Editorial: Nanotech Challenges, Part II

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Since the publication of Part I of our joint special issue on Nanotech Challenges (see Techné 8.2 & Hyle 10.2), several international conferences have taken place that brought together scholars from the humanities and the social, natural, and engineering sciences to reflect on the challenges posed by nanotechnology. These included *Nanotechnology in Science, Economy and Society*, University of Marburg, 13-15 January 2005; *Nano-Ethics*, University of South Carolina, 2-6 March 2005; *Nano Before There Was Nano*, Chemical Heritage Foundation, Philadelphia, PA, 18-19 March 2005. In addition, numerous research groups worldwide, who used to investigate the science-technology-society interfaces, have put nanotechnology at the top of their agenda; international expert groups are being formed; and national centers will soon be established in the US and UK.

Of course we hope that our joint special issue is not only timely but also influential on the debate and the shaping of a growing international community. Since the nano-hype seems to have infected the humanities and social sciences, it is important to keep scholarly standards high and to provide space for critical and independent views that might not always be welcome in commissioned reports.

While the corresponding Part II in Hyle 11.1, focuses on ethical issues of nanotechnology, the present Techné collection consists of papers that combine theoretical with practical reasoning. The first two contributions each point out that epistemological issues of nanotechnology are related to ethical issues. The third paper transfers concepts of the public negotiation of truth to the public negotiation of what is worth funding in nanotechnology. The forth suggests a philosophical research agenda that integrates theoretical and practical issues of nanotechnology.

With reference to Kant's distinction between phenomena and noumena, Alfred Nordmann argues that some areas of nanotechnology are *noumenal* technologies in the sense that their products resist our capacities of experience, imagination, and causal representation. Contrary to the ambition of mastering nature, products of *noumenal* technologies appear similar to brute nature by provoking a mixture of awe and abhorrence. He concludes that, because the gap between our manu-

facturing and representational capacities raises ethical concerns, all the educational efforts to make the nanoscale imaginable bear an ethical dimension.

In his epistemological analysis of scanning electron microscopy (SEM), Joseph Pitt argues that SEM plots, although they convey exact information, should not be called images because they are not exact representations of reality. The talk of images invokes the metaphor of plain seeing, which is misleading in many ways. Not only does it suggests naive epistemological realism and an incorrect view of our knowledge of the nanoscale, it also misinforms ethical considerations that are based on the view of our knowledge.

In his case study on a Danish research group that moved from surface science to nanotechnology, Arne Hessenbruch analyses the interfaces between science and the public. Unlike former science studies that have focused on epistemological issues, his focus is on emotions, like pleasure and exhilaration, which are conveyed by newspaper articles, high gloss magazines, movies, and even research papers for the intrascientific public. He argues these emotions play an important role in the struggle for funding and are a driving factor for the current nano hype.

Drawing on the work of the Dutch philosopher Herman Dooyeweerd, Marc de Vries develops a comprehensive philosophical research agenda for nanotechnology. Rather than taking nanotechnology as a complex whole, he distinguishes between fifteen aspects, including physical, biotic, psychological, social, economic, ethical, and religious aspects. For each of these aspects he discusses particular issues and how they could be related to each other on a more general level.

Finally, we hope that our experiment of jointly editing a special issue will become a model in the future whenever a topic concerns readers of more than one journal. Again, readers of Techné are encouraged to read the corresponding Part II of Nanotech Challenges in Hyle 11.1, and vice versa.