

### **THE ORIGINS AND SIGNIFICANCE OF TECHNOSCIENCE: ON THE RELATIONSHIPS AMONG SCIENCE, TECHNOLOGY AND SOCIETY**

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*Photo from Thematic FAPESP Seminar – Hugh Lacey and Pablo Mariconda (photo by Leticia Freire)*

The central objective of this project, to be conducted during 2008–2012, is to critically investigate the roles of by ethical and social values, whether held by individuals or embodied in institutions, on current scientific and technological practices. This research will encompass two sets of investigations. The first investigation concerns the contemporary significance of technoscience, including the impact of its research and development on the processes and institutionalization of scientific research. The second investigation considers central aspects of the historical development of technoscience.

The issues investigated in the first study will include the following: (a) the changes that have occurred in recent decades in the social production of technoscientific

knowledge with the shift toward greater private (and less public) financing of research; (b) the effect of these changes on the status of the values of objectivity, neutrality and autonomy to which the scientific community has traditionally adhered; (c) the function of intellectual property rights in this process; (d) some problems of contemporary technoscience, including theoretical problems (e.g., the distinction between artificial and natural biological identity) and practical problems (e.g., ethical criticisms, alternative proposals); and (e) the relevance of alternatives to technoscientific practices (e.g., agroecology) as well as the role of bioethics and approaches influenced by the 'precautionary principle' to the appraisal of the significance of these changes.

The second set of investigations will include the following: (a) the concept of 'the control of nature' and the impact of technological progress on modern scientific research and (b) the relationship between science and technology in modernity, especially the role played by machines and mechanistic ideas. Both investigations will be strengthened by the use of a model of scientific activity that has been widely discussed and endorsed among the members of the research team. This model identifies the mutually reinforcing relations that exist between the adoption of particular methodological approaches in research and specific ethical and social values.

The second (and equally important) objective of the project is practical: to plan a series of events and publications that bring together Brazilian (and other) scientists, philosophers and social scientists of divergent methodological approaches and ethical outlooks for constructive and rational discussion. These discussions will ensure that a wide range of viewpoints are considered in the investigations and will explore how the results obtained may positively impact scientific research, the teaching of science, and higher education.

## SUMMARY OF RESULTS TO DATE AND PERSPECTIVES

First, an innovative reflection and perspective has been developed in the Thematic Project (TP) for the social studies of technoscience by examining the interaction among the philosophical, historical and sociological dimensions of science and of technology. Regularly scheduled 'International Seminars' have contributed to the development of this perspective. Notably, this reflection has led to several important publications, including many on the themes of the Thematic Project, which have been published in the quarterly journal *Scientiae Studia* (see the Main Publications).

Second, the journal *Scientiae Studia* has been consolidated on a sound foundation and has been made available in electronic format on SciELO-Brasil (see [www.scientiaestudia.org.br](http://www.scientiaestudia.org.br) and [www.scielo.br/scielo.php?script=sci\\_serial&pid=1678-3166&lng=pt&nrm=iso](http://www.scielo.br/scielo.php?script=sci_serial&pid=1678-3166&lng=pt&nrm=iso)). It is widely regarded as the leading journal of the history and philosophy of science in South America. The journal receives submissions of manuscripts of increasingly high quality from many parts of the continent as well as throughout Brazil.

Third, a larger group of researchers (with a focus on the relations between science, society and culture) was formed in this period of the TP with personnel from USP and from Unifesp and UFABC. This research group has enabled collaborative research activities among professors of the three universities as well as among visiting researchers, postdoctoral fellows and doctoral students. It has also facilitated the development of planned and effective teaching programs (especially for 'Iniciação Científica' and master's programs) in philosophy, sociology and education (at USP), philosophy (Unifesp) and education, history and philosophy of science and mathematics (UFABC). The latter two programs are newly accredited master's programs.

Fourth, the TP contributes to creating the conditions for rational and constructive discussion between proponents of different methodologies and ethical perspectives, paying special attention to issues of the legitimacy of technoscientific innovations and the priorities of scientific research. As part of this approach, its members have frequently participated in meetings of scientific organizations (e.g., SBPC, 1st Encuentro Internacional Culturas Científicas y Alternativas Tecnológicas, Buenos Aires). In addition, the members have participated in groups that have organized national and international meetings (e.g., World Forum Science and Democracy, 2009; working groups planning events for Rio + 20, 2011). The TP's participation in these events is concerned with (among other things) critical analysis of the ethical, social and political presuppositions and methodologies of scientific research as they affect deliberation about public policy concerning science.

## MAIN PUBLICATIONS

- Lacey H. 2011. Integrative pluralism. *Studies in the History and Philosophy of Science*. **42(1)**: 219-222.
- Lacey H. 2010. The ethics of science and technology. In: Lorenzano P, Rheinberger H-J, Ortiz E, Galles C. (Eds.). *History and philosophy of science and technology*. Oxford: EOLSS Publishers Co. Ltd. **3**: 258-291
- Lacey, H. 2009. The interplay of scientific activity, worldviews and value outlooks. *Science & Education*. **18 (6-7)**: 839-860.
- Lacey, H. Valores e atividade científica 1. 2008. São Paulo: Associação Filosófica Scientiae Studia/Editora 34.
- Lacey, H. Valores e atividade científica 2. 2010. São Paulo: Associação Filosófica Scientiae Studia/Editora 34.
- Lacey H, Mariconda PR. 2011. The eagle and the starlings: Galileo's argument for the autonomy of science – how pertinent is it today?. *Studies in the History and Philosophy of Science*. (in press).
- Mariconda PR. 2008. As mecânicas de Galileu: as máquinas simples e a perspectiva técnica moderna. *Scientiae Studia*. **6, 4**: 565-606.
- Mariconda PR. 2011. Galileo and modern science. In: Krause D, Videira A. (Eds.). *Brazilian Studies in Philosophy and History of Science*. Dordrecht: Springer. p. 57-69. (Boston Studies in the Philosophy of Science, 290).
- Mariconda PR. 2010. The control of nature and the origins of the dichotomy between fact and value. In: Lorenzano P, Rheinberger H-J, Ortiz E, Galles C. (Eds.). *History and Philosophy of Science and Technology*. Oxford: EOLSS Publishers Co. Ltd. **4**: 1-19.
- Mariconda PR. 2011. Tradução, introdução e notas de Galileu Galilei. *Diálogo sobre os dois máximos sistema do mundo ptolomaico e copernicano*. 3ª edição. São Paulo: Associação Filosófica Scientiae Studia/Editora 34.
- Ramos MC. 2009. *A geração dos corpos organizados em Maupertuis*. São Paulo: Associação Filosófica Scientiae Studia/Editora 34.

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