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Posthumanist Tendencies in Science and Technology Studies

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Summary

The article discusses posthumanist tendencies occurring in the so-called Science and Technology Studies (STS), concentrating mainly upon B. Latour's Actor-Network Theory (ANT). Postconstructivist conceptions within STS emphasize the crucial role of material situatedness of technoscience that is dependent on non-humans in laboratory practice (allowing to extend and "delegate" cognitive capacities to the environment). What is more, ANT accepts the radical thesis of non-human agency.

The text also analyses a larger posthumanist political trend present in STS and in other theories, rejecting the arrogance of modern scientific anthropocentrism. It emerges as an inevitable reaction towards the problem of possible ecological destabilization (modern systemic risk or axiological/political challenges created by the so-called "wet" technologies, such as biotechnology, biomedicine, pharmacology).

Introduction

The main aim of the article is to discuss posthumanist tendencies occurring in the so-called Science and Technology Studies (STS). STS, initially also referred to as the Sociology of Scientific Knowledge, which have been developing since the 1970s stem from the so-called Strong Program in the Sociology of Knowledge of the Edinburgh School. Over the course of the last decades of the XXth century, the Sociology of Scientific Knowledge was deeply transformed by the "turn to technology" and then the "turn to things" articulating an important role played by non-humans and ontological hybrids in the history of humankind – particularly in laboratories. The text highlights selected STS's posthumanist assumptions and theses that appeared in this context. I describe them as a form of postconstructivism. Postconstructivists within STS emphasize the crucial role of material situatedness of technoscience that is based on non-humans in laboratory practice (allowing us to extend and "delegate" cognitive capacities to the environment). This standpoint accepts the radical thesis of non-human agency and appreciates the significance of non-humans.

Presently, posthumanism in Science and Technology Studies may be also identified with a tendency to reject the arrogance of Western scientific an-

thropocentrism. Posthumanism of this sort seems to be motivated politically. Currently it is also gaining prominence in many other fields of social science (such as sociology of risk or ecological politics). In these contexts humanism is criticised as being partial and ethically controversial, but also as inadequate, unsatisfactory and politically dangerous.

New forms of political thinking expressing strong disappointment in the anthropocentric paradigm originate from a reflection on the undesirable consequences of practical success of science, technology and industry in the last decades.[1] The disappointment of this sort seems to be an inevitable reaction towards the severe problem of modern ecological risk on the one hand and axiological challenges created by the so-called "wet" technologies: biotechnology and biomedicine on the other. Such a political kind of posthumanism will be analyzed in the final section of this article.

Diverse Faces of Posthumanism

In the first part of the article we should distinguish other possible forms of contemporary posthumanism, indicating their most significant features. Unfortunately, there is no place in this article to extensively and profoundly discuss the historical origins and theoretical detail of these standpoints. But still, differentiating the most well-known forms of posthumanism will allow us to provide a clear definition of posthumanist tendencies present within STS. We must enumerate here the following possibilities: 1) transhumanism, propagating the idea of human enhancement (bioliberalism), 2) bio-conservatist critical reaction towards extended usage of science and technology, 3) posthumanism inscribed in animal and plant studies. We may describe the first position as techno-enthusiastic (and ultraanthropocentric), the second as techno-phobic (and sentimental), and the third as balanced.

Transhumanism is presently articulated and defended by such thinkers as James Hughes (2004), John Harris (2007), Nick Bostrom and Julian Savulescu (Bostrom 2005, Bostrom, Savulescu 2009).[2] These authors optimistically assess the current effects and the possible future results of informational, biotechnological, pharmacological and biomedical revolution. They hope that new technoscientific methods of enhancement may radically improve human nature (for example: health, lifespan, sensitive and cognitive abilities). In the text *In Defence of Posthuman Dignity* Bostrom points out that transhumanism should be interpreted as 'an outgrowth of secular humanism and the Enlightenment' (Bostrom 2005, p. 202). Human enhancement techniques (like genetic engineering, information technology, machine-phase nanotechnology, artificial intelligence, and fully immersive virtual reality that is still only anticipated) are seen as a chance to increase control over our mental and physical states,

1 I identify the success of science with reproducibility of experimental results and the effectiveness of technology.

2 Important previous formulations of transhumanist ideas can be found in the article *Cyborgs and Space* (Clynes, Kline 1960) and a book by Robert Pepperell titled *The Posthuman Condition: Consciousness Beyond the Brain* (Pepperell 1995). Nathan Clynes and Manfred Kline, in the text mentioned above, introduced the term of cyborg as a self-regulating man-machine hybrid.

and also as a form of extension of human capacities. According to a transhumanist perspective, humankind can legitimately reform itself in accordance with human values, enabling us to project and create a more inclusive society and better politics as a result. Obviously, this new form of humanity created by technology can also possess (superhuman) dignity.

Among the bioconservatists whose works are widely known and commented we will find Jeremy Rifkin (1983), Francis Fukuyama (2002) and Michael Sandel (2007). From its beginnings, bioconservatism has been formulated as a dispassionate or even cold reaction to enthusiasm to new potentialities and innovations created in laboratories. According to bioconservatists we should always stay prudent and cautious as human enhancement technologies and unwanted potentialities opened by laboratories may irreversibly reshape our nature and therefore undermine human dignity. These philosophers stress that the secular Enlightenment and "progress" might create dehumanizing effects if its products are used inappropriately. As they put it, we should not attempt to *play God*.

I would like to underline that the value of cautiousness does not have to be favored solely by conservative thinkers. For example, there is an ongoing debate about the necessity to fully implement into global systems the so called Precautionary Principle. This principle enables us to place ethical and political considerations at the very core of research programs (Andorno 2004). Religious metaphors or essentialist arguments concentrating upon the unique ontological status of human nature or natural law are not the only ones used in this debate. To take one example, Jürgen Habermas, proposes that we open our ethical and sociological imagination to the possible destabilizing legal and socio-political consequences of laboratory interventions (Habermas 2003).

Finally, also animal and plant studies may be interpreted as posthumanist. They emerged as a branch of cultural studies in the last decades in the USA and frequently have their roots in animal rights theories. The best-known representatives of this approach are Donna Haraway (2003, 2008), Barbara Herrnstein Smith (2004), and Cary Wolfe (2009, 2010).[3]

In his article *Human, All Too Human: "Animal Studies" and the Humanities* (2009) Wolfe points to the main objective of animal studies: the aim is not to extend human sensitivity to another marginalized group but to transform the current vision of mankind. Animal studies do not simply create traditional stories about animals as tropes, metaphors or symbols that belong to human culture, but they finally enable us to rethink the human/animal distinction. In this intellectual project no distance can be maintained: the author analyzing animals must be reshaped as well, becoming a new subject (Wolfe 2009, p. 569). Animal studies are "riveting our attention on the embodied finitude that we share with nonhuman animals" (Wolfe 2009, p. 570). Both animals and humans are

3 What is worth mentioning, all of these authors make comments on Jacques Derrida's philosophical analysis of the notion of Animal identified with a victim within the framework of Western ontological dualism (Derrida 2002, 2003).

treated as equal subjects of research as mortal, material, sensitive to suffering, vulnerable and situated entities.

Haraway's achievements are especially important in the context of the problem of posthumanist tendencies within STS. She is an author who identifies herself not only with the field of science studies, but also with critical, antiracist research programs and multicultural feminism (Haraway 1994, p. 65). In her writings she propagated the term "cyborg" along with the anti-anthropocentric metaphor of a dog. Introducing such notions as "naturecultures" or "companion species" Haraway tries to situate her narrations beyond traditional philosophical dualism or essentialism. For example, in her book *When Species Meet* she tries to focus on the possibility of sharing suffering by humans and other species (especially laboratory animals and animals that are killed as industrial organisms). She proposes not regarding animals as objectified victims and she reformulates the question of responsibility towards them.

Postconstructivist Phase of STS

As I have tried to argue elsewhere, current research carried out within Science and Technology Studies may be identified to a great extent as a specific form of postconstructivism (Bińczyk 2010, 2013a). The originality of this stage of evolution of constructivism lies in the fact that it attempts to model laboratory practices as: 1) materially located, ensuring practical effectiveness, 2) empirically underdetermined (which implies rejecting the excessive epistemological claims of representationalism), 3) institutionalized, according to standards and criteria that are historically contingent (which, in turn, implies dismissing the fundamental assumptions of essentialism), and 4) modeled in accordance with certain realistic intuitions (I mean the version of realism which I describe as "trivial" or "banalized"). The positions of the following authors may be considered postconstructivist in the sense mentioned above: Latour's Actor-Network Theory (ANT) (1987, 1999), Pickering's conception of the so-called "the mangle of practice" (1992, 1995), Karin Knorr-Cetina's ethnography of laboratory (1981, 1995), Ian Hacking's new experimentalism (1992, 2000).[4]

Postconstructivism may be characterized by a critical distance to the thesis of the *social* construction of reality. Simultaneously, the importance of non-human factors comes here to the foreground. Instead of concentrating solely on the institutional dimension, the above-mentioned authors put a clear emphasis on the importance of laboratory, practical, instrumental and experimental context of science, pictured as located in a material world.

Postconstructivism accepts particular version of so-called Duhem-Quine thesis of underdetermination raising the problem of an unproblematic location of a falsified element during scientific procedures of falsification. What STS emphasize is a wider phenomenon of underdetermination of laboratory *practice*, and not only the issue of underdetermination of scientific theory by empirical evidence (Bińczyk 2013a).

4 They seem to be in conformity in this respect with other views of such STS representatives as Wiebe Bijker, Trevor Pinch, Thomas Hughes or John Law.

The postconstructivist description of technoscience uses the concepts of adaptation, interactive stabilization and robust fit instead of the notion of representation. The use of these categories allows us *not* to think of cognition in terms of its final results (such as a ready-made theory that represents or does not represent reality). Cognition is thus regarded as a dynamic, *located* process (of interactive stabilization of the results of scientific work) which can always be revised. The adaptation may take on many different forms which benefits may be evaluated according to different criteria.

Based on the results of STS it can be claimed that: 1) understanding the phenomenon of theorizing requires the consideration of the role of bodily and physical situatedness of the knowing subject and the meaning of its tacit knowledge and practical skills, 2) abstract thinking would be very limited if it were not for the ability to "delegate" cognitive competences into the environment, 3) getting sophisticated cognitive results happens through the use of instruments, prototypes, diagrams, writing, drawings, tables, maps and other non-human factors.

According to postconstructivists it would be impossible to make complicated calculations without using a sheet of paper, an abacus or a set of coordinates. It would be difficult to imagine the DNA structure without a model build with colored wires and balls or computer simulations. Due to the innovations that enable to extend or "externalize" the mind into the environment, we can observe relations, compare results and prepare more precise and longer argumentations. Quite importantly, the only stable and lasting results are those that we have learned to "externalize" into the surroundings. Such mechanisms of "externalization" are widely employed in technoscience, whose history is, in fact, the history of innovations aimed to externalize cognitive functions (Giere, Moffat 2003, Latour 1986).

This anti-essentialist approach, questioning the epistemological representationalism, convincingly locates the conditions of practical success of laboratories. In laboratories we create the possibility of reducing the complexity of the environment, we can duplicate trials and errors while reducing their costs. STS meticulously reconstructs the relationship between tinkering and theory, between science and technology, both in terms of theoretical, pragmatic, institutional and finally economic aspects. As we have seen, it models science in a non-standard way, by combining instrumentalist, constructivist and realistic premises.

Non-human Agency in the History of the Global Risk Society

Latour's ANT, assessed as one of the most ambitious theoretical projects within STS (Sismondo 2010, p. 92), describes the crucial role of non-humans in the processes of collective human integration and coordination. Objects and technological infrastructures stabilize and consolidate society, contribute to social relations as well as embody moral standards, discrimination or political oppression. According to Latour, various competencies, dispersed action, and even cognition or intentionality are

distributed onto things that are not only simple carriers of meanings or passive tools of human activities. They act themselves autonomously when they define, enable or blockade human action (Latour 1991, 1997). Weapons of mass destruction create new forms of global politics. Frozen food reconfigures what we call family and leisure time and transforms women's identity. Artificial limbs can change sport and the definition of doping. Photographic techniques or the construction of a bridge may perpetuate racist social hierarchies (cf. Winner 1986).

Once invented and incorporated, infrastructures create inevitable conditions for other constructions and actions. Every successful innovation involves an in-depth transformation of the collective life in many of its aspects (material, financial, legal, normative). This is why non-humans should not be interpreted as single items or innocent gadgets, but rather as hybrid networks with a strong potentiality to destabilize surrounding areas. Artifacts and infrastructures co-created humanity, embodied our norms and values and they still do. This is why while describing the role of objects and technology, we do not have to veer off the beaten paths of technological determinism or pessimism (depicting the processes of alienation of man in a technological civilization).

Nevertheless, in the context of enormous complexity of global contemporary connections we observe more and more surprising side effects, that are often visible in very remote areas. Societies have to deal with instability of heterogeneous networks of relationships between various ontological elements. A new form of risk – *modern systemic risk* is therefore a distinctive consequence of globalization and techno-industrial evolution (chemical, biotechnological, biomedical or pharmaceutical) (Beck 1992, 1995).

Modern systemic risk causes many epistemological, social and political problems. It is always axiologically conditioned. *At the same time* it is real and virtual, discursive – socially constructed. In a risk society, in which a game about positions that enables defining certainty and threats takes place, the status of science, empirical evidence and expertise undergoes some interesting changes. In the time of the loss of public trust and numerous non-conclusive controversies the role of an expert also changes. We observe expert knowledge that is politically instrumentalized in controversies. Doubts and uncertainty are also professionally produced and commissioned. The experts (from whom we cannot resign) are not perceived as independent, but very often involved in conflicts of interest. All these processes are pictured by many interesting research results of *Public Understanding of Science* (PUS) – a field that emerged in STS in the 1980s.

Beyond Essentialism: Posthumanism in the Epoch of Risk

In the year 2000 a well-known ecologist Eugene F. Stoermer and a climatologist Paul J. Crutzen proposed to call the current geological era "anthropocene" (Stoermer and Crutzen 2000). The main reason *for this* was the current scope of industrial transformation of our planet - *its* water systems, soil and atmosphe-

re. Surprisingly, when humanists intensified the debate about posthumanism, scientists proposed the term "anthropocene". We live in post-natural age, post-environmental era of "anthropocene", because there is no undisturbed Nature.

In his book *Politics of Nature* (2004), Latour redefines the project of ecological politics as the one that can no longer be understood as a fight for abstract and essentialist Nature. Instead, we should focus our efforts on trying to achieve harmonious future. The French sociologist replaces an old category of "society" (created only by humans and social relations) with a more convenient notion of "collective", constituted by humans and non-humans (other species, ecosystems, infrastructures, things), linked by heterogeneous bonds. Humans and non-humans are interconnected and interdependent. This constitutes the reason why (post)humans must stop being anthropocentric. We should create The Parliament of Things providing the possibility for political representation of non-humans as well as protection of the interest of future generations.

The current transformation of the category of Nature and the processes of hybridization require a diagnosis. It is difficult to carry out such a diagnosis using classical essentialist categories (cf. Bińczyk 2013). If Nature itself may be legitimately understood as an artifact or a human construct in a trivial sense, the constructivist framework may prove to be more fruitful and ethically desirable than essentialism. Within constructivism we may conceptualize scientific efforts as contingent *constructions* made for the sake of the public, and, as such, not inevitable in its current form.

The successes of laboratories testify that so far sacred dualisms (nature-culture, body-machine, subject-object, tool-living organism) are not absolute in their character. "Wet" technologies cause our traditional essentialist categories to become out-of-date, creating a situation where the traditional, "ontological hygiene" is no longer attainable. Traditional ontological framework seems inapplicable to such hybrid, transgenetic entities, as Flavr-Savr tomatoes, *Oncomouse TM* or fluorescent pigs.

Essentialism assumes the existence of ahistorical, pre-given essences of things that constitute their identities. The aim of our cognition in this perspective is to disclose these essences and the act of disclosure is seen as innocent and non-manipulative. The acts of cognition are treated as ethically legitimated, because expanding knowledge is always in the interest of humankind. Within this framework the ontological differences between nature and culture, facts and values, basic science and its technological application are regarded as pre-given and easily recognizable. However, in laboratories we not only reveal, but also manipulate, intervene and create unknown possibilities. This is why scientific knowledge can no longer be interpreted as an unproblematic common good. Rejecting the belief about the political neutrality of laboratory amounts to abandoning essentialism.

A scientific vision of progress rooted in the age of Enlightenment imposed severe limitations on our imagination, as a result of which we cannot envisage any alternatives (and therefore must accept the inevitable pursuit of continued gro-

wth, new discoveries and innovation). At the same time, we believe that environmental damage may be averted in the future, which justifies our passivity.

Politically motivated posthumanism in the era of risk states that we must think about the existence of adverse consequences of the success of technoscience in a new, non-standard way. It undermines widely accepted beliefs about the status of non-human actors, the nature of the relation between society and technology, dynamics of social change, role of laboratories and the factors which determine the effectiveness of technology. So far, we have tacitly been aware of the existence of unwanted consequences of our own actions but in the era of modern risk we are pressed to respond jointly, taking into account the intertwined fate of people, non-humans and our planet as a whole.

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