

Futurism – “1948” Revisited

“The Future is an unknown country”

Many Futurists

- Leonardo da Vinci – envisaged flying machines
- Vannevar Bush – envisioned the internet
- H.G. Wells – envisioned tanks and space flight
- Isaac Asimov – science fiction novelist and social scientist
- Aldous Huxley – wrote *“Brave New World”*
- Alvin Tofler – wrote *“Future Shock,”* envisaged the digital revolution
- Michael Crichton – developments in medical science

Brave New World

- “*War of the Worlds*” (1898) by H.G. Wells, one of the first science fiction novels, projected a futuristic encounter with aliens
- “*Brave New World*” (1932) by Aldous Huxley, a very influential futuristic novel, was a dystopian version against the prevalent scientific utopias envisaged by H.G. Wells and others.
- As such it is a compromise, not truly a scientific vision (no computers, no robots) but largely sociological, envisaging society as having been doomed by excess of control, information and trivia.

Post WWII - Two divergent visions of the future

- “1984” (1949) – Orwell:
Totalitarian, repressive, scarcity
- “*The Singularity is near*” (2006) - Kurzweil:
Technological, robotic, plenty
- *Both views of the future were influenced by the experiences of the writer*
- Which is more likely to become the future?

The worlds they experienced

- *Orwell*: Born 1903, in northern England, his experiences in Spain ("*Homage to Catalonia*"), a world in conflict with totalitarianisms, Nazism, Stalinism, the betrayal of allies by the Stalinists
- *Kurzweil*: Born 1948, growing up in the US post-WWII, a world of affluence, technological development and plenty
- How could they not envisage totally different outcomes for the future?

Typical quotes

- **Orwell:** *“If you want a vision of the future, imagine a boot stamping on a human face - forever.”*
A predominantly *political* vision
- **Kurzweil:** *“By the 2030s, the nonbiological portion of our intelligence will predominate.”*
A predominantly *technological* vision

Is it possible to predict the future?

- Apart from some brief and periodic events (such as planetary motion) the short answer is NO!
- Is it possible to predict the evolution of human society – definitely not! One can only guess probable outcomes.
- Human history is full of unpredictable events – was the outcome of WWII inevitable?
- No-one predicted the downfall of the Soviet Union or the visit of Pres. Sadat of Egypt to Jerusalem

Scientific medicine

- In the last hundred years the age at mortality of most humans in the developed world has risen significantly, from ca. 50 to ca. 80
- This is attributable to our understanding of germs (bacteria and viruses) and of basic research in biochemistry
- And to the development of scientific medicine and hygiene
- But, it has led to the prevalence of many new diseases of the aged, such as Alzheimer's Disease

Agriculture and energy consumption

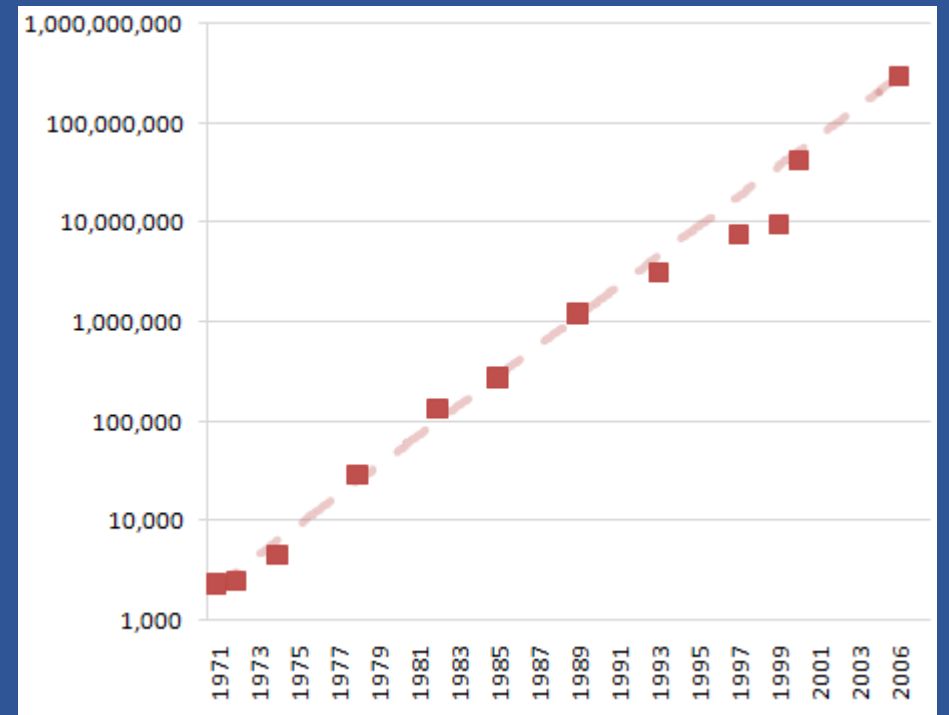
- A study called “*Limits to Growth*” by the Club of Rome in 1972 (Meadows et al) predicted that the human population would outstrip food and energy supplies, thus leading to catastrophe and a breakdown of civilization
- However, this has proven to be a faulty model
- With **genetically modified** (GM) plants and modern drip irrigation there should be no future shortage of food
- Current models for energy supply that include such sources as shale oil, fracking, solar, wind, water and wave energy are much more optimistic

The human factor

- At every stage of human history there have been movements that have attempted to “take over” the world
- From the 19th century these have taken the form of ideological movements, socialism, communism, fascism, and Nazism
- All of these have been defeated, but at great cost
- Now Islamism represents a world-wide challenge to the supremacy of the Western Judeo-Christian liberal tradition

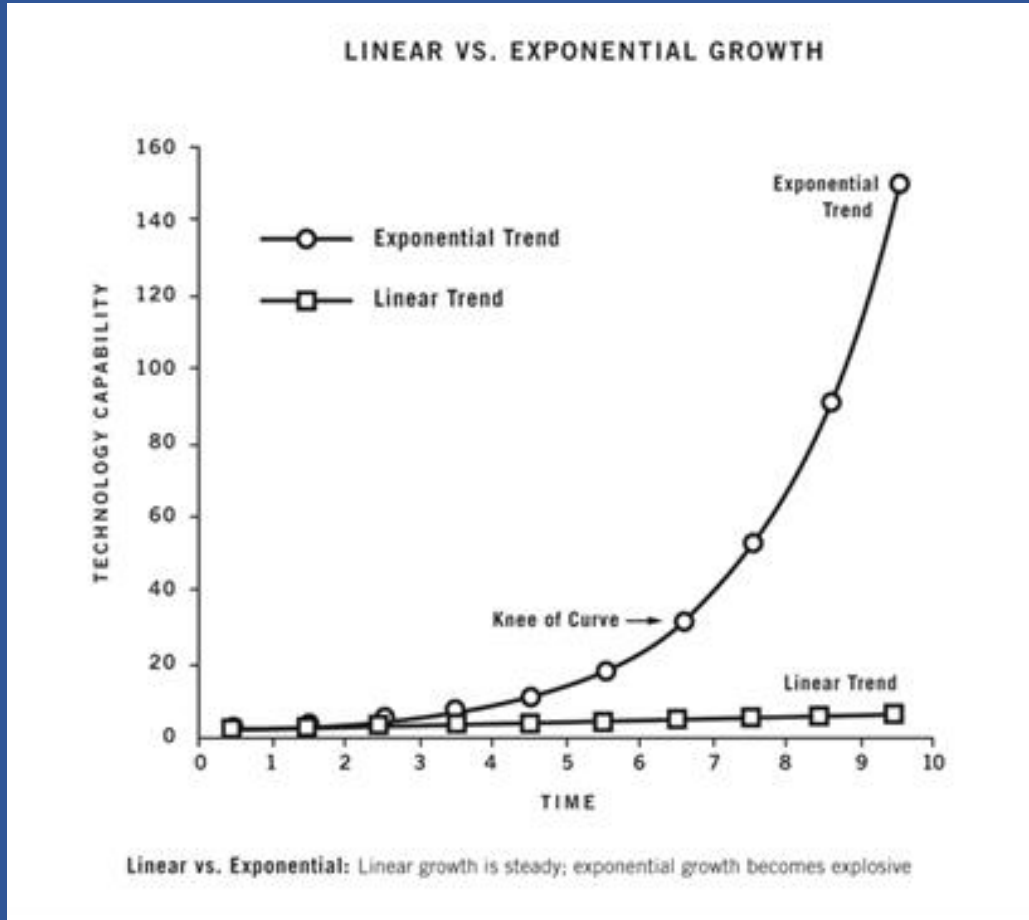
Technological development

- **Moore's Law:** is the observation that, "over the history of computing hardware, the number of transistors in a dense integrated circuit has doubled approximately every two years."
- But, the practical limit to Moore's Law now seems to have been reached.















The singularity

Kurzweil's view is based on an *exponential growth in technology* and an eventual merging of man and machine or brain and computer

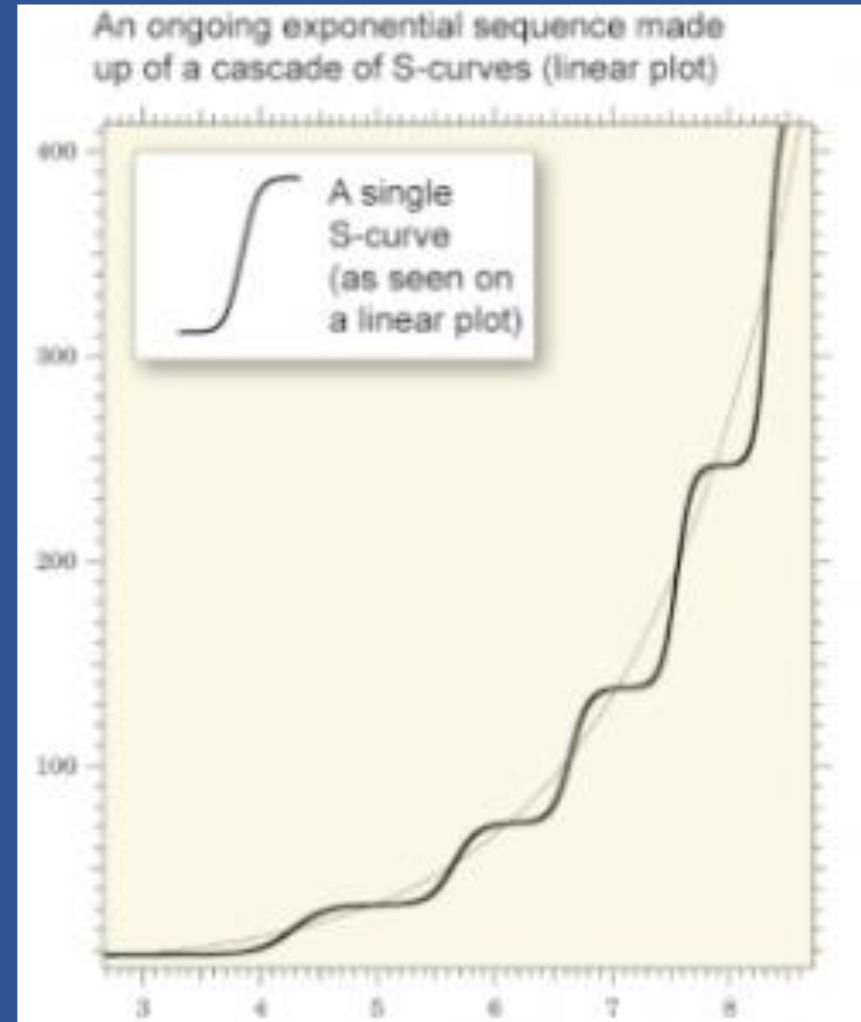


Progress Obsolescence

- Music: records  LPs  CDs  iPods
- Photog: film  digital
- Computer memory: valves  semiconductors 
microprocessors
- Computer storage: floppy disks  CDs  solid state
- Phones: land-line  mobile  cellular 
smart phone
- TVs: cathode ray tubes  LCD

Is growth exponential?

- This is Kurzweil's key concept. He claims that the summation of a series of "S" curves is an exponential.
- But this is not correct, it has an upper plateau.
- The equation for a summation of "S" curves *cannot be an exponential!*



Current/future

- No-one predicted the amazing development of smart phones, computers in the hand
- No-one predicted the use of GPS in every car and boat
- No-one predicted the amount of information available via the web
- In the future will babies have information chips inserted into their body? (no need to fill out forms)
- Facial recognition software at all institutions
- Will babies/people have smart phones attached to their brains?
- All information would be instantly available?
- Will this result in information overload?

Robots

- There are many kinds of robots
- Simple robots do routine tasks, like a washing machine, a dishwasher or a vacuum cleaner, all things that they do more efficiently than humans
- There are robots that do repetitive tasks without tiring, such as making automobiles and running power stations
- Complex robots can do very sophisticated tasks, like drive cars, play chess and go and beat the best humans, because they have memories that store millions of games, and they can learn

Cyborgs

- A Cyborg is defined as a combination of a man and a machine, a human equipped with a mechanical or electronic device
- A simple example is an amputee with a mechanical/electronic limb (hand, arm, foot or leg). Hugh Herr at MIT has designed electronic bionic limbs with feed-back
- A more complex example is the use of an exoskeleton that is equipped with a computer that enables a cripple to walk

A current generation exoskeleton

- It is light weight
- The battery is worn as a backpack
- The battery lasts for 8 hours
- It is not attached to the user



Cyborg fighting machine

- From the movie “Avatar”
- The man sits inside the machine and controls it



A truly bionic man or Cyborg

- A Johns Hopkins program funded by the US Army in 2014
- The man controls the movements of his arms, hands and fingers with his own thoughts.
- But, still very limited and expensive



The Test

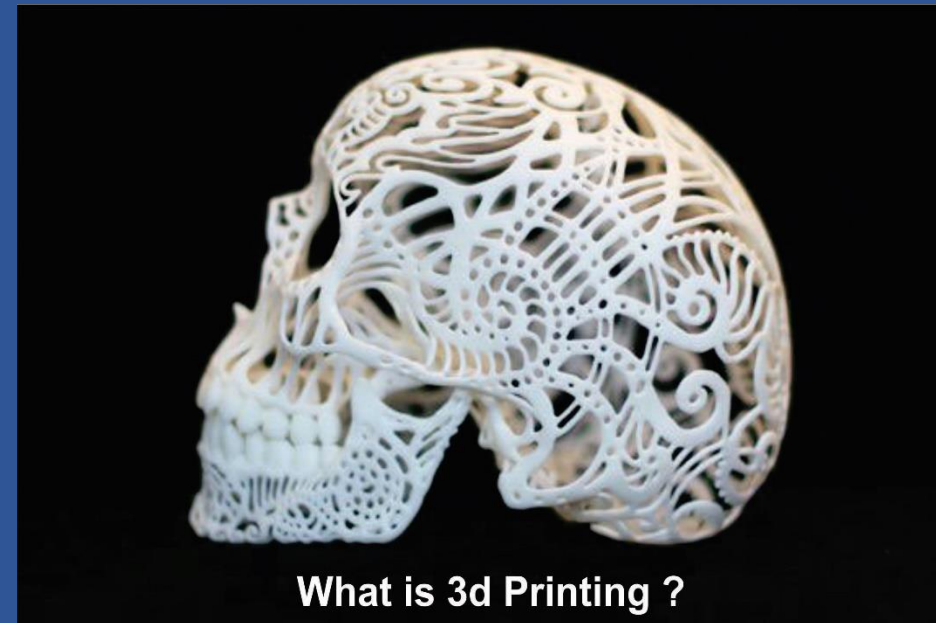
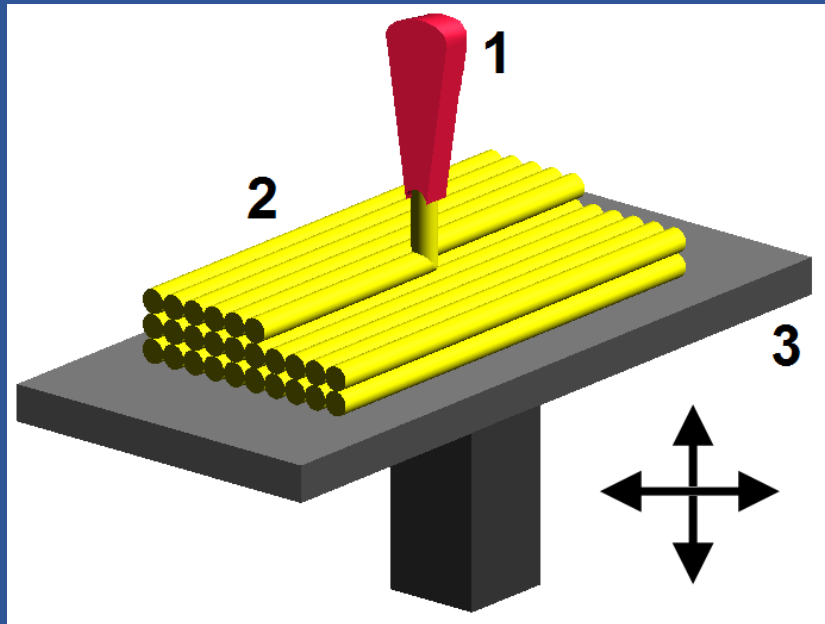
- *The Turing Test*, proposed by Alan Turing: AI will have been reached when one cannot tell whether one is communicating with a man or a machine.
- I propose the Cohen Test: In current movies about robots, humans play the robots. I predict that if a robot can play itself in a movie, or even better if a robot can make a movie that is appreciated by men, then we will have reached a new state of being.

Predictions

- We will ultimately defeat Islamism because they have no positive program to attract people and they lack resources
- Technology will solve our need for food and energy
- Computers will achieve AI and with more robotic uses, more and more humans will become Cyborgs
- However, I do not believe that there will be a “*singularity*” as predicted by Kurzweil, rather I believe in a *multiplicity* of outcomes

Dispersion of technology

- Digitization, the internet of things
- 3d printing – make almost anything, anywhere
- Fab Labs, local fabrication using 3d printing, laser cutting and local materials, including biological materials



Conclusion

- To quote Winston Churchill in his “this was their finest hour” speech of 1940:
- *“all Europe may be freed and the life of the world may move forward into broad, sunlit uplands.”*