

Editorial

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Almost everything about nanoethics is in dispute, so some scepticism about the emergence of a journal in the area would not be too surprising. There is not even agreement about what nanotechnology is. Is there *nanotechnology* or are there *nanotechnologies*? If there is a nanotechnology, what is it, and if there are nanotechnologies, what is it that they all have in common? And is it new or just a continuation of what scientists have been doing for decades, or longer? According to Sparrow in this volume, the nanotechnology literature gives contradictory messages on this. The problems do not stop even where there is agreement on the nature of nanotechnology. It is most commonly explained in terms of size; nanotechnology is concerned with matter in the 1–100 nm range where new properties emerge. But even where this accepted, there is disagreement about nanoethics. Is there a branch of applied ethics, nanoethics, similar to, for example, bioethics or computer ethics? It can be argued, quite plausibly, that nanotechnology does not raise any new ethical issues; it is just more of the same. Anything that might be considered an issue in nanoethics is an issue in some other branch of applied ethics, so what is the point of nanoethics? Swierstra and Rip argue that while there might not be a nanoethics, there is an ethics of new and emerging technology and that some of the issues are nano-

specific. But some would claim that the situation is worse than that of there being no uniquely nanoethics problems. The issue is rather that many of the so-called “ethical issues in nanotechnology” are in areas where there has as yet been little development, so discussion of them must be based on prediction. Prediction of course is notoriously unreliable, and this is nowhere more true than in predictions about the directions of scientific and technological developments. Nordmann discusses this issue critically, in terms of speculation and the tendency to treat remote possibilities as likely technological developments. Given that there have been few applications of nanotechnology developed yet that are raising concerns (the possible toxicity of some nanoparticles is a notable exception, discussed here by Shrader-Frechette), how does one do nanoethics, a question that receives the attention of Johnson. This too is not clear, and if all that can be done is based on prediction, it is at best a dubious activity. This predicament is a version of the Collingridge dilemma: If the ethics is done before the technology has impacts, it is difficult to predict what those impacts will be, and if done after the technology has been developed it is difficult to control the impacts.

These problems are all legitimate but there is enough consensus regarding what constitutes nanotechnology (or nanotechnologies), for the examination of ethical issues to begin. Certainly it is not clear that the issues will be new in any interesting sense, but many problems will almost certainly be exacerbated and made more urgent. A good example is privacy, given the fact that nanotechnologies will enable more

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sophisticated monitoring and surveillance technology. It is true too that prediction is hazardous, but it could be argued that it is also essential. Nanotechnology is being actively promoted in many countries, because of its predicted benefits both to the economy and to humanity. Careful prediction is different from wild speculation. Nanoethics, it could be argued, should be based on careful prediction and constant reassessment of the science and technology. In 1960 Norbert Wiener, talking about automated machines, wrote: “To be effective in warding off disastrous consequences, our understanding of our man-made machines should in general develop *pari passu* with the performance of the machine” (Wiener, “Some moral and technical consequences of

automation” *Science*, 131,1960, p. 1355). Perhaps this should be the model for nanoethics.

The aim of this journal is to advance the examination of ethical and social issues surrounding nanotechnologies in a philosophically rigorous and scientifically informed manner. Not only are the impacts or likely impacts of these technologies the subject matter for this journal, but so are the uncertainties about nanoethics that were mentioned earlier. Nanotechnologies, because of these uncertainties, encourage examination, or reexamination, of some basic issues in the ethics and philosophy of technology and science. Hopefully this journal will help stimulate these discussions.