

Nanotechnology as a solution to the problems of developing countries?

Reply and moral of the story

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A recent article, (1) which has received a great deal of attention from the international scientific press, (2) introduces nanotechnology as the solution to many problems in developing countries. After interviewing 63 experts in nanotechnology from several developed and developing countries, the authors, from the *Joint Center for Bioethics* at the University of Toronto, identified the ten main nanotechnologies that could provide a solution to such problems as water, agriculture, nutrition, health, energy and the environment. The technologies range from energy production and conservation systems, with sensors that will increase agricultural productivity and the treatment of water, to the diagnosis of diseases. In the article, the creation of a Global Fund is proposed for the development of these technologies for all developing countries. Overflowing with good intentions, the proposal reflects the mechanical idea that if a problem can be identified correctly, all that has to be done is apply a suitable technology and it will be solved. Most of the examples used do not take into account that the relationship between science and society is much more complex. Let us look at some examples:

- Salamanca-Buentello *et al.* suggest that quantum dots could detect HIV-AIDS molecules in the early stages, thereby facilitating the treatment of AIDS and reducing the number of new cases. The authors seem to forget the story of the last ten years, which has been one of open war between multinational pharmaceutical corporations and the governments of countries that intended to manufacture antiretrovirals against AIDS. In this conflict, the World Trade Organization and the Commercial representative of the United States have systematically played the role of representatives of these corporations. Nanotechnology products are already being patented, mostly by the most important corporations. A patent in the USA costs thirty thousand dollars in legal bureaucracy, and a

worldwide patent may be as much as a quarter of a million dollars. (3) **Moral of the story:** technology is produced in a given social context, and the efficiency and implications of its application depend on that social context.

- The article identifies nanotechnology as the solution to five of the eight Millennium Goals of the United Nations. Among these solutions are nanosensors and nanocomponents to improve the dosage of water and fertilization of plants. With this technology, it would be possible to reduce poverty and hunger in the world. The authors do not remember that, not so long ago, in the eighties, Genetically Modified Organisms were hailed as the solution that would put an end to hunger and poverty. However, Genetically Modified Organisms ended up being used mainly in developed countries, and three out of four patents are today in the hands of four large multinational companies. There has been no improvement for Third World countries; quite the contrary, transgenics turned up where they were not wanted or expected, as was the case of the contamination of corn in Oaxaca, Mexico; and commercial and technological dependence was incremented. (4) **Moral of the story:** the choice of technology is not a neutral process. It depends on political and economic forces. It is not necessarily true that which is best and meets our needs will be the one to survive.

- The authors suppose that the interviews with 38 scientists from developing countries and 25 from developed countries will allow them to speak of the interests of the developing countries as if they were their spokespeople. In an article prior to the one we are discussing, three of the same authors maintained that the position adopted by Prince Charles, arguing that nanotechnology will widen the gap between rich and poor countries, and the position of the ETC group requesting for a moratorium on public funding for nanotechnology “ignores the voices of the people in developing countries”. (5) Surely, with this research, the authors intended to fill this gap. But the opinion of scientists involved in nanotechnology does not necessarily fall in with the most appropriate pathways for satisfying the needs of the poor. Scientists are pressured by public funds to survive, by the criteria of relevance and themes of scientific periodicals, by generally self-censored publications, etc. We may concur that infectious diseases are one of the main problems that the developing world is facing, but we may differ radically on how a solution to this

problem should be attained. Prevention is not the same thing as a cure. Nanotechnology is not necessary to reduce malaria radically, for example, as is suggested by the authors. There is not a doubt that nanosensors could help to clean the water, and that nanocapsules could make drugs more efficient. Nevertheless, in the Henan Province of China, malaria was reduced by 99% between 1965 and 1990 as a result of social mobilization backed up by fumigation, the use mosquito nets and traditional medicine. (6) Vietnam reduced the number of malaria-related deaths by 97% between 1992 and 1997 with a combination of popular organization, mosquito nets, insecticide and traditional medicine. (7) **Moral of the story**: there are many means to an end, and technology is not always the solution. Organizing people – which some refer to a *social technology* – can be just as important.

References

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