NANO-ETHICS

Category:
Basic Ethical Concepts

Nano-ethics [*also:* nanoethics; Nano-Ethics] is an infant hyphen-ethics in the realm of applied ethics (Ethics and Morality). Occasionally, when the focus of investigation is directed towards the development of nanotechnologies in the field of biology or medicine, researchers talk of nano-bio-ethics.

Generally speaking, nano-ethics encompasses the analysis of social and ethical consequences of everything that carries the label 'nanotechnology' – from privacy issues arising from nanotechnologically enhanced surveillance to dreams of human enhancement. Even problems caused by products sailing under a false flag (Magic Nano) belong to that group.

In this article we will introduce some prominent fields of ethical inquiry in this context and discuss more generally the relationship between nanotechnology, its applications, and ethics.

Roughly speaking, the following ethical aspects are covered in literature:

(1) Ethical dimensions of nanotechnological applications in medicine — pharmaceutics and health care. Although it is expected that the ability to diagnose and cure illnesses can be quickly improved through nanomedicine, diagnosis will develop much faster leaving more and more people confronted with devastating diagnoses but without hope, as is already the case with genetic diagnostics. The miniaturization of diagnostic instruments would lead to more and more data concerning the health status of a patient — data you never asked for and didn't want to know, data that could be misused or even lead to genetic discrimination.

(2) Privacy is endangered when nanotechnology opens up new possibilities of surveillance. Miniaturization could not only lead to new tracking transmitters ("Always know where your dog/husband/wife etc. is"), it also removes those devices from the awareness of the people and is part of an invisible (and thus uncontrollable?) environment.

(3) Some publications underline that military and terrorist misuse of nanotechnologies is possible. New sensors, enhanced biological and chemical warfare agents, modified battle dresses and equipment are only a few possibilities. In the long run there could be a new arms race.

(4) Who will benefit from these new technologies, for whom will they be available? Will there be a nano-divide between industrialized nations and the 'third world' — and between different social strata within a society? Questions of distributive justice arise. Patents play an important role here, since patenting basic important technologies could place the key to further developments in the hands of a few people.

(5) Who decides whether and what risks can and should be taken, and who is exposed to possible dangers, who takes responsibility? Another focus is the aspect of participation of members of society, and what that participation should look like.

(6) In the current debate environmental ethical aspects are mainly discussed on the basis of the toxicity and life cycle assessment of nanoparticles with respect to their release into the environment and exposure at the workplace and contact with the end-user. Some people hope for a great positive impact of nanotechnologies in the fields of detoxicating the environment (soil and water), alternative clean energy supply systems, reduction of unwanted side products, and a boost for sustainability as such, in short — green nanotechnology.

(7) Speculations about enhancing the human body lead to anthropological questions — what is the nature of human beings? If mental and physical abilities can be enhanced, if new abilities can be added - how many 'prostheses' can you take and still be ☛

☞ 'human'? These questions maybe are less of an ethical or moral nature but rather aimed at our human understanding of the self. Though such deliberations are mainly based on visions and futurist speculations, they transport views of human nature, e.g. the conception of human beings as sum of mechanical functions.

The above variety of ethical issues illustrates a need for ethical analysis but it also suggests that there isn't really anything new beneath the sun. The question of privacy might have arisen when the first watchtower was built. The issues of data misuse is similar in the gene debate, participation in political processes is being discussed generally, etc.

But if it is true that there are no genuinely new ethical issues with nanotechnology, it is also true that existing ones are intensified. Nanotechnology as enabling and converging technology also enables new applications, promises new ways and a new depth of manipulation and links different sciences.

Some ethicists thus argue, that there is no need for a new label 'nano-ethics' because all issues are covered by existing hyphen-ethics like environmental-, medical- or business-ethics etc. Others favour a common label to better keep track of the diverse developments. Apart from that, labelling here is not only an ethicist's business: political and corporate interests in labelling or un-labelling (thus influencing how a technology is perceived) have to be taken into account.

Q: Could, might, would and should — this is a nice collection of modal verbs. Many technological developments are mere predictions! **A**: The ethical debate should be limited to deal with relatively near and well founded predictions. Otherwise, it would be ⊙speculative nano-ethics: to lend far fetched visions credibility in treating them as if they were upon us already, thus diverting attention from more imminent questions. To refrain from predictions on the other hand would leave ethics in the much criticized position of panting behind accomplished facts.

Q: So nano-ethics deals with nanotechnologies (plural)? **A**: This is certainly true. But not only discussing aspects of distinct applications or societal aspects is ethics business — the act of disentangling the complex phenomenon of nanotechnology is an ethical venture in itself. It is necessary to establish a common learning process that opens up the programs of nanotechnology for political and ethical discussion. It is advisable to identify basic programmatic strands in the field of nanotechnology. Each of these strands opens up perspectives on scientific approaches and technological visions, and it also sheds light on a set of ethical and societal problems.

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Links to other Portfolio sheets:

Ethics and Morality · Green Nanotechnology · Justice/Nano Divide · Magic Nano · Disentangling Nano · Sustainability

⊙ Literature: Print & WWW

Ach, J. and N. Jömann: Nano-Bio-Ethics. Ethical Dimensions of Nanobiotechnology. LIT-Verlag, Berlin 2006.

Allhoff, F., Lin, P., Moor, J. and J. Weckert (Eds.): Nanoethics. The Ethical and Social Implications of Nanotechnology. Wiley, Hoboken, New Jersey 2007.

Nordmann, A.: If-and-Then. A Critique of speculative NanoEthics. In: Nanoethics Vol.1 No. 1, March 2007, pp. 31-46. See also [here].