



The next 100 years

A Futurizon Report

August 2008

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With the accelerating development of technology, we can look forward to the next 100 years with the certainty that it will bring more change than the last millennium. Nano-bio-info-cogno convergence will lead to the mastery of materials, synthetic intelligence and consciousness, and the technology of life itself. As well as redesigning nature to include superior synthetic biology, and repairing our environment, we will bring about the forging of ever closer links between man and machine, ultimately leading to a full direct brain link, extension of our minds into the machine world, and hence electronic immortality. Meanwhile, rapid progress in space technology will enable our first colonies away from Earth.

It is perhaps hard to see this as anything other than science fiction when today we are bombarded with doom and gloom from environmentalists and witnessing the restart of the cold war. But problems don't stay around for long before people start to fix them. Just as newspapers tell us daily that we have to take our lifestyles back to the 19th century to stop global warming, engineers are already well under way designing solar technology that will see huge solar farms in the Sahara providing almost all of Europe's energy needs, delivered across superconducting cables. Rather than environmental catastrophe, it is more likely that we will see a carbon-free transport system and most of the remaining oil being left in the ground. Fleets of electronic and electric cars will be more socially inclusive than even public transport today, as well as much cheaper, faster, safer, more reliable and of course cleaner. Sustainability is best achieved by means of the application of human intelligence to solve the problem, not by trying to wind the clock back with policies formed from muddled thinking. Future Queen's science and engineering graduates will do more to solve environmental problems than any number of green doomsayers. Old political systems will gradually give way to a more unified world order based on heavily networked grass roots people power, where poor leaders can more easily be rendered powerless.

The real problem is not trying to keep technology pace going, but to make sure it doesn't proceed too fast for our society to keep up, especially legal and regulatory systems. In AI, the exponential curve hasn't turned vertical yet, so people dismiss far too easily any talk of conscious machines. But give it another decade and nanotech-based probes in brains will have given computer engineers enough insight to make nano-electronic gel, in which guided evolution can take our initial ideas and build on them to deliver not only consciousness, but vastly superhuman intelligence. We will need to make sure that no-one builds such a machine before we have the related technology to link such intelligence to our own human brains so that machines can't gain a dangerous advantage.

Similarly, with the ability to design and build life, we will see the creation of many new life forms, and even new kinds of people, with babies built to taste, unless appropriate regulation is made in good time. Already, it is easy for any two people to have their genomes listed on a CD, and then randomly combined, the resulting billions of potential individuals' DNA listings just waiting for off-the-shelf assembly before they can be 'built', gestated and born. Yet it is still entirely legal to sell such listings, which carry no legal rights yet. Many other ethical milestones will pass by unnoticed as technology accelerated behind lab doors. We have to hope that engineers in the future will be much more openly analytical of the potential social consequences of their work.

It is obvious already that the previously clear boundaries of electronics, life sciences, materials and neuroscience are being eroded. Interdisciplinary is already key to university success. If UK plc is to stay in business, we will need to educate people across many disciplines. It is always areas of convergence that yield the highest market potential, just as the merging of computing and telecoms gave us the web and all its markets and consequences. Biotech is already converging with IT, enabled in part by nanotechnology. We must not let our universities fall behind the rest of the world in this space. Provided we can stay in the race with our foundations of wealth creation, we will also be able to afford the luxuries of the arts that make life worth living. Queen's has served well in both spheres for the last 100 years. Let's make sure it plays its part in the next 100.

ABOUT THE AUTHOR

Ian Pearson graduated in 1981 in Applied Mathematics and Theoretical Physics from [Queens University, Belfast](#). After four years in Shorts Missile Systems, he joined BT Laboratories as a performance analyst, and later worked in network design, computer evolution, cybernetics, and mobile systems. From 1991 until 2007, he was BT's Futurologist, tracking and predicting new developments throughout information technology, considering both technological and social implications. He now does exactly the same things for Futurizon, a small futures institute. As a futurologist and consultant, he lectures widely on his futures views. In between conferences, he writes on topics such as machine consciousness, human evolution, women's issues, ageing, social trends and advanced computing technology.

He has received many awards for his papers, written several books and has made well over 400 TV and radio appearances. He is a Chartered Fellow of the British Computer Society, the World Academy of Art and Science, the Royal Society of Arts, the Institute of Nanotechnology and the World Innovation Foundation. He was recently awarded an Honorary Doctor of Science degree by the University of Westminster.