Editorial

This Special Issue marks **Scientiæ zudia**'s tenth year. It consists, for the most part, of articles that resulted from the XX International Seminar of Philosophy and History of Science, "Technoscience, culture and society", held during the week, 23–27 August 2010, in the Department of Philosophy of the University of São Paulo. This Seminar was one of the international activities of the Thematic Project (TP), Fapesp 07/53867-0, "Origins and significance of technoscience", and it involved collaboration with three principal investigators (Bensaude-Vincent, Nordmann, Schwarz) of the project GOTO ("Genesis and ontology of technoscientific research objects''), funded by the French and German Research Councils, ANR and DFG. Exceptionally, this issue of **Scientiæ zudia** is published in English. The articles (and the seminar presentations on which most of them are based) were prepared in English by seven international contributors, so that it was not feasible to publish them otherwise. Moreover, since together they serve as a kind of état de lieu of the reflection about technoscience that has been carried out in connection with the TP and regularly published in **Scientiæ zudia**, the Special Issue provides an opportunity to bring the work of the TP to a wider audience.

Different perspectives on technoscience, and consequently different evaluations of its place in society and culture, are expressed in the articles published in this issue. They range from strongly holding that technoscience is an accomplished fact (or on the way to being so), an inevitability or necessity of our times, passing through intermediate positions that consider technoscience as leading to consequences and risks that should be discussed, taking alternatives into account, in the context of democratic decision-making, to the position that strictly speaking there is no such thing as technoscience but only what is in large measure an "invention" of the proponents of particular scientific and technological policies. The three reviews are critical studies prepared by scholars from the University of São Paulo who attended the Seminar and who, building on the diverse materials encountered there, contribute to the discussion about how to characterize technoscience and its relationship with social and democratic values.

The first article is by Alfred Nordmann. He argues that "technoscientific knowledge claims" broadly refer to "some new measure of control [that] has been achieved in a laboratory", as opposed to "scientific knowledge claims", which traditionally result from testing hypotheses for their evidential support. For him, the function of epistemology is neither (at the level of discourse) to reconstruct a theory or the evidence that supports a hypothesis, nor (at the practical level) to describe capacities or skills, but to give an account of "the acquisition and demonstration of a public knowledge of control". Nordmann proposes five epistemological features that characterize technoscience; and he endorses the idea that there is a type of activity, which leads to knowledge of control, that is distinctly technoscientific.

In the second article, Anne Marcovich and Terry Shinn propose a transversalist theory of the production and diffusion of science and technology that is linked with the critical sociology of science of Pierre Bourdieu. They propose a pluralist image of science and technology, which is based in the way these practices incorporate multiple historically

established regimes of production and diffusion, each of which possesses its own divisions of work, its specific and limited modes of production of knowledge and artifacts, and its specific audiences. The authors maintain that the perception of a pluralist and multifaceted science depends on the principle of differentiation that permits certain types of organization of the "borderlands", not only those that "distinguish between science and other forms of social activity", but also those that "distinguish between the local expressions that belong to science". The concept of "borderland" is connected with others, such as "collaboration" and "synergy", that are part of a sociological dynamic between differentiation and interaction. It follows that, for these authors, technoscience does not exist as a distinct research activity in which boundaries between disciplines are not respected; on the contrary, what we have are regimes of scientific and technological production that are highly differentiated and specialized.

In her article on the experimental mode of cognitive operations, Astrid Schwarz looks back to Francis Bacon and finds, in his use of aphorisms and fragments, the ancestry of contemporary experimental technoscientific practice, in which are generated technoscientific objects and their supporting evidence. She discusses Bacon's experimental philosophy, organizing it interpretatively around "the idea that learning how to learn is necessary in order to know". Then, she attempts to show that, in Bacon, the selection of form – whether it be the form of exposition, or of the very data that are typical of Bacon's inductive method – is decisive for the construction of a heuristic instrument that points towards an ontology, founded in notions such as co-action, co-working, co-habitation and affordance, which are essential aspects of a conception of technoscientific objects.

The following two articles, by Bernadette Bensaude-Vincent e Janine Guespin-Michel, have a clear thematic affinity insofar as they are located at the level of politics and, therefore, of values. They deal, respectively, with issues about public engagement in science and about the relation between science and democracy. Bensaude-Vincent reflects on the case of research in nanotechnology. She discusses two models of scientific communication, the traditional "diffusionist" and the contemporary "participatory" models, in order to show that, although the latter has been adopted for policy making about nanotechnology, "public engagement in nanotechnology research" enables the proponents of nanotechnology "to attract public interest and private investors", but not to enable lay citizens to participate in making decisions. Guespin-Michel starts out from the transformations that affect research and science in the so-called "knowledge economy". She points out that these transformations extend not only to decisions made about science policy and the management of research, but also to determining that scientific activities are aimed first and foremost at innovation; they mark the transition from science to technoscience. This transition – like the science practiced in the 20th century that gave rise to technoscience – contributes to capitalist competitiveness and to the current economic crisis, and so it is not a suitable base for the democratic construction of a "different form of globalization". We must, then, redesign the scientific ethos, if we want a democratic society that it more just and equal.

Finally, Hugh Lacey's article puts all the above positions into perspective. He begins with the proposal that technoscience is a type of scientific activity that is characterized by conducting research under decontextualized strategies (principally in the laboratory), and using advanced technology for the production of instruments, experimental objects, new materials and structures. Then, technoscience can be taken to be the part of the science that aims to obtain knowledge of new domains, especially knowledge of new possibilities for development of products and processes in practical domains, such as those connected with chemical and pharmaceutical industries. This is knowledge that leads to innovations to serve the values of the market, e.g., economic growth and gaining competitive advantage. The author then questions the legitimacy of considering technoscientific objects purely in scientific terms, since they embody the values of technological progress and of capital and the market. Certainly technoscience is not the whole of science.

This Special Issue of **Scientiæ zudia** concludes with three lengthy book reviews. Maria Caramez Carlotto critically discusses Bernadette Bensaude-Vincent's arguments related to the "demystifying character" of the concept of technoscience, to the supposed profound transformation in the epistemological project of modern science, and to the primacy of technoscience to social theory. In this way, she evaluates the contribution that the author's reflections on historical, epistemological and social significance of the so-called technoscience make to the on-going debate about the relation between science and technology. Kelly Ichitani Koide shows how Nicolas Lechopier, dealing with epidemiology, defends a kind of methodological pluralism in the life sciences. In doing so, she explains, Lechopier argues for the reformulation of the (mertonian) scientific ethos, for rejecting the separation between epistemic and ethical values, and for turning the distinction between science and non-science into a local one; moreover, he maintains that the methodological pluralism involves "periepistemic values" that underlie divergences among experts and his proposal of a "militant epistemology". Finally, reviewing Javier Echeverría's book, which has been very influential in Spanish speaking countries, Pablo Rubén Mariconda argues that the author overstates the revolutionary character of technoscience, seen by Echeverría as an inevitable praxiological transformation that alters radically the values that rule in science. Various conceptual confusions present in the book are exposed in order to show that Echeverría is simply presenting a discourse legitimating the importance of evaluation for the management of technoscience.

Hugh Lacey
Pablo Rubén Mariconda
the editors