota přírodovědeckého poznání* and *Příroda a věda: noetika přírodních věd*. Vladimir Hoppe characterized scientific knowledge as fictional, symbolic, hypothetic, approximate and temporary. He focused on noetic problems especially on noetic questions as scientific postulates, axioms, causality etc. Furthermore, the paper deals with the conception of positive philosophy of Vladimir Hoppe that works with intuitive knowledge. Vladimir Hoppe put the intuitive knowledge to opposition to scientific knowledge. According to Vladimir Hoppe the intuitive knowledge completes scientific knowledge. In his work *Příroda a věda* Hoppe mentioned common signs of positive philosophy and religion for the first time. He spoke of them as of powerful manifestation of human soul. He even spoke of philosophy as of first stage of religion in the meaning that it leads human to unlimited sources of the absolute.

If similar attitudes tend to be sometimes considered subjectivist, then there is also a more radical science objectivity challenge by Jean Baudrillard, whose “teori-fiction” to melt even the subject of cognition is introduced by **Tomáš Zemčík** (*Baudrillard’s teori-fiction*). The paper presents Jean Baudrillard’s unique methodological approach, which is titled a teori-fiction in the present paper, and which is supposed to be a working title. Moreover, the distinction between the seductive and productive theory was made and introduced in Baudrillard’s work, where he criticizes it, as well as in different contexts, where he sees the positives of it. Furthermore, the practical usage of teori-fiction was demonstrated regarding the way Baudrillard himself worked with it.

With no less conformist approach than the French philosopher, the Vilém Flusser’s “nomadic” reflections on the knowing and reality relations are introduced by **Martina Špidlová** (*Vilém Flusser’s Street Philosophy*). Flusser’s philosophy is typical of using alternative forms, i.e. fables, dialogues, autobiographical portraits etc. Moreover, his style is influenced by publishing in more languages. As claimed by Flusser, the language creates reality as well as nature and science; therefore, the role of language translation serves him as a way how to grasp reality in a way close to phenomenology. This is one of the reasons why he required throughput not only among languages, but also among aesthetics, ontology, ethics and science. He also defended openness and philosophy in progress, which also complements his claim that philosophy should be nomadic, authority-free, bottomless and open to new stimuli and for everyone. He hoped that the new media society is going to witness these phenomena in the future.

From the heights of the objective reality existence and the human knowledge nature reflections we come down to the everyday science operation, which however does not lack occasional “abnormalities”. One of these is analysed in **Libor Benda**’s contribution (*The OPERA Experiment, Superluminal Neutrinos Detection Controversy, and the “Experimenters’ Regress”*) as he ponders on the recent scientific controversy which took place between September 2011 and July 2012 and whose subject was the outcome of the OPERA experiment, according to which neutrinos could travel faster than light. The controversy is analysed in order to find out whether its resolution was based solely on sufficient scientific evidence, or whether the evidence was insufficient and therefore the resolution was influenced also by some “non-scientific” factors. His point of departure is the concept of the so-called “experimenters’ regress”, developed by Harry Collins on the basis of his sociological analysis of a similar scientific controversy in the 1970s. Collins’ analysis is briefly summarized in the first two sections of the paper and the concept of the experimenters’ regress with all its consequences is introduced. Moreover, in the following two sections the attention is turned to the recent controversy. The controversy is analysed first and then it is demonstrated that it had all the aspects of the experimenters’ regress described by Collins. Furthermore, the question whether the consequences of the regress for the course of the controversy were the

same as those described by Collins in his analysis is raised. It is concluded that this was not the case.

In the end of this section **Marek Petrů** (*Science in the Context of Clinical Medicine*) examines the obstacles, which keep medicine from being a true experimental science. Our ignorance of the natural history of the disease is the most important among them. If we judge the effectiveness of an experimental therapy by comparison with the standard therapy or placebo therapy, as usual, the outcome of the research can be fallacious. Since each illness has its own specific history, we could follow Aristotle, adding that science could only deal with the universal, not with the particular.

2. The Philosophy, Religion and Science Intersections in History

Aristotle is just the thinker to open the second part of the book. The core theme of the section is the delimitation as well as crossing the border between science, philosophy and religion to be observed in the history of knowledge.

Filip Svoboda (*Significance of the Aristotelian Science Concept Regarding Philosophy*) deals with the difference between philosophy and science in Aristotle's thought. Searching for the exact definition of the word episteme seems to be very problematic not just regarding the Aristotle's usage consistence of this term (mainly in *Metaphysics*, *Topics* and *Physics*) but also regarding the frequency of this term's appearance in different contexts. The paper also deals with the division of science according to Aristotle. Moreover, it searches for Plato's influences on Aristotelian systematization of science. The „spiritual” dimension of Aristotle's conception of science might be proven through the Platonic features. The interpretations that consider his conception only in clearly exact terms are abandoned. Aristotle considers philosophy mainly a theoretical philosophy and it seems that these two terms merged into one. The searched philosophy has within the theoretical philosophy an exceptional position, which also corresponds to Aristotelian claims for philosophy and philosophers. The paper intends to show that if philosophy really is science, it is important to know which form this science has according to Aristotle and where its direction is.

Furthermore, the role and the importance of arithmetic at the turn of late antiquity and early Middle Ages are analyzed by **Marek Otisk** (*Arithmetic and God at the turn of late antiquity and early Middle Ages*). The art of arithmetic is not presented only as the ability of basic calculations (e.g. addition, subtraction, multiplication, division, etc.) but the noticeable metaphysical, ontological, gnoseological, theological and anthropological importance of arithmetic in this epoch is also discussed. Furthermore, the role of arithmetic is portrayed on the basis of the Latin tradition texts Aurelius Augustine (*De doctrina Christiana*, *De civitate Dei*, *De libero arbitrio*), by Felix Martianus Capella

(De nuptiis Philologiae et Mercurii), by Boethius (De institutione arithmetica), by Cassiodorus (Institutiones et divinarum humanarum litterarum) and by Isidore of Seville (Etymologiae).

The late middle ages are introduced by **Jana Horáková** (*Interference between philosophical and Jewish religious way of thinking in anonymous letter against philosophy, MS Opp. 585*). Her paper analyses the arguments against philosophy found in a fifteen-century anonymous letter of Ashkenaz origins. Moreover, the content of the letter is set into the historical and intellectual context to answer the question of the clashes between the philosophical and Jewish religious attitudes as far as the problematic issues of the dialogue between the two approaches are concerned.

Vladimír Žatecký (*Between Science and Religion. (Proto)Scientific Aspects of the Occult Philosophy of Heinrich Cornelius Agrippa*) focuses on the Renaissance thinker Agrippa as he discusses the nature and religion regarding their assumed unity. Heinrich Cornelius Agrippa von Nettesheim developed in his philosophy (and in his two basic works – *De occulta philosophia* and *De vanitate*) a systematic view on the natural world but it is still primarily a theologian one. Although there were attempts to explain natural patterns and motions of the material world, his main and final opinion is that God is the top of all human life and activity, and thus it is the first and last question to get knowledge of God and his plan because God is behind and above all the regularities of nature. Agrippa's thinking lies on the border of philosophy, theology and natural science, but the religious feelings and beliefs are clearly the most important ones. Nevertheless, Agrippa is an important scholar and his philosophy has its weight even today, because his holistic approach to the world and life can offer a wide range of materials and questions for a better understanding of magic, which is considered a unifying and all areas of our thinking linking issue.

This approach is not far to J. A. Comenius introduced by **Silvie Gmuzdková** (*Cognition of the World by J. A. Comenius*). Comenius structured the world as an evolution level of the nature, man and God. His belief was supported with the conception of purpose in order to sort existence of each and every being in the World. A man has a special position in this system, because God endowed them with creative power and their role is to fulfil the scheme of the evolution in history and realize the emendation project. This vision of faultless society, which is found in pansophic knowledge, makes Comenius one of the most important representatives of Utopism. The cognition in the gnoseologic triad “sensus – ratio – fides” relates to transcendental sense of the history on Earth, thereby the difference between eschatology and profane history disappears as far as his attitude is concerned. The history is a motion of the soul of human in realization of God intention. Comenius did not consider himself a researcher as far as the knowledge of the nature and not to say the results of the scientific view is concerned but he treated the results regarding their purpose.

The last study of this section (*The Birth of Russian Cosmism in N. F. Fyodorov and K. E. Tsiolkovsky*) by **Lenka Naldoniová** offers another point of view contributing to the idea of science as an instrument of salvation when she remembers the times of the Soviet space exploration program. Russian cosmism was founded on the thoughts of N. F. Fyodorov who influenced the famous Soviet rocket scientist, K. E. Tsiolkovsky, with his „Philosophy of the Common Task“. During the Cold War there was a competition for the conquest of cosmic space between the Soviet Union and the United States. The Soviet Union was proud of their primacy in space exploration at the beginning of the twentieth century. This was due to theories of rocketry developed by Tsiolkovsky. The Soviet government, however, had to hide Tsiolkovsky's philosophy which was tied to religion and God as a first principal and creator of the whole universe. Tsiolkovsky was also connected to Fyodorov's ideas which are part of the project for the future resurrection of fathers. This is why a new resurrected and immortal humanity needs an infinite space. Fyodorov projected as a task of humanity to conquer cosmic space and Tsiolkovsky became the first scientist who began to realize Fyodorov's idealistic theories. The first step is to rule nature which should be regulated and under the control of man. But humanity has to achieve a higher moral state and be bonded by friendship, not by egoistic interests. Only human egoism is a reason why man is still under the control of nature – it means that man needs to eat, to feel pain of illness and to die. Only when the whole humanity will be connected as one, man can overcome even death.

3. Science in Political and Moral Contexts

The third and last section does not deal with the nature of the science as such but the consequences the pieces of knowledge could trigger in the contemporary society are examined.

This discussion is opened by **Miroslava Klečková** (*The Ambivalence of Science in the Perspective of Philosophical Reflection on Totalitarianism*) with a still topical theme of the role of science in the totalitarian regimes. The contribution follows Bauman's theoretical approach to the Holocaust known as functionalism. It is based on the assertion that the Holocaust was determined by the wider social context, especially by the transformation of social organization and by the intensifying confidence in the possibilities of human reason. Bauman's argument is further developed in connection to the ideas of other thinkers concerned with the nature of modern society. The suggestion of ethical contradictions of modern science implies the original problem of human freedom and responsibility.

Furthermore, **Lýdia Blumensteinová** (*Ethical questions of biomedical research*) demonstrates that even nowadays these warning examples should not be forgotten as

she stresses that the ethical aspects of the biomedical research being pushed by political and business interests should not be underestimated. According to the author, in the case of clinical research we should always be cautious. It depends on the responsibility of the researcher who is responsible for ensuring that the results are important for the advancement of science, but also for the fact that everything was done in accordance with ethics. Questions and issues related to the research are endless. Moreover, the contemporary postmodern society people are detached from the generally obligatory value system; this fact makes the above mentioned questions complicated. The phenomenon of morality is sometimes just a tradition. Therefore, the role of medical ethics should be to deepen the humanity and high-quality life arguments. In fact, the harmonisation of individual interests and interests of the others remains the immemorial and unresolved issue of morality. It is obvious that the position of medical ethics in the contemporary philosophy is irreplaceable. According to S. Toulmin the obligation of dealing with the everyday medical ethics problems helps the general ethics to return into a contact with the world of contemporary man.

Kristína Uvírová (*The Political Contexts of the Definition of Justice*) explores in her paper more general moral dilemmas. The analysis of the conceptions of Nancy Fraser and Axel Honneth attempts to blur the border of the scientific ways of knowing as far as the justice issues and their practical usage are concerned. It was intended to link the theories to the real democracy questions with the result of applying the critical theory authors' attitudes to the theory of justice problems regarding the liberalism and communitarism. The author focuses on the social justice issues to demonstrate the practical application of these solutions.

The following study (*Cannot See the Forrest for the Trees. On The Political Aesthetics of the Šumava National Park*) by **Martin Škabraha** provides moral considerations regarding the nature as the scientific knowledge could frame the nature rights. The article deals with the Šumava National Park controversy going on since the foundation of the reservation in 1991. Particular arguments as well as the overall world views of the two main parties of the debate are reconstructed; these are called the Blue and the Green, one representing the local politicians and inhabitants, the other consisting of environmental activists, intellectuals and scientists, usually not Šumava residents. The central issue of the controversy is the bark beetle extension. Human intervention is needed according to the Blue, namely a clear-cut, to prevent the beetle from destroying local woods (mostly spruce monocultures). The Green, on contrary, criticize the intervening for spoiling natural processes and organize human blockade to stop clear-cutting. Exploring these two camps, their views on the bark beetle situation are associated with broader ideological and value doctrines. The Blue insist on a traditional paradigm of a good housekeeper who cannot allow any malefactor (being it a beetle or a human – or a coalition of both) to corrupt entrusted property. The Green

associate this traditional paradigm with a master-like attitude to nature that should be revisited and overcome giving way to a more environmental friendly and respectful coexistence with nature. To reach this transformation of culture we must know nature better, and that entails leaving it to its own ways and manifestations when possible. Resulting from these different world views, a disagreement about aesthetical value emerges— while for the Blue a forest withered away due to bark beetle extension is a symbol of destruction and poor housekeeping, and therefore it is ugly, for the Green it is just a phase in the evolution of life, a part of magical processes of nature. Jacques Rancière's conception of the distribution of the sensible to specify the role of scientific knowledge in the aesthetic evaluation are applied in the conclusion. While in the representative regime science reproduces the given social order under which nature is subordinated to culture, in the aesthetic regime science grants natural elements their own expression and voice, recognising the equality of all the respective agents – trees, beetles, humans and climate.

Nevertheless, is the science as such able to face the ideological pressure? **Roman Rakowski** (*The impact of ideology on the science-pedagogy activity*) closes the section discussing this issue and offering an idea that the academic staff defending the free knowledge idea should be confronted with the socio-economic formation. The core question to be asked is to which extent are the research results influenced by the ideology the scientists live in. The subject of the investigation is the relationship between the research methods and the research evaluation. Last but not least the theory of education, which is tightly linked to the matter of research, is discussed.

Hence, by its very end, our book comes to the conclusion that the seemingly external social context of knowledge appears to be actually its deciding factor.