

**THE RISE AND FALL OF SOCIAL CONSTRUCTIVISM
(Self-Image of Science vs. Public Image of Science: A
Plea for a Complex Image of Science)**

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The subject of the paper is public awareness of science. It aims to discuss the socio-constructivist approach to the public image of science. The paper was inspired by R. Giere's influential idea for a moderate enlightened postmodern synthesis of the existing extreme visions of science - "enlightenment rationalism" and "constructivism" which are identified with modernism and postmodernism (Gieryn 1993; 1999).

*In this paper I argue that it is impossible to obtain an adequate and complex understanding of science practice from the **autonomous** perspective of History of Science, Philosophy of Science and Sociology of Science alone. To be sure, none of these disciplines can tell the whole story, but their joint effort might do.*

1. Introduction

At the end of the 20th century the so-called Science Wars initiated a visible turbulence within the interdisciplinary area of Science Studies and divided historians, philosophers, sociologists and others who theorize on science/sciences into two camps. One camp includes scientists as well as historians and philosophers of science working within the *analytic tradition*, while the other camp consists of many sociologists of science, historians and philosophers of science who appreciate the *continental tradition* in philosophy as well as Cultural Studies scholars drawing on post-structuralism. The last one sprang from literary criticism to evolve into a new cultural and academic theory. Sometimes Science Wars are viewed as a current polemic between humanity scholars and scientists.

What divides nowadays scholars theorizing on science into two camps? There is no simple answer to this question. Generally speaking, this divide originates from the particular periods of the historical development of their disciplines. History, Philosophy and Sociology of Science though neighbouring, but distinct and **autonomous** disciplines, hold a certain body of knowledge, a particular professional language, if you wish a particular jargon, and most importantly *a particular history of their developments*. Because of the autonomous disciplinary theoretical building and developed practices, historians of science are cool to philosophers of science, the latter are cool to sociologists of science and all of them hold some prejudices against the neighbouring field practices. What we need is a preliminary investigation into the practices of History, Philosophy and Sociology of Science themselves from a historical perspective.

A cross-disciplinary comparative and contextualized study of the major epistemological transformations that took place in History, Philosophy and Sociology of Science in the 1930-ies, the 1960-ies and since the 1990-ies onwards might be a helpful exercise aiming:

- to reveal the possible disciplinary limitations of their own visions about science;
- to foster the effort for producing complex understanding of science practice.

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In nineteenth century Germany some prominent natural scientists, in particular physicists were inclined to advance a self-image of science in their public writings, public lectures, rector's speeches and addresses delivered before different scientific societies and scholarly assemblies. The core hypothesis embedded in this self-image of science was that humanism, culture and society should be based on natural science (Paul 1984). Thus the prominent nineteenth century physicists who served as spokesmen for science originated a peculiar tradition and a specific literary genre - philosophical popularisation of physics. This tradition flourished at the beginning of the 20th century, but as C. Carson points out "Its roots go back to the nonspecialist writings of such figures as Helmholtz, Hertz, and Boltzmann, whose excursions outside the purely technical realm were sustained by the Germanic ideal of *Bildung*, which prescribed for the physicist as for other scientists the broader role of the *Kulturtrager*, or bearer of culture" (Carson 1995).

Nowadays we witness persevering tensions between scientists and scholars with regard to the image of science both in society and in academia. Recently public awareness of science became a battleground for the two cultures and a source of alienation between scientific and non-scientific ethos of our culture.

Given the importance of science both in our intellectual tradition and culture, and in society, then what is wrong nowadays with the public image of science? The answer seems to be: **the failure of image.**

For example, G. Holton, pointing to seven false images of science, has analysed their contribution to the current ignorance and indifference between scientists and humanity scholars viewed as the most relevant symptom of the disease of our culture (Holton 1995).

Needless to say, the above outlined state of affairs is highly disturbing. Now an important question arises: who are to be charged with the responsibility for the current failure of science's image and who are to be blamed for it?

From the beginning of the 1990-ies onwards practicing mathematicians, physicists, chemists and biologists as well as philosophers and historians of science working within the analytic tradition, who felt concerned over the problem have found it reasonable to open multiple polemics on the issue (Wolpert 1992; Holton 1993; Weinberg 1993; Labinger 1995; Gross and Levitt 1994; 1996; Sokal & Bricmont 1997, Koertge 1998; Brush 2000, etc.). They argue that certain writings of some professional scholars in the field of History of Science, Philosophy of Science, Sociology of Science, and the related to some extent newer subject matter of Social and Cultural Studies of Science, SSK, STS, etc. have done damage to science by promoting and running a distorted image of science. They identify the root of the evil with a collective obsession of humanist practitioners to deal with **social constructivist/relativist epistemology** applied to science issues. Practicing scientists with a keen sense of intellectual duty begin to promote different self-images of science.

In their turn, some practicing scholars in the stated domains claim that nowadays sciences have become a very different enterprise compared to their Cold War vision. They argue that the advanced self-images of science, being one-sided stories of science, do not correspond to the new economical, political and other realities facing contemporary society, and in fact reinforce the failure of science's image (Collins & Pinch 1993; Pickering 1992; Robbins & Ross 1996; SSS

1999, etc.).

I believe that the current reciprocal attacks coming from both communities, as well as the increasing rate of production of science self-images from the 1990-ies onwards, is indicative of the existence of a real problem (which might be a communicational one or it might be a deeper one as well). In order to grasp the problem in the following two sections I will give a brief account of the intellectual landscape of the 20th c. against which the Social Constructivist Program has emerged.

2. The Intellectual Humanity Landscape of the 20th C

Suppose the following thought experiment. Let us imagine the 20th c. as a “black box” and let us observe and rank into a cluster the most influential intellectual ideas being at its input and its output respectively. This thought experiment is carried out under two initial restrictions: firstly, I consider only inventive intellectual ideas coming from two subject matters – history of ideas and science and philosophy; and secondly – only those ideas which have fed and fleshed up a dominant image of science at their time are considered.

Provided the issue’s setting, one can refer to three major writings at the beginning of the 20th c. whose mutual interplay has shaped a new intellectual trend and had given a strong impact on the formation and emergence of a Nietzschean image of science. I mean here O. Spengler famous *The Decline of the West* which gave rise to a lot of “decline literature”, F. Nietzsche’s *Will to Power* and William James’s *pragmatism*. All of them have initiated a strong criticism of purely intellectual knowledge including scientific knowledge.

For instance, according to Spengler’s dramatic story of the ups and downs of each culture, during the last phase of Western civilisation an attack on the authority of science arises from within its own empire because every conception is at bottom “anthropomorphic” and each culture incorporates this burden in the key conceptions and tests of its own science, which thereby become culturally conditioned illusions. Modern physics, Spengler says, is an exemplification of the will to power because “Nature is not merely asked or persuaded, but forced” (Holton 1993).

The Nietzschean image of science has adopted, articulated and incorporated some key concepts of the new intellectual trend like: of power, of action and a general spirit of intellectual and cultural pessimism toward the social consequences of scientific and technical progress. Within this image of science the question of truth was turned into a basic question of power and an emphasis has been put on the dependence of all truths on the momentary act of the acting individuals.

Let us now observe and check the existing influential ideas and doctrines at the output of our “black box”, i.e. at the turn of the 20th c. Without any doubt, in the case, one can rate **postmodernism** and the French poststructuralist philosophy in particular for a dominant and powerful intellectual trend and a leading discourse which penetrates nearly every humanity discipline. An extreme/radical version of poststructuralist philosophy explicitly defends a Nietzschean image of science.

The outlined thought experiment raises an uneasy and challenging question. Why at the turn of the 20th c. while living under radically changed conditions – mass communication, democratisation of society, etc., the Nietzschean image of science has not only survived but seems to be more strongly intellectually rooted than ever? In other words – Why at the end of the 20th c. like the myth of Sisyphus we find ourselves at its starting point?

Two tentative and opposite speculations and hypotheses might be advanced in order to illuminate the process of delegitimation of science and the *immortality* of the Nietzschean image of science within the “black box”

A major hypothesis: It is an overall and complete process of **ideologization** running in the “black box” which conditioned and conditions the transformation of certain influential intellectual ideas into counter-science culture. The other face of the flight from science and reason seems to be a flight into ideologies. As a rule intellectual ideas are a multi-level and sophisticated conception whereas their ideologized versions are both exaggerated and oversimplified stands.

A counter-hypothesis presumes that not the embracement of ideologies but rather their **breakdown** and the crises of the existing systems of beliefs have facilitated the emergence of counter-science culture. According to it the permanent tension and collision between the helpless individual and an over-powerful society, between the material progress and the crisis of culture, and the common shared sense of confusion and lack of society perspective among its members have fertilized the ground for revival of irrational thinking at the turn of the 20th c.

3. The Rise and Fall of Social Constructivism Program

The Social Constructivist Program that emerged in the 1970's argues roughly speaking that the influence of social factors extends to scientists' theories of explanation, i.e. the very knowledge produced by scientists ingrain the peculiarity of its social environment.

The Social Constructivism (SC) is not a kind of consistent theory or model, but rather a kind of methodological orientation, movement, path of thought, etc. that dominated the research in the field of Science & Technology Studies (STS) during the last 30 years.

Let me remind you briefly of the rise of the SC. This influential intellectual movement had three founding fathers.

At the beginning were Tomas Kuhn and his book *The Structure of Scientific Revolutions*, 1962. (Later T. Kuhn expressed his disagreement with the SC Program and drew a line between his views and the SC vision about science dynamics.)

The second founding father of the SC was Paul Forman (a student of T. Kuhn) and his study *Weimar Culture, Causality, and Quantum Theory, 1918-1927: Adaptation by German Physicists and Mathematicians to a Hostile Intellectual Environment*, 1971. This study became a kind of Bible for the adherents of the SC movement.

The real founding father of the SC, however, was David Bloor and his study *Knowledge and Social Imagery*, 1976. By background T. Kuhn and P. Forman are physicists, while D. Bloor has a background in the field of experimental psychology. He is a representative of the new generation sociologists of science (SSK, Sociology of Scientific Knowledge) who came to replace the classical sociological school of Robert Merton. D. Bloor founded his own school, the so-called Edinburgh school of the SSK and developed the well-known “Strong Program” and its reduced version – “The Principle of Symmetry” in Sociology of Science.

Let me also try to summarize briefly the main assumption as well as the main features of the SC Program. As far as SC writings do not represent a unified conception but rather a great diversity of approaches to science as human enterprise, I will draw on the shared elements in these writings.

Some Assumptions of the SC Program

1. Science is not self-reflective, it is incapable of knowing itself;
2. Sociologists and maybe philosophers can understand science enterprise better than scientists themselves do – even if they have never participated in scientific research but simply live in a society that is largely constituted by modern science;
3. New sociologists reject the conventional premise that natural sciences are “harder” and their results are more reliable than these of humanity sciences.

Some Features of the SC Program

- Emphasizing the *social collectivity* of knowledge. This notion is considered crucial from the perspective of knowledge production in the practice of science.
- Viewing scientific research as a *form of practice* and the scientific enterprise as a *cluster of practices*.
- Viewing language as a tool for knowledge production as well as a tool for manipulation; paying attention to the rhetoric and semiotic dimensions of the language.
- Viewing science as a *part of culture* that may be studied like any other socio-cultural phenomenon.
- Practicing methodological relativism (Relativism means here first and foremost *contextualism* (relationism) and not philosophical (ontological) relativism).
- Problematizing and questioning the *subject-object* opposition of classical epistemology.

The following graph, drawn by the historian of science Stephen Brush, gives a visual representation of the rise and fall of the SC Program (Brush 2000). He has searched for publications in History of Science, Technology and Medicine in the RLIN electronic database under the key word “social constructivism”. According to his findings the peak in the SC in the early 1990s has been followed by a rapid decline.

The Graph must be placed here

4. The Lessons to be Learned from the Social Constructivist Agenda

In this section I will draw on the weak as well as on the strong points of the SC Agenda from the perspective of History & Philosophy of Science.

Firstly, there is no conventionally accepted and commonly shared understanding of the issue among the SC community of how to define the social dimension of scientific knowledge. As Jan Golinski has noted “Although the adjective “social” is frequently used to qualify constructivism, there is in fact no unanimity as to how the social element in the making of scientific knowledge should be specified or what explanatory role should be ascribed to it” (Golinski 1998).

Secondly, the majority of Social Constructivists do not carry out specified historical studies in order to explicate how in the course of time the social environment has influenced the production of scientific knowledge. In this connection I would like to stress that P. Forman's work on "Weimer Culture" has been highly acknowledged because of its documentary evidence, while the SC writings lack similar documentary evidence.

Last, but not least, the Social Constructivists are not inclined to test their hypothesis, i.e. to study the evolution of science and the growth of scientific knowledge in societies with different cultural and political traditions in order to identify the presupposed differences.

Recently the historian of science Loren Graham applied D. Bloor's Principle of Symmetry to his research on Russian science and put to the test the "social constructivist" thesis in the STS (Graham 1998).

The Strong Points of Social Constructivist Agenda

1. SC shifts the research focus from science content to science context and sets its content into context. Emphasizing context over content gives rise to expectations that our academic theorizing on science can become more reflexive and reinforces our sensibility about historical contingency. A similar disciplinary shift towards *contextualism* took place in History of Science still in the 1960's and only recently became a subject of research interest and investigation in the field of Philosophy and Philosophy of Science as well (Friedman 2000; McCumber 2001).

2. SC shifts the research focus from the "big picture" to the "small picture" in History & Philosophy of Science.

3. SC drops the philosophical issues of truth and rationality out of its Agenda.

Recently the philosopher of science Ronald Giere embedded some strong points of the SC Agenda into a new program in the field of philosophy of science – *naturalism*. This program "gives up the search for criteria of scientific rationality, abandons the attempts to separate the content and methods of science from psychological and sociological reality, but preserves the view of science as a representational activity" (Giere 1999). R. Giere argues "that the very categories in which the Enlightenment view of science was formulated are inadequate to capture the actual practice of science, both historically and in its contemporary forms. Concepts like those of laws of nature, truth, and rationality are not givens, but are themselves interpretive categories which have their own histories. Science need not be understood in these terms and, indeed, may be better understood in other terms" (Giere 1999). The fundamental concept in his particular understanding of scientific practice is that of *a model*.

4. There are indeed links between some points of the SC, Postmodernism on the one hand and the Copenhagen Interpretation of Quantum Mechanics and the so-called measurement problem in this contemporary physical theory, on the other hand. In addition, a kind of physical *holism* gleams from the philosophical discourse of the current stage of Einstein-Bohr controversy on foundational matters of Quantum Mechanics (Sretenova 1998).

Concluding Lines: A Plea for a Complex Image of Science

The core idea of this paper is that it is impossible to obtain an adequate and complex understanding of science practice from the **autonomous** perspective of History of Science, Philosophy of Science and Sociology of Science alone. To be sure, none of these disciplines can tell the whole story, but their joint effort might do.

I propose to study the **context** of disciplinary theoretical building and practices of the above noted neighbouring disciplines during major turns of their historical development.

Why is the broader socio-cultural and political context of times, provided it is historically contingent, so important for disciplinary building and practice in the fields in question? My tentative hypothesis is that a given historical context leaves an implicit trace in the disciplinary practices of History, Philosophy and Sociology of Science. In the course of time, a particular historical context ceases to exist, while the ingrained trace persists to become a part of disciplinary Orthodoxy.

I believe that these implicit traces can be identified, explained and possibly eliminated from the disciplinary practice in the fields in question.

A comparative and contextualized cross-disciplinary study of the practices of History, Philosophy and Sociology of Science from a historical perspective can explain the origin of their particular limitations when approaching the common subject of their study - the understanding of science and its practice.

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