Puss in Boots

*Dreams, Hopes and Uncertainty in the Nano Revolution*

Emilio Mordini, M.D.
Centre for Science, Society and Citizenship, Rome, IT
[emordini@bioethics.it](mailto:emordini@bioethics.it)
Man is equally incapable of seeing the nothingness from which he emerges and the infinity in which he is engulfed
B.Pascal
Introduction

As a psychoanalyst who has worked for years in technology ethics, I have always been particularly interested in a claim which is often repeated, that is that the technological revolution has posed totally new ethical questions. But is this true? And if it is, in what way? Some of the knots in current technology ethics depend on the answers to this question.
Introduction

My central argument is that nanotechnology – obviously as an ideal project - is not at all new. I shall argue that the nano dream stems from the baroque age and from its fascination and fear towards wonder and infinity. Wonder and infinity – I would like to suggest – are two key words to understand the wider social implications of the nano revolution
Introduction

I am aware that in placing the baroque period at the centre of my argument I am challenging traditional approaches to ethical and social implications of nanotechnology. There are, however, several good papers devoted to ethical, legal and social aspects of nanotechnology and some of them are being presented in this very conference. As far as I am concerned I just aim to provide a number of suggestions and raise a number of questions. If I succeed in doing this, I shall have achieved my goal.
Nano Tales

Human beings – states Blaise Pascal, who was the paradigm of baroque scientists - are suspended between two infinities: the infinite large and the infinite small. We are attracted and repelled by both, because in them we divine our destiny, without knowing whether that destiny is a destiny of eternal life or eternal nothing.
Nano Tales

It has long been a dream of human beings to explore and eventually to manipulate infinity. For centuries mathematics have done the job. In XX century scientists have started to tempt to construct microscopic machines – motors, valves, sensors and computers – down at the molecular scale. They could be implanted into larger structures where they would carry out their invisible function. Such devises are now a reality and scientists, policy makers, industry people, journalists have called nanotechnology the foundation for the "next industrial revolution".
Together with enthusiasm there is also a lot of hyperbole and anxiety over nanotechnology accompanied by an overperception of risk. Of course, legitimate ethical social issues do exist as usual. These include, for instance, privacy concerns, health risks from nanoparticles in the environment, and alienation from technology by those who distrust it. Scientists, engineers, and government officials must confront head-on the ethical and societal implications of nanoscience and nanotechnology in order to keep the field from falling victim to the obstacles that have hampered progress in biotechnology.
Nano Tales

Yet solid scientific assessment of risks in not enough.

There's a real obligation on the part of the scientific, industrial and political communities to go more in depth in their understanding of people anxiety about nanotech.
The ability of societies to master technology shapes their destiny. Technologies don’t develop according to an irresistible, internal technical logic. Technology is not driven by technical necessity alone in certain, predictable directions.

Actually technology is a cultural product and, in its turn, it is a producer of culture. Technology is a social practice that embodies the capacity of societies to transform themselves. Technology implies the capacity to create and manipulate symbols and culture of a society. In other words behind any technology there is one or more narratives, which are somehow its “unconscious”.
I argue that one of the main narratives behind nanotechnology is fairy tales.

Nanotechnology fairy tales started from the very beginning when Eric Drexler warned that "replicating assemblers and thinking machines pose basic threats to people and life on Earth".

In 2000, Bill Joy wrote a chilling and widely read article warning that self-replicating nanomachines could eventually overwhelm the human race.

Then came Michael Crichton’s "Prey" - where nanomachines run amok.
Nano Tales

The roots of the nano tale may be traced back to old fairy tales at least in their essential features.

The trope of little people, pixies, small folks and other magic – sometimes mischievous – creatures, living in parallel worlds or anyway hidden, is a common trope in fairy tales.

Also magic objects which serve their master - a child, a young girl or a boy – are a trope of fairy tales.

Nano tales thus merge these two tropes.
Nano Tales

As a literary genre fairy tales find their origins in the baroque age.

The Baroque period is stylistically complex, even contradictory.

A key feature of the Baroque age is an obsession with wonder and novelty. Even the fascination for infinity – that can be easily traced in mathematics, philosophy, religions, art, music, science, literature – can be subsumed under the love for wonders, in a typical mixture between pleasure and fair, which is another distinctive feature of Baroque.
I’m not certainly the first who notes that there is a number of similarities between our time and the Baroque age. We live – one can even say – in new baroque period. In particular there are impressive similarities in the way in which post modernity – or late modernity as some prefer to call our time – and Baroque deal with science and technology.
Wonder and Science

The most important feature shared by Baroque and Post Modern way to communicate science is the importance given to wonder.

What shapes public opinion is more the way in which scientific discoveries are presented to the public than their actual essence. In turn, the way in which the public is formed affects scientific research, both by influencing funding agencies and exerting psychological pressures on researchers.

Baroque scientists, philosophers, artists were meant to surprise the readers, hearers, and spectators and thus helped to convey the impression of total novelty and originality, which mirrored a totally new world picture.
Wonder and Science

The Italian Baroque poet Giambattista Marino expressed this principle in a memorable couplet:

*E del poeta il fin la meraviglia [...] Chi non sa far stupar, vada alla striglia*
Wonder and Science

Wonders have been never neutral in political, social, and ethical terms.

Wonder in Baroque age was the mainstay of political practices. As masses of urban people became increasingly visible and politically active, sophisticated forms of control and manipulation were designed and implemented by the establishment.
Wonder and Science

Complex choreographic apparatus in political ceremonies, trompe l'oeil in church frescos, extraordinary automata and powerful new weapons were meant to stir the wonder of people.

Celebrated for the ingenuity of their authors, these wonders entertained the elite while seducing, ruling and controlling urban multitudes.
Wonder and Science

Post modernity is confronted with revolutionary and accelerated changes in science and technology that challenge in different ways some basic implicit and explicit moral assumptions and legal norms.

Scientists, policy makers, “journalists” must help people to elaborate the change of their worldviews. Wonder is a key instrument to convey a new world picture through scientific communication. Of course wonder may also be a powerful tool for social control by only inspiring feelings of respect, fear and fascination.

Yet by exciting curiosity wonder may also promote a true public understanding of new technologies.
Conclusions

I would like to conclude with two remarks and one final consideration.
First Remark

My first remark concerns the importance of studying the collective imaginary that surrounds nanotechnology. Impact studies are certainly important but we also need to understand the way in which people “metabolise” information. Different narratives are used to process information. Some of them trace back to the origin of the mental life. Like the myth and the legend, the fairy tale touches the most primitive parts of the psyche.
Second Remark

My second remark concerns the importance of letting people to elaborate their impact with nanotechnology. In a study conducted in the spring of 2004 by North Carolina State University on the public’s perceptions about nanotechnology, people who have read Crichton’s novel “Prey” surprisingly showed a more positive attitude towards nanotechnology than those who did not read the novel. Tales are an important element to allow people to deal with complex and contradictory novelties. They allow to handle fears and to overcame them.
Final Consideration

History teaches that worrying overmuch about technological change rarely stops it. If we are concerned about ethical and social implications of nanotechnology, we would do better to form a clearer picture of how scientists and policy makers should communicate with the public and, above all, we should refuse any temptation to reject popular narratives as naïve and misleading. On the contrary popular narratives can give us the key to understand what is going on in public’s mind and they can be an important instrument to help people to elaborate fears and hopes.