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The same old story

Another panel of experts in the UK has published another report calling from more research into the effects of nanomaterials on health and the environment. Will anyone listen this time?

Two documents often mentioned in contemporary discussions about nanotechnology are Richard Feynman's 1959 lecture "There's plenty of room at the bottom" and a report entitled *Nanoscience and Nanotechnologies: Opportunities and Uncertainties* that was published by the Royal Society and the Royal Academy of Engineering in the UK in 2004 (ref. 1). Feynman's lecture was highly prescient, and is certainly well worth reading again today, but claims about its influence on the development of nanoscience are often overstated because it did not receive meaningful numbers of citations until the 1990s (ref. 2). *Nanoscience and Nanotechnologies,* on the other hand, has been widely cited, and is also worth reading, but has proved less influential than many had hoped.

Among other issues, the 2004 report drew attention to the "lack of progress on research into toxicology, health and environmental effects of nanomaterials" and called for increased investment in research into the environmental, health and safety (EHS) aspects of nanomaterials. A series of government responses and reviews have followed, along with promises of funding for the necessary EHS research, but very little seems to have happened apart from the publication of more reports[3].

The latest in the series, *Novel Materials in the Environment: The case of nanotechnology*, was published by the Royal Commission on Environmental Pollution (RCEP) last month[4]. As Richard Jones writes on his blog, *Soft Machines*, the report is "well-written and thoughtful" but, not surprisingly, "some of the messages are depressingly familiar" (ref. 5). Indeed, the first recommendation essentially echoes the main conclusion of the 2004 report by calling for "a more directed, more co-ordinated and larger response led by the Research Councils to address the critical research needs raised by this report, with emphasis on regulatory and policy programmes."

The report discusses a number of different approaches to the regulation of nanomaterials — an "optimistic" approach that advocates doing nothing until there is clear evidence of harm; a less optimistic "risk-based" approach in which action is only taken when there are scientific reasons for concern; and an extremely cautious approach in which novel materials must be "demonstrated beyond any reasonable doubt to be safe" — but goes on to dismiss them all in favour of what it calls "an adaptive governance regime capable of monitoring technologies and materials as they are developed and incorporated into processes and products". This approach recognizes that the rate of change in science and technology is too great for existing inflexible modes of regulation. However, there is a downside — implementing such an approach will be more complex than the alternatives, involving a variety of early warning systems[6], watching briefs and environmental monitoring, all backed up by sound research.

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As part of this new approach, the RCEP recommends that regulators should focus on the properties and functionalities of new nanomaterials rather than their size, and calls for changes to the rules governing the use of chemical substances in the European Union (REACH; ref. 7). Other specific recommendations include increasing support for toxicology and making nanomaterials reporting mandatory because the existing voluntary reporting scheme "has not worked." Indeed, there have been only nine submissions from companies making or using nanomaterials to the government in the two years that the voluntary scheme has been running.

The UK consumer group, Which?, experienced a similarly low response when investigating the use of nanoparticles in cosmetics[8,9]. It approached 67 cosmetics companies, and although 17 responded, only 8 were willing to reveal how they use nanotechnology. Despite a number of scare stories in the media — including one headlined "The beauty creams with nanoparticles that could poison your body" (ref. 10) — the consumer group's chief policy adviser stressed that it was not opposed to nanomaterials: "We're not saying the use of nanotechnology in cosmetics is a bad thing, far from it [...] but until all the necessary safety tests are carried out, the simple fact is we just don't know enough." Which? is calling for a compulsory reporting scheme for manufactured nanomaterials and independent safety tests before they are used in cosmetics.

The need for mandatory reporting of nanomaterials seems self-evident, as does the case for a government-funded research programme along the lines proposed by the RCEP, but how many times must the government be told this?

References

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