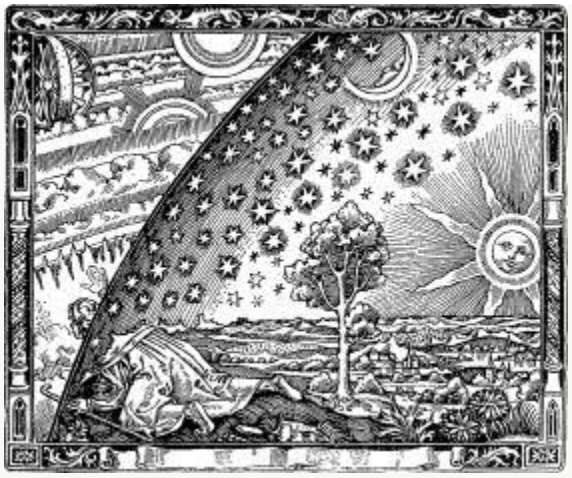
HOW SUSTAINABLE IS FUTURE TECHNOLOGY GROWTH?

We certainly live in the future. The smallest features on computer chips are reaching atomic dimensions. At the same time, biotechnology has advanced so much that molecular biologists are working on synthetic biological cells. One of the promises behind these efforts is that perhaps genetic engineering could deliver tailor-made cures for diseases. But in a world of seven billion people and growing, how realistic is it still that such advanced technologies from atom-sized computing to genetic engineering could benefit all mankind?



The Flammarion engraving. Photo via Wikimedia

The Flammarion engraving above is a beautiful expression of human curiosity, to seek out new knowledge of the world around us. So far the understanding has always been that the fruits of such curiosity are shared by everyone.

Whether it was the use of fire in prehistoric times to electricity from the 19th century onwards to mobile phones in recent years. Indeed, the past decades have seen an accelerated uptake of technologies such as the internet. On a more personal level, advances in healthcare have considerably increased life expectancies.

Keeping up with technology

This trend, however, might be difficult to maintain. How realistic is it that everyone will be able to have a smartphone with the latest memory processors? Perhaps it is possible that prices do come down enough for this. But what about more expensive items such as electric cars? Their batteries rely on lithium technology,and lithium does not seem sufficiently abundant to make cars on the same scale as those with internal combustion engines, where there are hundreds of millions of them. Half of all the global lithium reserves are concentrated in a single, huge salt flats in Bolivia. Moreover, the motor in an electric car requires magnets made from rare earth elements, which have seen their own supply shortages.

Although contrary to what their names suggests, there are plenty of rare earth reserves, their mining requires a lot of effort and it again remains to be seen whether there will enough supply for millions of cars.

In other words, supply issues and increasing engineering costs could fundamentally prohibit the uptake of future technologies by the majority of the world's population.

How personal can healthcare get?

Such technology worries might not concern everyone. Not everyone will see the need to own the latest computer technology or drive electric cars when a bicycle might still do. But healthcare might be a more personal issue. Advances in vaccination that led to the eradication of smallpox, and hopefully soon also polio, benefit the whole population.

Perhaps less so for individualized healthcare, especially in the age of genetic engineering. Certainly, genetic sequencing has come a long way, and the cost for sequencing a human genome will soon be below a thousand dollars, and could even come down to a hundred dollars. This will provide wide-spread individual access to the entire genome sequence. Yet, whether everyone will have access to tailored healthcare based on this genetic information will remain to be seen.

The question is perhaps again one of resources. Will it be possible to scale such customized healthcare up to the scale of billions? The increasing costs of healthcare in the developed world suggest the opposite.

There certainly is a cost difference between producing a flu shot for everyone and studying genetic markers for potential diseases in individuals.

Where will this lead us?

There can be no doubt that remarkable technological advances still lie ahead of us. Many of our dreams of what will be possible will come true, and there is certainly no reason to stop dreaming.

Increasingly, however, the question with modern technologies is how scalable they are. Will it be impossible for everyone to benefit from what is being developed in research labs? And if so, will this lead to an again widening gap between developed and developing world? Technology so far has been a major enabler for economic growth in developing nations, but there is no guarantee that it should remain so. Could this lead to international conflicts, for example over scarce raw materials?

It seems that in a world where the United Nations are concerned even about future water and food supplies, technological advances might be affordable only to an ever decreasing market. Unless the development of such techniques starts to take sustainability and the availability of resources into account. Less use of rare resources but more reliance on widely available source materials.

An emphasis on reuse and not on throw-away technology as seen with mobile phones. Technological advances need to continue to be in everyone's reach and for everyone's benefit.

Source: http://allthatmatters.heber.org/2013/06/26/how-sustainable-is-future-technology-growth/