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PHL-105-003

“Nanotechnology mainly consists of the process of separation, consolidation, and deformation of materials by one atom or one molecule.” Risk assessment is an obviously important practice which should be much more present in public discourse. Maybe it will be with the recent advances in nanotechnology, as quantum dot solar cells are looking to be extremely promising soon. The risks involved are scary, but the author seems to have some good ideas, such as the collection of medical data for the workers who manufacture nanomaterials for preventing adverse health side effects.

Risk is defined as the product of the probability of an event multiplied by a measure of its disvalue. Risk assessors make the tough calls regarding what model to use for estimating the effects of chemicals in manufacturing goods as well as medical practices. Even worse, if they focus on public health, they may be more likely to overestimate risks, but if they focus more on investors or their bottom line, thereby underestimating the risks. This is without even considering the degree to which we know about the potential harms, depending on what the *thing* is. Who’s funding the research to assess risk anyway? If it’s the same company doing the manufacturing with the chemicals in question, that would clearly not be ideal. Decision-making is differentiated by decision under risk, and decisions under uncertainty, where decision under risk refers to the times when it’s possible to assign probabilities to potential consequences linked to the decision. Decision under uncertainty refers to when there’s insufficient information to assign probabilities to the outcomes. However, “when an activity raises threats to harm human health or the environment, precautionary measures should be taken even if some cause-and-effect relationships are not fully established scientifically.”

The precautionary principle is basically how to proceed in the absence of information about the threat. I find myself in agreement with the goal of **PP**, since it includes societal input, as opposed to people on the technical side of things, which usually involve a skewed perspective of the matter at hand and that’s commonly at odds with the perspective of the public. It’s almost even democratic. Even if it seems too vague, we probably should DO SOMETHING… But I do think the burden of proof should be up to manufacturers, in a non-corrupt way, of course. If we can have a regulatory body to enforce the manufacturers to test the chemicals prior to marketing, that seems like a useful to establish. Robust policies are needed to for potential future scenarios, especially with regards to nanotechnology.

Particles within the range of 1 to 100 nanometers are referred to nanotechnology if they’re used for industrial purposes. Richard Feynman introduced us to nanotechnology in his talk, *There's Plenty of Room at the Bottom*, purely as an abstract idea. Now, we can make paint that can store the sun’s energy and paint houses with it! Quantum solar cells are looking promising among many other use cases of nanotechnology. The risks, however, is something I worry about regularly. The fact that these particles can go through your skin, cross the blood-brain barrier and are reactive as result of their surface area to mass ratio, does warrant concern. Not only by scientists and engineers, but all of society, since the promise is so large, we should assume a proportionality with the size of the promise with the size of the risk. Bill Joy’s “gray goo” is a good starting place, as I mentioned earlier, to assess the potential adverse events that may occur if this technology isn’t checked.

“Nanotechnology mainly consists of the process of separation, consolidation, and deformation of materials by one atom or one molecule.” This may be a “real-world experiment”, but as artificial intelligence helps us discover more mathematical concepts, as is being done today, I suspect our mathematical models will greatly improve, thereby improving our risk assessments. Or we could just have AI do the risk assessing for us!