Science and Technology Studies Engagements with the Influence of Eugenics on Medicine

Barna Szamosi

In this paper, the field of science and technology studies (STS) is used to discuss the eugenic influence on medicine. The first line of inquiry explores the way social values are inextricably connected with technological development. It addresses issues related to the influence that social values, and in particular eugenic values, had and still have in medical processes. The second line of inquiry concerns the role that technological tools have played in the realization of political-medical goals. Regarding this problem, the most important is to look at processes that help us to understand how medical technology has been used to shape the public health standards of the population. The aim is to provide an understanding whether there is any possible discrepancy between the aim of an egalitarian medical discourse with its goal of health optimization and the actual outcome of public health policies and the medical practitioners' activities. An STS informed research can be helpful in pointing out in what ways eugenic values can come back into medical practice.

Articulating the field of science and technology studies

Science and technology studies as a field emerged in the late 1980s after the publication of the work of Bruno Latour *Science in Action* (1987). The term itself refers to the intention of philosophers of science to bridge the gap between the traditional view about the subjects of science and technology. In the conventional approach, it was thought that science deals with facts while technology deals with artifacts. The aim of researchers was to develop a new framework that is inclusive regarding the interrelatedness of the way facts and artifacts are produced. According to László Ropolyi (2013), who is a philosopher of science, Latour can be viewed as an empirical philosopher whose methodology and theoretical approach enables him to create hybrid entities through the interpretation of the interactions of scientific research, with various actors in such a research, and the social environment that surrounds any scientific activity. In addition to these, it accommodates both human and non-human actors, economic and political categories as well. With this approach the classic realist view, that scientific research is the way to discover

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how things universally are is displaced. Scientific knowledge is socially constructed through the dynamic networks of human and non-human elements and as such the knowledge produced is never value-neutral.

To paraphrase Sergio Sismondo (2008, 14), who is a historian and philosopher of science, a standard review of science and technology studies can plausibly start with a reflection on the classic and widely cited work of Thomas S. Kuhn originally published in 1962 entitled *The Structure of Scientific Revolutions*. In his work, Kuhn reveals three qualitatively important characteristics of scientific knowledge production: (1) epistemological communities are the basic elements, (2) the scientific knowledge that they produce is perspectival, and (3) scientific knowledge production is a dynamic, active process where participants performatively engage in constructing scientific information. Kuhn's work was a capstone essay for sociologists of scientific knowledge whose aim was to draw on his insights and expose the myth of value neutrality in scientific knowledge structures. In the Anglo-Saxon academic world the field of science studies started to emerge centralized around the question: whether sociological or philosophical approaches are best suited to study scientific knowledge production. These early science critiques, developed into the field of sociology of scientific knowledge (SSK) already successfully destabilizing the belief in conventionally understood objective science (Woolgar 2004, 345). David Bloor (1976) and Barry Barnes (1974) in developing their theory, called the strong program, in the field of SSK used Kuhn's work as their starting point (cited in Sismondo 2008, 14). They began from the problem of naturalization of scientific knowledge to work out possible alternative explanations for its production. Their method was interested in going beyond the asymmetrical explanations of scientifically true and false knowledge. They have shown that cultural values enter into scientific knowledge production. Both traditional history and philosophy of science work with the assumption that only rational scientific knowledge is true which entails that a methodologically rigorous value-neutral scientific project will produce true universally applicable knowledge. This epistemological position implies that researchers pursuing scientific truth will also avoid the production of false scientific knowledge.

Early feminist science studies criticism focused on the place of women in science, sexism in scientific knowledge construction, and other gendered perspectives that shape the production of scientific knowledge. Initial historical works were soon followed by critical contributions to the field of sociology of scientific knowledge where scholars like Nancy Hartsock (1985), Sandra Harding (1986), Donna Haraway (1988), and Helen Longino (1990) were interested in working out theoretical frameworks that make possible the reconceptualization of traditional scientific ideas such as objectivity, value neutrality, and universality. Despite their

explicit commitment to social constructionist frameworks that prioritize the discursive signifying practices of the epistemological communities, their aim was to retain some form of connection with materiality. Despite this commitment to avoid the exclusion of materiality, the initial ideas that can be traced back to the mid-1980s urge scholars to rethink human relationship to materiality; the material turn, in other words, the onto-epistemological spin in feminist science and technology studies occurred only in the first years of the twenty-first century.

Feminist scholars were working in the field of SSK from the late 1970s and by introducing gender into the field, they extended the scope of research. By explaining the role of gender in science, they made it necessary to reflect on the gendered positions of the researchers that contributed to the incorporation of gender based perspectives in traditional scientific knowledge production (Hekman 2008, 89). The concepts which are developed by feminist scholars in connection to SSK critique – and still used in some form in science studies – are strong objectivity, standpoint theory, and situated knowledges. Standpoint theory was developed by Dorothy Smith (1987), Donna Haraway (1988), Patricia Hill Collins (1991), and Sandra Harding (1993) as a response to the scientific relativism inherent in the strong program of the SSK. In their works, standpoint is a politically constructed position, only those agents have access to the political standpoint who participated constitutively in its formulation. In this sense, standpoints are necessarily interest-based positions. They are formulated from specific places in a social context, researchers experience and view the world from these particular positions. Developing this strand of theorizing further, Sandra Harding, who is a feminist philosopher of science, proposed the concept of strong objectivity in order to retain the values associated with objective scientific conduct, but also to avoid scientific relativism, that would emerge from the locatedness of standpoint theories. Harding argued for the explicit integration of values and social positions into scientific research projects in order to maximize scientific objectivity. In relation to this argument, Donna Haraway (1988), who is a biologist by training, also proposed a related concept, situated knowledges, in order to describe the embodied, socially embedded, value-laden, and perspectival character of scientific knowledge production. Haraway proposed, similarly to Harding, that to do socially relevant, sensitive, and empowering science, scientists must not only avoid abstracting their work from the everyday experiences of people but must produce applicable/useful non-universal, that is, local knowledges directly to them. Despite the extensive work of feminist science criticism which was largely written in the style of social constructivism, scholars could not convincingly move beyond the discursive, or linguistic turn that dominated science and technology studies after the 1970s in order to deconstruct the nature/culture divide, which was problematized in feminist scholarship from the 1950s.

The intention to include the material environment in the theorizing of scientific knowledge production appeared in the work of Bruno Latour and Steve Woolgar in the late 1970s. In their essay, *Laboratory Life* (1979), they used anthropological methods to explore the construction of scientific facts in the context of the lab. They designed their project in the hope of developing further the principle of reflexivity of the strong program and they worked out the methodologies here that later other science and technology scholars applied in their research (Kutrovácz 2013). A significant change in the field of science and technology studies research occurred after the publication of Latour's *Science in Action* (1987). In his work, Latour argues, that studying scientific research, the traditional subject-object dichotomy that is present in history and philosophy of science, and in the natural sciences, poses a crucial problem. According to him, the problem with the standard constructivist position is that it views things as independent material units, which are not constitutive elements in scientific knowledge production. Latour challenges this position by arguing that science studies scholars must see the networks of human and non-human actors as equally constitutive elements in scientific conduct, scholars must imagine things as imbued with values that in turn play a role in the construction of scientific knowledge (Latour 1987; Ropolyi 2013). Parallel to the inclusion of things, Latour articulates the so-called actor-network-theory (ANT) which is capable of addressing and analyzing the role of human and non-human actors in the networks of knowledge production. Actor-network theory is later developed further by Latour himself (1993, 1999) and by many other scholars, among these are John Law (1994), Annemarie Mol (2002), and Karen Barad (2007).

The original aim of Latour and Woolgar was to succeed in addressing scientific knowledge production in a novel way that SSK was incapable performing. Despite the close connection of the ANT to sociology of knowledge leading theorists of SSK heavily criticized their approach (Collins and Yearly 1992; Bloor 1999). Latour defending the achievements of ANT, claims "[i]f ANT can be credited with something, it is to have developed a science studies that entirely bypasses the question of 'social construction' and the 'realist/relativist debate'" (Latour 1999a, 22). In his words, "the collective scientific reality is a circulation of transformations," which as he writes material, social, and narrative at once. With ANT science studies scholars are provided with a theoretical-methodological perspective to think through the interrelations of technology, science, and society. The term technoscience, refers to the inextricable nature of technoscientific knowledge from the social sphere. Since the early 1990s the technoscientific approach has dominated the research field of science and technology studies, which is visible from the terminology used by scholars referring to the intermingled nature of

their research: biomedicine, biotechnology, technopolitics, molecular biopolitics are such instances to name a few.

Woolgar emphasizes among the most significant contributions of STS that it deconstructed the boundary between the scientific and the social and between the social and the technological (Woolgar 2004, 345). Then he argues that this contribution implies a crucial point: in contemporary STS discussions, the hardest possible case to address is politics. "STS told us that technology is politics by other means. […] If politics is a latest hardest possible case, it means that an STS perspective on technology must be central to any analysis of political life" (Woolgar 2004, 346). Woolgar's standpoint positions biotechnologies as biopolitics, and argues that as such provides a crucial field for STS critical interventions. Drawing on these theoretical insights this paper will show how social values have shaped biomedical research and practice, and it points towards the idea, that biomedicine is still affected by the historical heritage of eugenics.

The molecular governance of biomedicine

In his groundbreaking work *Birth of the Clinic* (1976 [1963]), Michel Foucault's intention was to explore the discourses which shaped the ways in which the data of medical scientific phenomena were obtained. In other words, Foucault's aim was to problematize, to think through how they came about, and point out how they were constructed and subsequently became naturalized. Hence, he was analyzing the material-discursive conditions that lead to the production of the normal, deviant, morbid, and sick. This is what he terms 'effective history' (Foucault, 1986; see Dean, 1994; cited in Philo, 2000) of the conditions of existence. In order to understand the process of medical knowledge production, Foucault distinguished between three shifts, primary, secondary and tertiary spatialization of disease that contributed to the articulation of what he termed anatomo-clinical gaze. In the first shift, called primary spatialization, Foucault described the practice of collecting, classifying, grouping, and hierarchizing diseases, during this mapping process, medical professionals of the eighteenth century placed diseases according to their appearance on the surface of the body. The secondary spatialization was explored by him through contrasting the writings of the first phase with the writings of the nineteenth century medical professionals. As a result of the comparative work, he concluded that the second phase was concerned with placing diseases within the body, as a result of the shift in medical thinking, the focus of interest changed from imagining diseases as abstract categories, to exploring the processes how these medical problems were taking shape. From this time onwards, the

medical professionals' work was to subject the patients' body to the technologically available most rigorous medical scrutiny, not only to look at the body, but to look into the body. The aim was to confront the embodied nature of disease by directly addressing the problems through getting as close as possible to the cause of suffering. This anatomo-clinical gaze wanted to grasp the dynamic changes that occurred in the body, the time-space configurations of the disease. And the third shift, called tertiary spatialization, is the process of diseases being divided, isolated, classified, distributed to hospitals. In this phase Foucault describes a whole set of medical practices and institutionalization processes, how hospitals become closed, privileged regions within a society, where people with medical problems were institutionalized thereby physically dividing the population into healthy and diseased cohorts. In this sense, Foucault's work can be read as successful investigations of material-discursive productions of diseases in different sites of the medical profession with exposing a prominent shift in the way how medical objects have been produced (for more see Philo 2000, 2012). During the twentieth century molecular biotechnology has brought about another transformation in medical thought.

Molecular biology started to take shape as an independent research field in the 1930s and its stabilization lasted until the 1980s. This was the time when technological advancements made it possible to combine methods from the fields of physics, chemistry and biology (Zallen 1992; Rheinberger 2009). Doris T. Zallen in her article, shows the historical period when works towards the molecularization of biology started, and Lily E. Kay explores, how it became an established discipline within the biological sciences only later, in the 1950s and 60s (Kay 1993). The central strand of molecular biological research was concerned with genetics and the application of that knowledge in medicine and contributed to the establishment of the field of medical genetics. Biotechnological advances that took place in and after the 1930s transformed the previously existing medical vision about life, health, and disease.

Another but equally important side of transforming medical thinking, that is emphasized by Michel Foucault, is related to social changes which are not always in immediate connection with medical practice. Nikolas Rose who is a sociologist of biotechnology, places emphasis in his interpretation of Foucault's essay, on the simultaneous entangled social processes concerning the circumstances, which allowed the emergence of the anatomo-clinical gaze, that still occupies a central place in the medical thinking about the human body. These processes "include changes in the laws and practices of assistance, shifts in the organization of medical profession and medical pedagogy, new forms of record-keeping in hospitals allowing the production of new types of statistics of morbidity and mortality,

pathological anatomy of those, who died in hospitals and so forth" (Rose 2007, 10). Beyond mapping the ways how diseases were grasped by medical practitioners, Foucault traced back the roots of modern medical governmentality – the politics of medicine – to the transformations that occurred at the turn of the nineteenth century.

The problem that the literature emphasizes in critiquing Foucault's concept of biopolitics is that it focuses on bodies and populations. In contrast to the Foucauldian notion, contemporary biopolitics became molecular, in the sense that through technological developments the focus of governance is placed into the sphere of molecular biology. With the available biomedical technology the body is no longer seen as a whole entity. Thomas Lemke (2011, 94) brings two examples to strengthen this position: Michael Dillon and Julian Reid (2001) place emphasis on the immense possibilities of the recombination of the biological as a result of molecularization and digitalization of the biological material. This 'recombinant biopolitics' extends beyond the molar level. Michael J. Fowler and Deborah Heath (1993) claim that the most important distinction between contemporary biopolitics and the Foucaldian notion is that the individual is located in the gene pool. In this molecular biopolitical perspective the body is theorized as the sum of its molecular parts, and importantly in this biotechnological frame, instead of placing the individual body into a population, molecularized biopolitics locates the individual in the governmentally relevant gene pool: its molecular elements are relevant for technomedical reasons to elevate the health standards of the population.

The theoretical position that contemporary biopolitics manages the population by focusing on the molecular level phenomena is a significant analytical perspective that helps establishing a critical position towards the molecularization of social categories. Molecular level health management prioritizes on individual health problems and thus personalized genetic medicine would provide medical solutions to individual issues. This position is compatible with the theory that genetic variations (genetic markers) are shared across social groups, that is not only within one social group, but at the same time this position is critical of using genetic traits in a manner that would genetically homogenize the members of a community.

Transformation of eugenic thought: purification v. optimization

One of the more important fields of investigation that concerns biomedical thought pertains to its eugenic heritage. Eugenics is a term that was created by the English anthropologist Francis Galton (1883) in the second half of the nineteenth century;

the discourse of eugenics rests on the Darwinian theory of evolution. Eugenicists wanted to oppose natural selection, and wanted to control the reproduction of the 'degenerate' members of the population. In the case of eugenics, the control meant primarily negative medical and political interventions such as sterilizations and segregation. According to this ideology the goal was to improve the quality of the population by not letting the unworthy reproduce. Advocates of eugenics wanted to introduce state control over the improvement of the population and their aim was to control reproduction without the consent of the individuals.

The critical analysis of the eugenic movements in the United States and in Western-Europe started to take place much earlier than the analyses of these movements within the Eastern part of Europe. For example, Daniel J. Kevles, who is an American historian, provided rich analyses on the history of eugenics and gave insights into the eugenic policies of the United States that lasted well beyond the Second World War (Kevles 1986; 1992; 1999; 1980). Critical studies on Nazi Germany (Weindling 1989b; 1989a; Weikart 2004; Weiss 1987; 2010) shed light on the process of how racial science became a biopolitical driving force that resulted in a rationalization of biological racism supported and controlled by Nazi human geneticists. Daniel Kevles (cited by Asch & Geller 1996, 321) notes that research in genetics before the 1950s "was often motivated by the desire to find negative information about already-stigmatized ethnic, racial, and class groups." In other words, as Maria Bucur (2002) argues in relation to the Romanian interwar context, genetics offered a way to justify and institutionalize eugenic prejudices against particular minorities. Thus, eugenics was an important driving force in shaping the public health goals of the first half of the twentieth century.

It is debated in the literature whether eugenics is still a relevant discourse shaping medical decision making since the 1950s. Scholars, Nikolas Rose for example, argues that the contemporary medical practice is radically different from the eugenic discourses of the past. He claims that 'optimization' is the key concern in this medical paradigm (Rose 2007, 18–20). He suggests that the contemporary focus on susceptibility is an extension of two modes of thought: (1) predisposition and (2) risk. Both have a long history dating back to the eighteenth and nineteenth centuries. Predisposition was understood as an inherited flaw that would manifest itself in illness or pathology. In the nineteenth century all predispositions (social pathology and danger) were understood as degeneracy. It encompassed problems like: urban existence affecting the life quality of the working class and other city dwellers, for others it was about how migrants contribute negatively to the nation's health standards, or how pathologies (such as tuberculosis, venereal diseases, mental illnesses) affect the quality of the offspring. Others said that the issue is rather about how these 'degenerates' are kept alive by the welfare state, so that

they can pass down to their offspring their deteriorated genetic structure, thus contributing to a downward spiral of general health standards. The concerns of the biotechnological discourse over susceptibility are thus connected to these older beliefs. But according to Rose there is an important transformation in this new perspective in contrast to the earlier concerns. This accompanied by the results of epidemiological studies that explore various sectors of the population (divided by age, gender, race, class, weight, diet, family history etc.) suggest risk scales to assess an individual's susceptibility to develop a certain disease. This means, that the present discourse looks at individuals as pre-symptomatically ill. And the direction of biotechnological work is in that of the optimization of the life chances of the individual. This makes it radically different from eugenic discourses. Other social critics such as Allen Buchanan (Buchanan et al. 2000; Buchanan 2011), Dan W. Brock (1994), or John Harris (1998, 2007) similarly to Rose, see much more the positive contribution of genetic research to our societies and they think it should not be conflated with the eugenics of the past.

In contrast to this position, there are critical works that suggest eugenic policies were transformed without sufficient reflexivity, and they are integrated into contemporary biotechnological research and medical thinking. Jürgen Habermas (2003) provides a very complex ethical frame concerning the questions related to genetic enhancement and liberal eugenics. He claims that genetic research and its applications are justified through biopolitical goals. Such goals are the improved health of the individual or prolonged lifespan and these goals tend to change radically since the aim of genetic engineering is not the clinical treatment of health problems but the genetic construction of the healthy individual. The central claim of Habermas is that the biotechnological intervention decided by a third party, necessarily takes away the autonomy of the self. To set out his argument, he draws a parallel between our *lifeworld* and the Aristotelian meaning of the concept. He claims that we are still living in the same Aristotelian world. In its basic constitution it is the same and we still think about our life similarly. In our everyday practices, we intuitively distinguish between the organic and inorganic forms of nature. Aristotle makes a division between the technical and ethical attitudes of the individual. The technical attitude means that the person while producing different kinds of products intervenes into nature. On the other hand, the actor, who engages in a communicative action, performs in order to reach a mutual understanding with the other person in a given social context. The basic point that Habermas makes is that these performative communicative practices show respect to the dynamics that humans find in the natural world. Radical modification of the human genetic makeup blurs the line between the natural and the social in a way that in consequence of the biotechnological intervention, the

intuitively distinguished line between the organic and inorganic or between *the grown* and *the made* will vanish (Habermas 2003, 44–47). Genetic engineering is in contrast with the value of the autonomously conducted life. In contrast to socialization, designer children are determined by their parents and by a third person, who intervenes into their genetic structure. For Habermas this act would blur the line between the natural and the cultural sphere and would take away the autonomy of the self.

Contributing to this critical discourse, Michael J. Sandel (2007) similarly argues that not only negative eugenics are eugenics, not only the attempts to create a better race is eugenics, but the contemporary marketized genetics can be equated with eugenics because of its market strategy to sell designer babies according to the demands of the customers. Intervention into the genetic structure of humans and creating babies, which are desired by the customers, is just as eugenically motivated as the racial betterment of the population through the tools of eugenic policies. Sandel gives contemporary examples to justify his claim: it is common to reject the charges of eugenics by claiming that a medical intervention is the choice of the client. When the rhetoric is based on the free will argument it implies that it is not possible to talk about eugenics since coercion does not apply in such a democratic context. Sandel gives a clear example to counter this claim: the Indonesian government pays for voluntary sterilization for those women whose education and income is low, and supposed to give birth to biologically inferior children. This example clearly shows the eugenically motivated biopolitical policy, based on class, and an ill-formulated argument that tries to justify voluntary sterilization in cases where women are vulnerable because of their social position. But according to him, it is also important to call attention to eugenic practices in other cases as well, when people want to have a designer baby that meets the norms of their social group, or even exceeds them. This is similarly eugenically motivated because in these cases babies are deliberately designed and produced according to the values of the community.

In addition to these examples, the actual, already existing and used techniques are also important for critical scholars. Troy Duster (2003) suggests that genetic screening as a method is akin to the dramatic technique of placing a gun on the wall, as Chekhov points it out: if one places it on the wall in the first scene, it means that it must be used by the third scene. In other words, the mapping of our genetic structure and connecting this to genetic counseling is like creating a tool for a certain purpose and the tool itself implies that it will be used against certain populations. Duster agrees with the liberal argument that when we can use the knowledge provided by our genetic counselors (like how to change our habits, eating, sport etc.) it can be very valuable. If this knowledge creates more possibility and the individual is capable of

utilizing these opportunities that is good in itself. However, he pays attention in his analysis to variables such as class position, environmental issues, and racial identity as well. He suggests that an important task for social scientists is to identify how certain diseases become racial, how risk groups change according to the social factors that are constitutive of medical targets. It is imperative to explore and make it explicit how genetic issues are framed as class, race, or gender problems. Not only genetic screens are significant in this discourse for Duster, but the hidden arguments within health policies and medical encounters. Since he claims that there is a conflict of interest regarding the use of the knowledge provided, geneticists for example must justify their work towards the state economically and medically as well. Consequently, it puts pressure on them to provide results for the state. One of the most obvious ways they can show results is by claiming that they have managed to screen and prevent the birth of those with serious health defects. The question is how the individual is manipulated in a decision making situation and whether they (the couple or the woman) would have the right to have their child with that health condition. Duster gives examples from the context of the United States. It was proposed by the Chicago Bar Association in the state of Illinois to change marriage laws: every couple who would like to get married must obtain a certificate that informs them about their genetic condition (Duster 2003, 127, cited from Kevles 1985). This is a clear example of hidden eugenic arguments at work. The rationale of the suggestion is that couples who know about their shared genetic problem and it is likely that they would pass it down to their offspring must choose a reproductive option that ensures the birth of a healthy child. Duster argues it is economically and medically justified that these different institutions (genetic research, genetic counseling etc.) support the public interest. Thus, he says "the elimination or prevention of the 'defective fetus' is the most likely consequence and ultimate meaning of a genetic screen" (Duster 2003, 130). In his view, liberal democratic states will not embrace eugenics directly, but inevitable he says that the real question is how target groups of genetic screens are identified, what the constitutive social factors are that play a role in circumscribing the targets. And thus, what is an acceptable public policy in cases when the condition is not life threatening, and how to ensure diverse understanding of what it means to be well-born.

Conclusion

Research results stemming from the field of science and technology studies show us that social values are integrated into scientific work and into the produced scientific knowledge. Therefore, the values present in scientific knowledge drive their application

in everyday life. A historically sensitive biopolitical critique is useful regarding the transformation of medical thought because with the help of this critical framework, it is possible to trace the way social values, technologies, biological research, and medical practices intertwine through seemingly distant historical and political contexts. Although, the molecular shift in medicine has opened up the possibility to individually tailor medical treatments and optimize our health as its proponents claim, critics warn, if we are not sufficiently reflexive to historical processes, eugenic thinking can become naturalized even in democratic states, and eventually will harm our understanding of health, and health related practices.

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