

Nanotechnology: Just engaging in small talk?

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It is a commonly accepted fact that the very essence of technology is to make things that allow us to do more than we could without them. In many respects Christians should not fear technological progress as technology is not inherently wrong. Under the covenantal obligations we are still to adhere to today, stewardship of our created world requires some form of technology if we are to exercise dominion and "Be fruitful and increase in number; fill the earth and subdue it" (Genesis 1:28)

Christians believe that every human being is made in the image of God. We reflect God's image in what we do (capabilities and attributes) and what we are (our humanity). Therefore each human life has a unique dignity and unique value because of the divine image. In light of this we cannot "improve" upon human nature as this would involve altering the image which we bear. Nevertheless that does not mean we abandon or do not help those who may be sick, frail or handicapped. In fact this is where we can embrace new technologies in order to allow such people to enjoy a fuller and richer human experience than they would do otherwise.

Technology becomes a problem, however, when the boundaries of "being human" are exceeded and we enter into new "post-human" territory. One such technology which could potentially hold the key to entering into this new territory is nanotechnology. Often termed the science of the very, very small, nanotechnology is the manipulation of matter's most basic building blocks - atoms and molecules. Strictly speaking, nanotechnology is not a technology but rather a size - the nano-scale which atoms and molecules operate at, hence why the term "nanoscience" can also be used. A nanometer is one billionth of a meter; a human hair is roughly 100,000 nanometers wide. Nanomedicine refers to the direct application of nanotechnology in medicine.

The advent of nanotechnology represents what could be termed as a leap from the realm of science fiction to science reality. Technology forecasters point to nanotechnology as the key driver behind the "convergence" of other emerging technologies such as biotechnology, information technology and cognitive technology. Consequently, nano represents a "rebound revolution" reframing our understanding and engagement with science and technology as well as recasting the socio-economic relations of our day. This revolution does not occur in a vacuum but emerges within an existing nexus of profound legal, ethical, economic, social, medical and political questions which will help to shape and determine whether the future is one of sustainability or something far sinister. The key ethical issues raised by nanotechnology can be summarised within five key areas.

Safety

Some nanoparticles have been found to pass through the skin, offering exciting possibilities of targeted drug delivery. Conversely, given the size, nanoparticles could also interfere with the functioning of proteins on the surface of cells, or be taken up into cells and bind to intercellular proteins. How crucial is public awareness of these issues? For example, should there be a mandatory labelling system for sun creams containing nanoparticles?

Civil liberties

A further application of nanotechnology will present new possibilities for collecting new data. There is the potential for tiny sensors to be embedded in clothes, products or even bodies which could record and collect a multitude of data, including the movement of people, products, health and financial details.

Nano-divide

To date the advances and development of nanotechnology have been fuelled by a rich-world agenda, namely the manufacturing of products such as tennis balls, tennis racquets and laptop

computers. Such developments indicate that nanotechnology could well help to widen the gap between rich and poor and create what some have referred to as a 'nano divide'.

A post-human future

What could be termed the ultimate goal of nanotechnology is the creation of nanorobots; self assembling, self replicating nano devices which could be implantable into the human body and could therefore help to detect and destroy cancerous cells, infections, as well as repair genetic mutation and deliver precisely targeted drug therapy. Current research already points to the very real possibility of this being achieved. Such advances clearly look like holding much benefit and ongoing work and research into these kinds of applications should be encouraged.

On the other hand, the idea of self replicating nano devices running out of control naturally sparks comparison to the idea popularised by Eric Drexler and his 'grey goo' scenario where self replicating nanomachines run out of control, destroying humankind and the planet with the result that everything turns into 'grey goo'. Add to this the 'hijacking' of nanotechnology by the Transhumanist movement and the 'nano conversation' shifts to focusing on far more concerning and serious questions concerning the future of the human project as we know it.

At its heart, the Transhumanist movement advocates crossing over from where we are currently as humans to a post-human future. Any form of technology which allows us to live longer and be stronger and smarter is embraced by Transhumanism in order to get us out of our human skin and arrive at something better and superior - the 'post-human future'. Thus, Transhumanism has marked nanotechnology as their technology, in order to reach a post-human existence. If some of the grander ideas which nanotechnology would seemingly promise are believed to be true, then fusion between people and technology could occur like never before.

Life on a hard drive

Looking to the future, some believe that as the power of artificial intelligence, robotics and nanotechnology combine the possibility of immortality could be achieved. Having reduced humanity to a purely functional level by being able to mimic cognitive functioning through complex mathematic and computer modelling, the resulting binary information could be uploaded on a PC and then downloaded into robotic bodies or virtual reality programs. This whole process could be repeated however many times you would like thereby achieving virtual immortality. Moreover, the creation of superior beings who become our masters could be realised, or that we are able to 'enhance' our intelligence using a machine model and in doing so lose our essential humanity. Such an idea was popularized by Sun Microsystems co-Founder Bill Joy in his now infamous essay 'Why the Future doesn't need us' in Wired magazine, 8.04. April 2000. The line between natural and artificial becomes blurred as the day of the post-human dawns

But why should we be bothered? Is a post-human really going to become a reality?

Given the rate of progress and development in these areas posthuman thinking needs at least to be recognised, discussed and engaged with. The basis of such an argument is based upon two key points. First, even if the predictions about virtual immortality are never met for example, we cannot fail to recognise the extent to which technology shapes and characterises our lives today. In engaging with the post-human question, one is naturally led to ponder what does it mean to be human and that will without doubt involve the consideration the place of technology in our lives.

Second, the post-human discourse is helping to shape a vision of the future and influence the subsequent policy making decisions, even if such a future is never fully realised. In other words, the moral and ethical convictions which help us shape our thinking about the future, in actual fact also shape our thinking about the present. Talk of a post-human future should therefore prompt us all to engage with the developments in nanotechnology as well as other emerging technologies in order to consider what it means to be human both today and into the future.

As the need increases for the ethical, legal and social implications (ELSI) to be considered and incorporated into the policy conversation, there is also the need for such a conversation to be enriched by the contribution of the Christian community. As Christians we can raise the issue of what it is to be human in a technological civilisation, thereby seeking to shape policy from a pro-human as opposed to a post-human perspective.

If you have been unfortunate enough to experience sharing a bed with a mosquito, you will know that you may not be able to see the mosquito but you will certainly feel its effects. In like manner, we may not be able to see what takes place at the nano scale with the naked eye but we certainly look set to see its effects on our world. To what extent these effects are felt is largely going to be determined by how far we are going to allow a revolutionary technology to quite literally reshape our lives.