

Science neutrality and technological determinism - a debate on technoscience

Renato Dagnino

DOI: 10.3395/reciis.v3i2.261en

Máira Baumgarten

Institute of Humanities and Information, Federal University of Rio Grande, Porto Alegre, Brazil
mayrab@terra.com.br

The book *Science neutrality and technological determinism – a debate on technoscience* by Renato Dagnino is, admittedly, a work touched by emotion. The choice of theme comes from the author's life, his trajectory since childhood. Its context is common to all of us, marking us as scientists and thinkers – the paradigm of modern science, with its promises of progress and great advances from science and technology.

The theoretical-political roots of the reflections made by Dagnino lie in engineering (which he studied), in Cepaline developmentalism, in the Latin American debate about imperialism, modernization, dependency, and the idea of using science and technology to promote social equality.

Latin American thinking about science, technology and society left a mark on his studies and his objective of formulating a descriptive and normative model as an alternative to Innovation Theory (hegemonic in countries of the capitalist center).

The author indicates the book's eminently didactic purpose, stating that it reflects his experience as an analyst of Brazilian and Latin American science and technology (S&T) and also as a participant in its elaboration.

A recurring question that he has tried to answer since his first incursions in the area, the question of why Latin American S&T policy distances itself from social demands, is an important and fairly central point in the debate carried out in this book.

Dagnino reviews an extensive bibliography (international and Latin American) in the field of Science and Technology Social Studies (STSS) and classifies the



Editora Unicamp, Campinas; 2008

ISBN: 9788526807891

way that these studies approach the science-technology-society relation into two great categories: "... *the first has as its primary analytical focus, or as the determining element of the relation's dynamic, its first pole, S&T, while the second has society*" (DAGNINO, 2008, p.15), in their turn subdivided into four variants.

The first approach is based on the supposition that S&T advances continuously and inexorably on its own path – endogenously determined – and may or may not influence society. The two variants there are: *i.* the idea that S&T does not influence society (S&T neutrality) and *ii.* the idea that S&T determines economic and social development (technological determinism).

In the second approach the character of S&T (and not just its use) is socially determined, with S&T tending to reproduce the prevailing social relations. In the focus on society category the variants are: the perspective that S&T characteristics are socially determined (weak non-neutrality thesis) and the notion that, due to its functionality, S&T inhibits social change (strong non-neutrality thesis) (p.16).

Apart from creating this taxonomy as a way of deepening the debate on the theme, Dagnino sets out to sketch a view of the contributions made by a large number of authors (based on his own formulations) so as to allow the reader to form his own opinion about the problematic (2008, p.17). The book's more general formulation is, according to the author "... to assess the implication of adopting each approach and variant for the elaboration of S&T policy, taking as a reference the construction of a socially and environmentally sustainable setting for Latin American development." (p.34).

Based on Feenberg (1995), Dupré (1993), and Oliveira (2002), the author takes up again the question of whether science can promote social well-being and if can be assessed not only according to the cognitive value of its theoretical products, but also according to its contribution to social justice and human well-being. Thus, he defines one of the central objects of the discussion taken up in this book: criteria that can be used as a basis for a theory of democratic technological change that will help explain why decisions about technological alternatives depend on the possible adjustment between them and the interests and beliefs of social groups that influence the conception process (DAGNINO, 2008, p.19).

The debate revolves around the questions: "*do the effects of technology compensate for its benefits? ...Should human being submit to the logic of machinery, or can technology be redesigned to better serve its creators?*" (DAGNINO, 2008, p.17). The question at stake is not technology or progress in themselves, but rather the variety of possible technologies and paths of progress that can be chosen. The intention is to go beyond the polarized debate between uncritical acceptance of the arguments in favor of technical progress or their unconditional rejection.

The book's central concern, therefore, is the role that science and technology can play in social change, aiming specifically to broaden a debate that can bring benefits by reorienting the S&T policy of a peripheral

nation and giving leverage to an alternative style of development.

According to the author, one methodological characteristic of the work is the intention of "...*following the very historical order in which the debate on the theme develops, showing the contradictions and inconsistencies that this reveals and the inadequacy of many ideas and positions proposed to explain observed reality*" (DAGNINO, 2008, p.24-25).

Highlighting the process of reciprocal fertilization between science and technology that is becoming more marked in the current century, forming a binomial (S&T), Dagnino considers S&T as determinants of the social context and capable of inhibiting its change, emphasizing the movement of technoscience consolidation as something characteristic and inherent to contemporary capitalism and involving a growing tendency to assess public research according to its capacity for generating technological solutions that can be appropriated by the market.

The book's structure reflects its intentions. Apart from a broad introduction that clarifies the work's objective, there are two chapters dedicated to debating the elements of the proposed taxonomy – the two approaches of the theme and its variants – and a chapter of final considerations presenting "commitment solutions" synthesized from the work of two authors – Feenberg and Lacey.

According to Dagnino, Feenberg, in the technological reprojecting field and Lacey, in the field of research agenda definition, are authors who show how to establish bridges between the world of ideas and the radical diagnoses that reveal the roots of situations to be tackled and the field of possible political actions that can realistically be used to tackle them (2008). Finally, based on the bridges suggested and his earlier analysis, Dagnino indicates the possibility of another commitment solution, directed at the reality of Brazil and other Latin American countries.

In the chapter that deals with the first approach (focus on S&T) and its variants – science and technology neutrality and technological determinism, the author seeks to demonstrate, by assessing different analysts of the theme, how ideologically and theoretically distinct interpretations of S&T coexist in the neutrality-determinism spectrum and that, in a way, the determinism variant can be seen as a radicalization of the neutrality variant.

With respect to the determinism approach, Dagnino assumes, in a way, a current critique that has its origin in Marx, based on a causal relationship between productive forces and production relations. However, it is worth highlighting the importance of this author's thought to the critique of positivism and the idea of science neutrality (which the book's theoretical review itself indicates).

Dagnino's central objective is to critique technology related to the existing means of social production and, during the construction of this debate, the idea is sometimes obscured that science contains in itself

(as it is not monolithic) critical potentials relative to society and to scientific doing itself and that the social sciences have an important role to play in the process of questioning the paradigm of modern science and of technology critique.

In this sense, it seems to me that the debate about science neutrality/technological determinism could benefit from the inclusion of the idea of the double conditioning between society and science¹ that originates from the idea of adaptation (not determination) between productive forces and production relations and a reading of Marx that is less committed to the interests of maintaining capitalist social structures and/or a specific historical moment when this perspective was used from the point of view of determinism².

It is worth noting that the author, although he criticizes the idea of science neutrality and positivism, takes up some of the concepts of this theoretical field, such as the concept of “research community”, which can be associated to that of “scientific community”. The theoretical origins of this concept lie in the positivism field, in the idea of autonomy and neutrality of science and in the perspective that idealizes scientists, excludes other actors in the field and leaves no space for the analysis of the correlation of forces in the different interests present in society³.

The importance of what he calls the Brazilian “research community” in defining the area’s policies, its lack of reflexivity, are elements highlighted by Dagnino, who does not, however, establish bridges more organically between the theoretical-political debate he proposes, the reality in the S&T field in Brazil and the Brazilian scientific collective.

The chapter of the book dealing with the “*focus on society*” perspective is very rich in theoretical terms, undertaking a “guided tour” of the various currents and approaches of science social studies and technology studies. However, when he assesses the current situation: “*In contemporary times, capital systematically organizes science and scientific education, private and public P&D laboratories, through the allocation of part of the social surplus...*” (DAGNINO, 2008, p.146), the space and possibility for counter-hegemonic perspectives becomes opaque, painting S&T and producers of science and technology as monolithic and linked to socio-economic production/reproduction.

When he presents the final considerations, the author begins by stating that: “... *the adoption of one or more of the approaches presented as an explicatory model of reality does not imply that the proposed political action has to be strictly associated to it.*” (p. 205) and that the proposed political lines of action advocate

“...a transformation strategy starting from the bottom – which has been adopted by, among others, popular Latin-American movements, and which emphasizes the existing dialectic between the means and the ends and between personal and social changes, promoting the values of solidarity instead of individualism; of social goods instead of private property and profit; of sustainability instead of control and subordination of

nature; of people’s well-being instead of the market and property.” (DAGNINO, 2008, p.206).

Based on the perspectives of Feenberg (1991; 2002) and Lacey (1999), the author suggests using a new set of values for the “reprojecting of technology and its democratization. The proposal is: “*to identify (in social movements) the questions linked to more specifically technological aspects and translate them into demands for change in the conception of the technologies involved is an important line of action.*” (DAGNINO, 2008, p.219). Analyzing the question of technological controversies, the author points to the possibility of the appearance of “...a new ‘public sphere’, which supposes a new type of relationship between the technical scope and social life and a new style of rationalization that internalizes sociotechnical parameters and costs that had not yet been considered in the technical-economic calculation.” (DAGNINO, 2008, p.219).

By imagining another “commitment solution” the author focuses on the two principal moments of the Brazilian S&T elaboration process: the discussion with members of the “research community”, in the sense of critical analysis of the research agenda they explore, and the conception of technological alternatives suitable for ventures coherent with that alternative development style.

The first moment of the debate presents two sets of methodological propositions based on contributions from Feenberg aimed at confronting the moment of discussion with the members of the “research community”. The third moment presents a set conceived for the observation of processes (in course) for developing technological alternatives and for classifying sociotechnical adaptation modalities (STA).

This concern with STA, according to the author, is situated in the context of the reemergence of themes related to alternative technologies, taking place within movements such as the Networks for Economic Solidarity, the Technological Incubators of Popular Cooperatives, the Recovered Factories and the Popular Cooperatives (DAGNINO, 2008, p.255).

According to the author, STA can be described as being similar to the process of technology adaptation originating in the countries central to our technical-economic conditions. This process seeks to promote adaptation of scientific and technological knowledge to the set of socioeconomic and environmental aspects that make up the science, technology and society relation (DAGNINO, 2008, p.257).

The STA proposal, according to Dagnino, is very similar to the “democratic rationalization” defended by Feenberg – a process that, conducted by “democratic communities”, would liberate the choice of technological project from hegemonic coercion.

According to Dagnino, the STA concept concentrates on the process-path that a sociotechnical configuration traces during a trajectory that doesn’t have a defined end point, incorporating the idea that what actually exists is an interactive process of innovation, where the author

who is directly involved with this innovative function simultaneously knows the “supply” and the “demand” of technology. The conclusion is that technological innovation cannot be considered something which is made in one place and used in another, but rather as a process that is developed in the place where this technology will be used and by the actors who will use it (DAGNINO, 2008, p.267-268). This conclusion is accompanied by the idea that it is necessary to work with a scientific and technological policy agenda that is more complex and, we may add, more reflexive.

The book *Science neutrality and technological determinism – a debate on technoscience* is, without doubt, a weighty work and should be read by anyone who wishes to know the field of science and technology social studies and/or deepen the debate about the relations between science, technology and society and, especially, reflect on the possible paths for S&T in the (semi) periphery of the capitalist world.

Notes

1. In this respect see Baumgarten, M. **Conhecimento e sustentabilidade. Políticas de ciência e tecnologia no Brasil contemporâneo**. Porto Alegre: Ed. UFRGS; Ed. Sulina, 2008. In this respect see Baumgarten, M.

2. In this respect see Baumgarten, M. **Conhecimento e sustentabilidade. Políticas de ciência e tecnologia no Brasil contemporâneo**. Porto Alegre: Ed. UFRGS; Ed. Sulina, 2008.

3. With respect to the debate about the notion of “scientific community” or, specifically, the term “community” applied to the set of scientists (and other actors) in Brazil’s current historical moment, see Baumgarten, 2004 and 2008.

Bibliographic references

BAUMGARTEN, M. Comunidades ou coletividades? o fazer científico na era da informação. **Revista Política & Sociedade**, Florianópolis, v.1 n.4, p.97-136, 2004.

BAUMGARTEN, M. Tecnologia. In: CATTANI, A.D.; HOLZMANN, L. (Org.). **Dicionário de trabalho e tecnologia**. Porto Alegre: Ed. UFRGS, 2006.

BAUMGARTEN, M. **Conhecimento e sustentabilidade: políticas de ciência e tecnologia no Brasil contemporâneo**. Porto Alegre: Ed. UFRGS; Ed. Sulina, 2008.

BENSAÏD, D. **Marx, o intempestivo: grandezas e misérias de uma aventura crítica**. Rio de Janeiro: Civilização Brasileira, 1999.

DUPRÉ, J. **The disorder of things: metaphysical foundations of the disunity of science**. Cambridge, MA: Harvard University Press, 1993.

FEENBERG, A. **Alternative modernity**. California: University of California Press, 1995. 