

Our second nature : between technological control and self control

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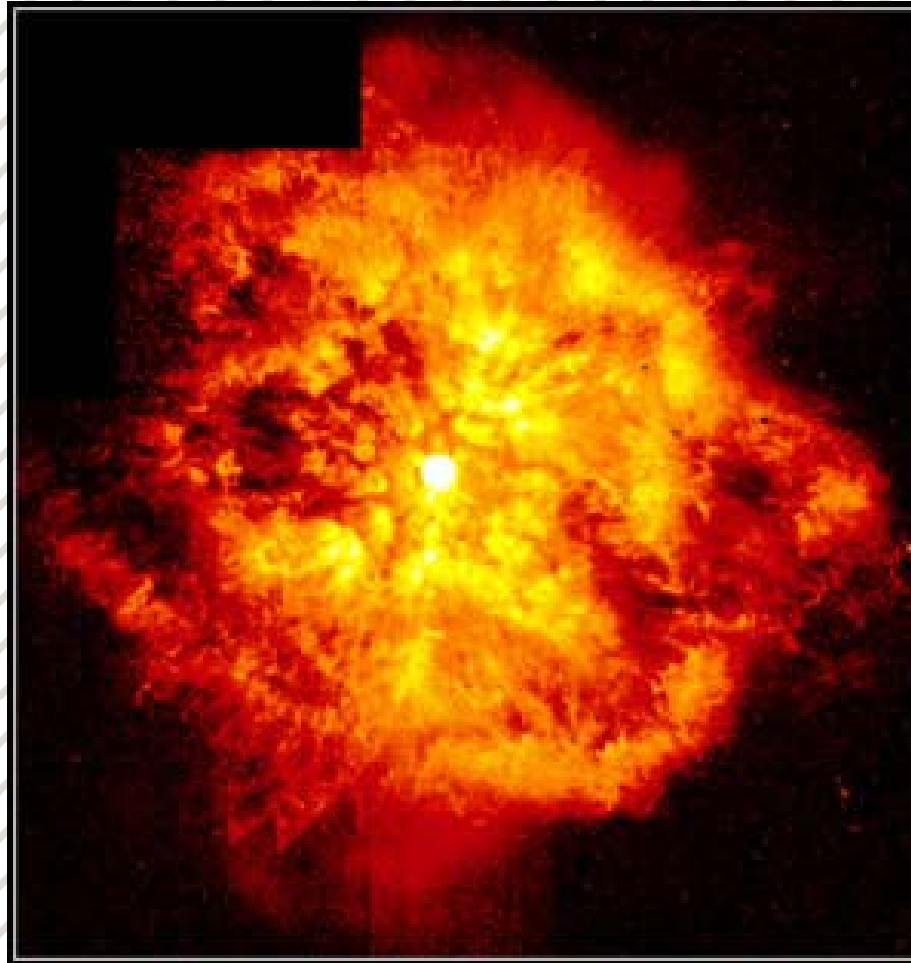
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Big Bang: 13,5 billion years ago

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Human enhancement: million years ago

ORNA KENNIS IN NG
VERANDEREN IN HET VERZOEK
DEELTAKEN IN WETENSCHAP
TECHNIEK EN SCIENCE

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Human culture: ideas and fire 100.000 years ago

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Agricultural revolution: 10.000 years ago

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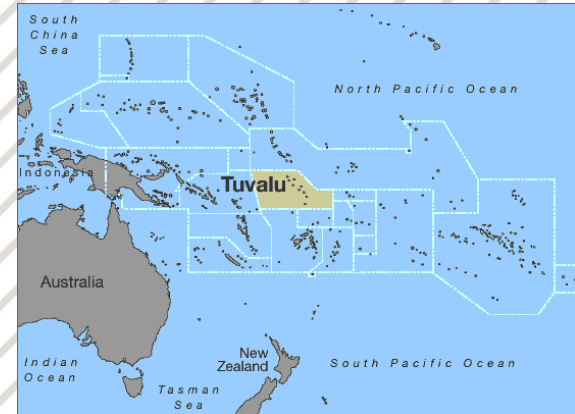
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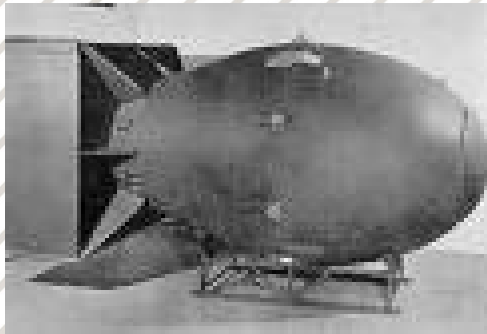
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Our Second Climate





Triad of controls (Elias)



**Self
control**

**Technological
control**



**Social
control**

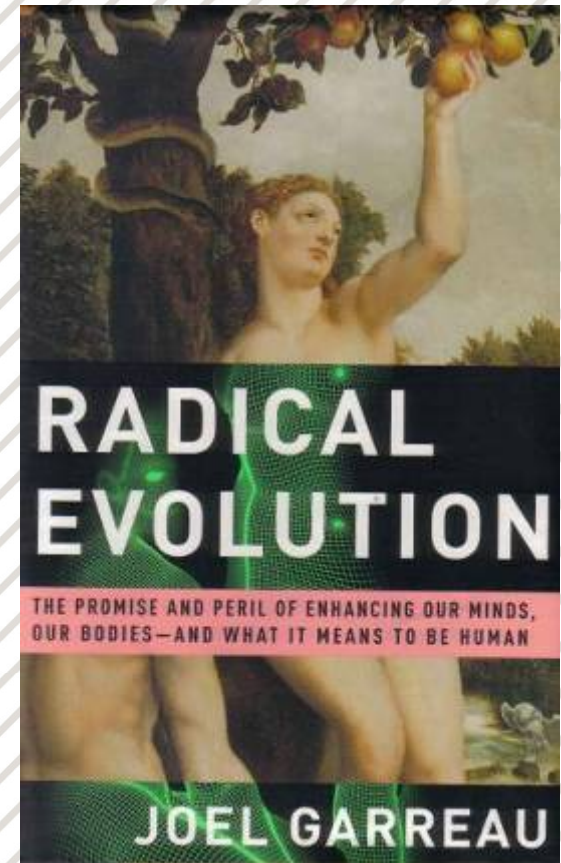
Information revolution: 50 years ago

“Living machine age”

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- “We are at an inflection point in time.
- For all previous millenia, our technologies have been aimed outward, to control our environment. ...
- Now, however, we have started a wholesale process of aiming technologies inward.”
- (Garreau 2004: 6)



Living machines / technologies



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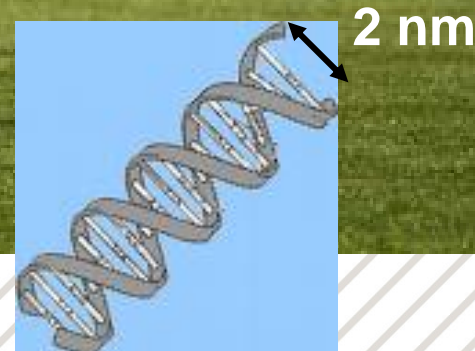
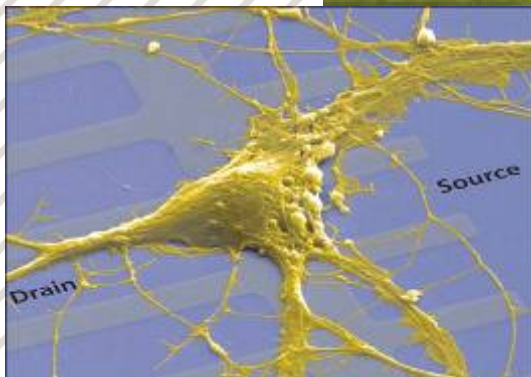
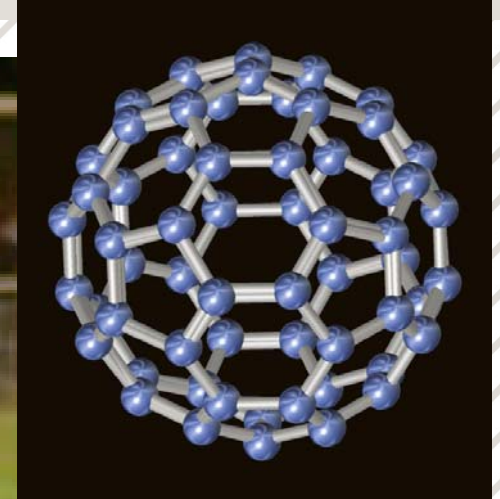
- **Living machines as perfect machines**
 - **Exploring and learning**
 - **Modeling and using design features**
 - **Rebuilding**

- **Living machines as imperfect machines**
 - **Looking for design imperfections**
 - **Improving the living machine**

From global to nanoscale

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NBIC convergence: a new big BANG

Nano

Synthetic biology

Bio

Personal genomics

Aml in Health Care

Medical devices

RFID

Social robots

Human enhancement

Public space 2.0

Brain sciences

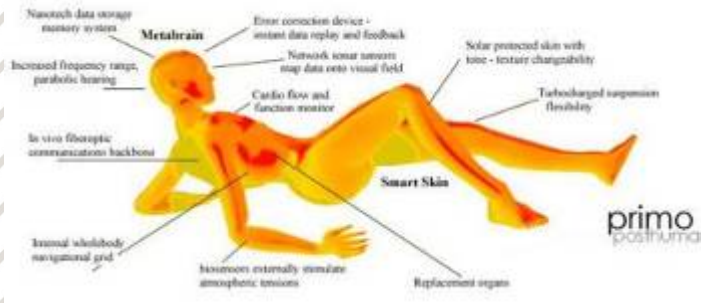
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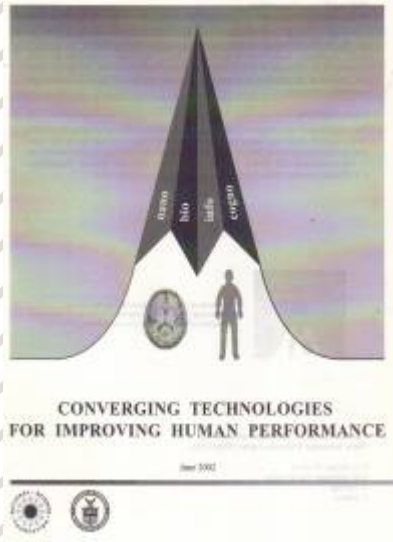
The transhumanistic dream: human enhancement



Bill Joy



Rodney Brooks: “The generalisation we are facing is that we people are machines, and as such subjected to the same technological manipulation that we now routinely apply on machines.”



Modifying, copying, enhancing living machines

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**Cloned sheep Dolly:
“First the sheep, than
the shepherd?”**



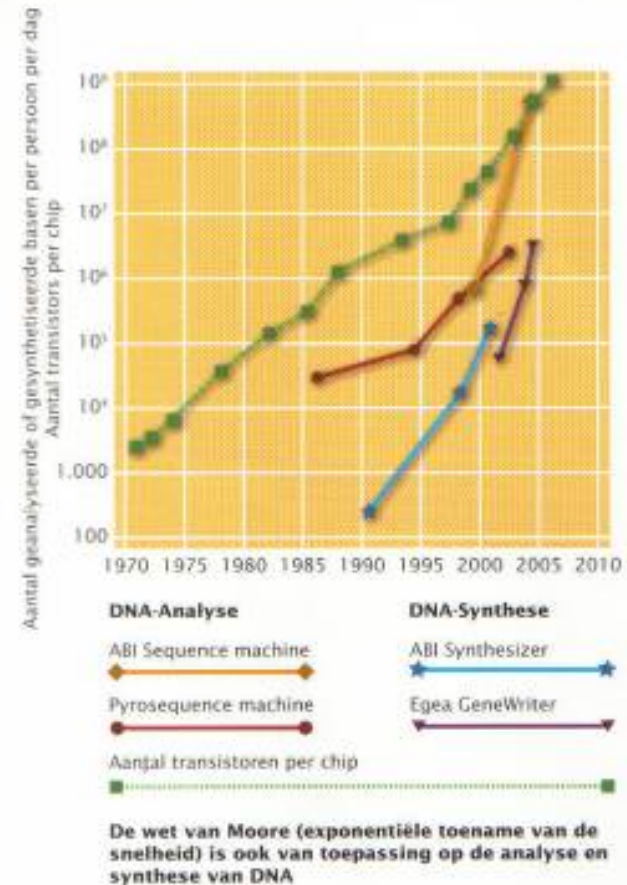
Bull Herman

Digital biology

or the story of Leroy "Hood"- machines

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Waiting for Synthia: first synthetic bacteria



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I am creating artificial life, declares US gene pioneer

- Scientist has made synthetic chromosome
- Breakthrough could combat global warming

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Ed Pilkington in New York

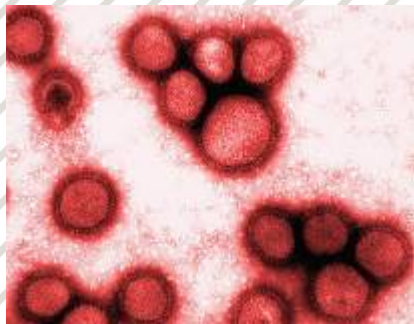
[The Guardian](#) Saturday October 6 2007

Craig Venter, the controversial DNA researcher involved in the race to decipher the human genetic code, has built a synthetic chromosome out of laboratory chemicals and is poised to announce the creation of the first new artificial life form on Earth.

The announcement, which is expected within weeks and could come as early as Monday at the annual meeting of his scientific institute in San Diego, California, will herald a giant leap forward in the development of designer genomes. It is certain to provoke heated debate about the ethics of creating new species and could unlock the door to new energy sources and techniques to combat global warming.

Mr Venter told the Guardian he thought this landmark would be "a very important philosophical step in the history of our species. We are going from reading our genetic code to the ability to write it. That gives us the hypothetical ability to do things never contemplated before".

2002

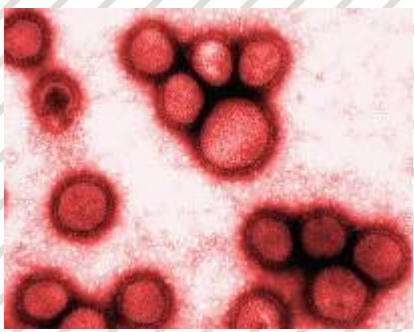


Spanish
Flu Virus

First Synthia, than Dolly, than the shepherd?



2002



Spanish
Flew Virus

2009?

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I am creating artificial life, declares US gene pioneer
 • Scientist has made synthetic chromosome
 • Breakthrough could combat global warming

Ed Pilkington in New York
 The Guardian Saturday, October 10, 2009

Synthia

Mr Venter told the Guardian he thought this landmark would be "a very important philosophical step in the history of our species. We are going from reading our genetic code to the ability to write it. That gives us the hypothetical ability to do things never contemplated before".

Venter: "First
synthetic
bacteria"

2012?



Endy: "First
artificial
mammalian
chromosome"

2015?



Voigt: "First
artificial
human
chromosome"



Opinion article, February 12, 2008: “Artificial life deserves a clear debate” (Van Est & Walhout)

- May we create human pathogens?
- May we create human chromosomes?
- May we put human chromosomes in animals?
- May we put an extra pair of chromosomes in a human embryo?
- Which life forms do we permit?

Current debate on embryo selection

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Minister Klink en Secretary of State Bussemaker



Huntington disease



Down Syndrom



Charlie & Jamie Whitaker



Squint

AZ Jette creëert *saviour-baby's* voor behandeling ziek broertje of zusje
Reddende engeltjes geboren



ANTWERPEN - In het AZ in Jette zijn twee *saviour-baby's* geboren, een primeur voor ons land. Reddende engelen zijn het als het ware, die via hun navelstreng hun doodzieke broer of zus kunnen genezen. Precies daarom werden ze uit een reeks embryo's geselecteerd en teruggeplaatst bij de moeder. Begin dit jaar kwamen ze ter wereld.

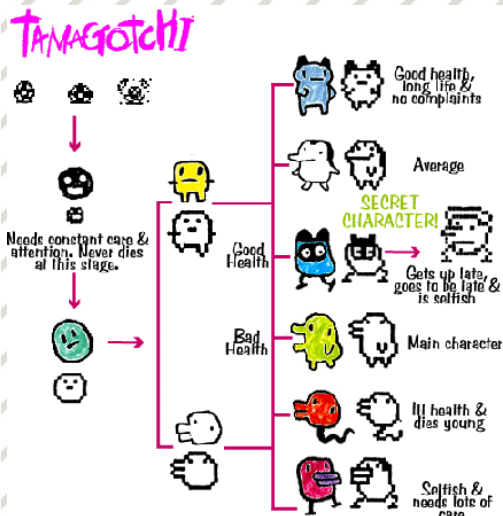
Deep Blue beats Kasparov (May 11, 1997)

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Digital friends & small talk



Therapeutic robot Paro



Hanson robotics



Elbot: "almost passed the Turing test"



Digital beauty & role models



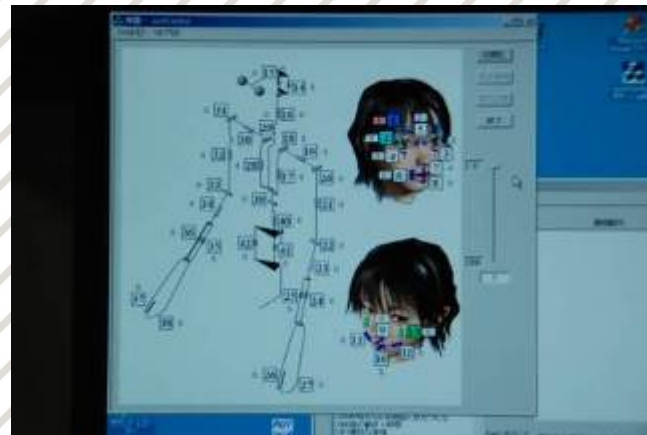
Digital emotions



Ishiguro's daughter



Repliee Q2



Digital worlds and wars: Can military robots follow the Geneva Convention?

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Second Life



America's Army

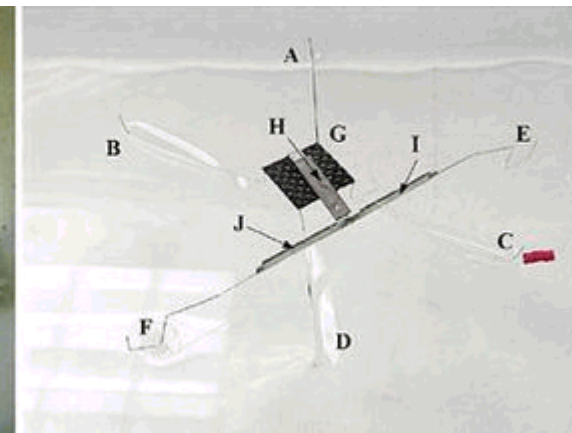


Sim Afghanistan



Ronald Arkin

Robotic animals

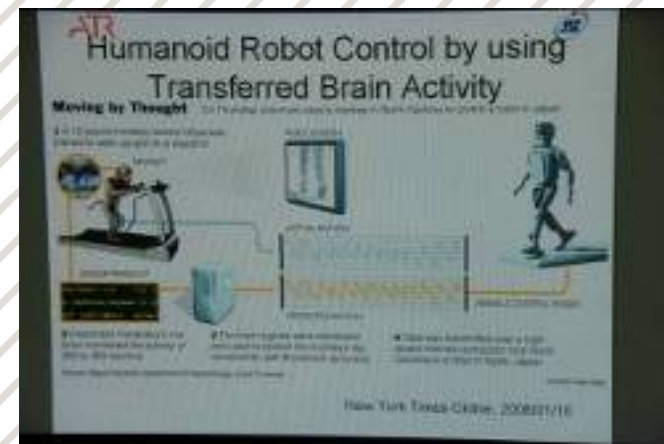
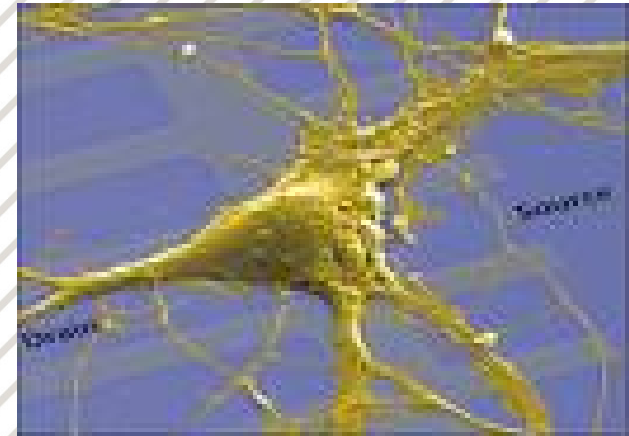


Big Dog (Boston Dynamics / DARPA)

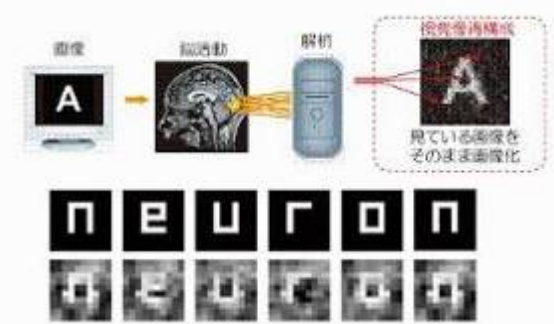
Cyborg animals

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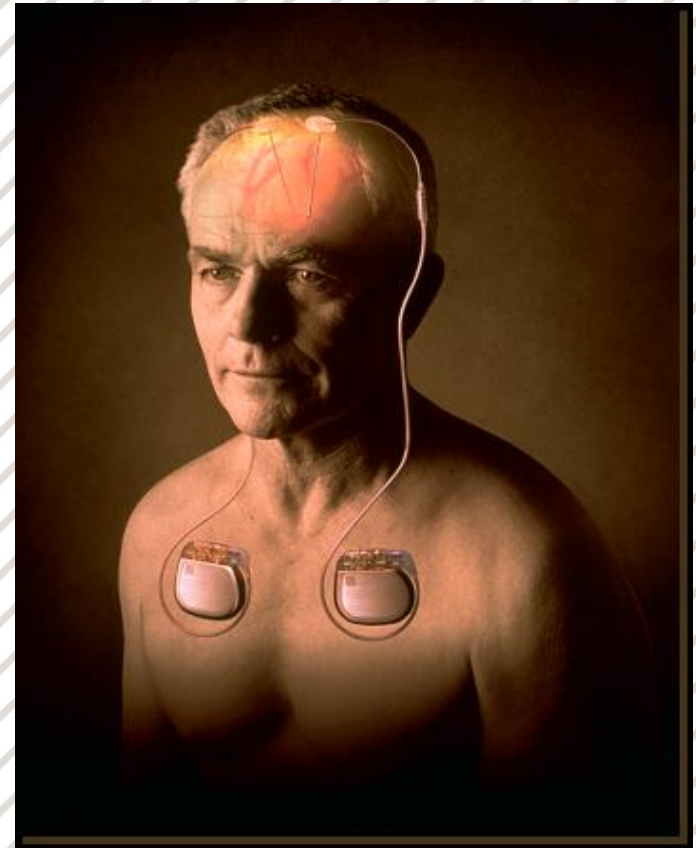
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Cyborg humans



**Claudia Mitchell
first "bionic
woman"
(9-2006)**



“Humans may be able to mutate into supermen in the near future.”
Professor Yoshiyuki Sankai (Tsukuba University, Japan)

Biopolitics - Some issues of the living machine age

- Human enhancement and human dignity
- Privacy and cognitive liberty
- Allocation of control / Ethics of machine decisions
- Safety issues: green goo & robotics
- Integrity of living organisms, e.g. animal rights
- Commercialisation and exploitation of the living world
- To what extent can we learn from environmentalism or eco-politics?
- Do we need a sustainability concept related to our use and manipulation of living organisms, including our bodies and our minds?

