



INSTITUTE OF
TECHNOLOGY
ASSESSMENT

Problematizing New Technology

How to Make Sense of Synthetic Biology

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How to deal with an emerging technology ...

... of which we do not know much ...?

- **What is it like?**

What is it about: 'technoscience' or products?

How can we make sense of what the scientists say?

- **What do we get, and what do we have to pay?**

Is it useful? fascinating? dangerous? morally acceptable?

What are legitimate arguments?

- **How to deal with it?**

Should experts, stakeholders, lay people have a say?

Which options for governance?

A way out?

“Negative side effects can be identified very early on; a prospective knowledge and an early anticipation of unintended consequences are feasible. Many present day and future technologies are based on predecessor technology or a synergetic combination of already-established technologies: we can know much already within the research process.”

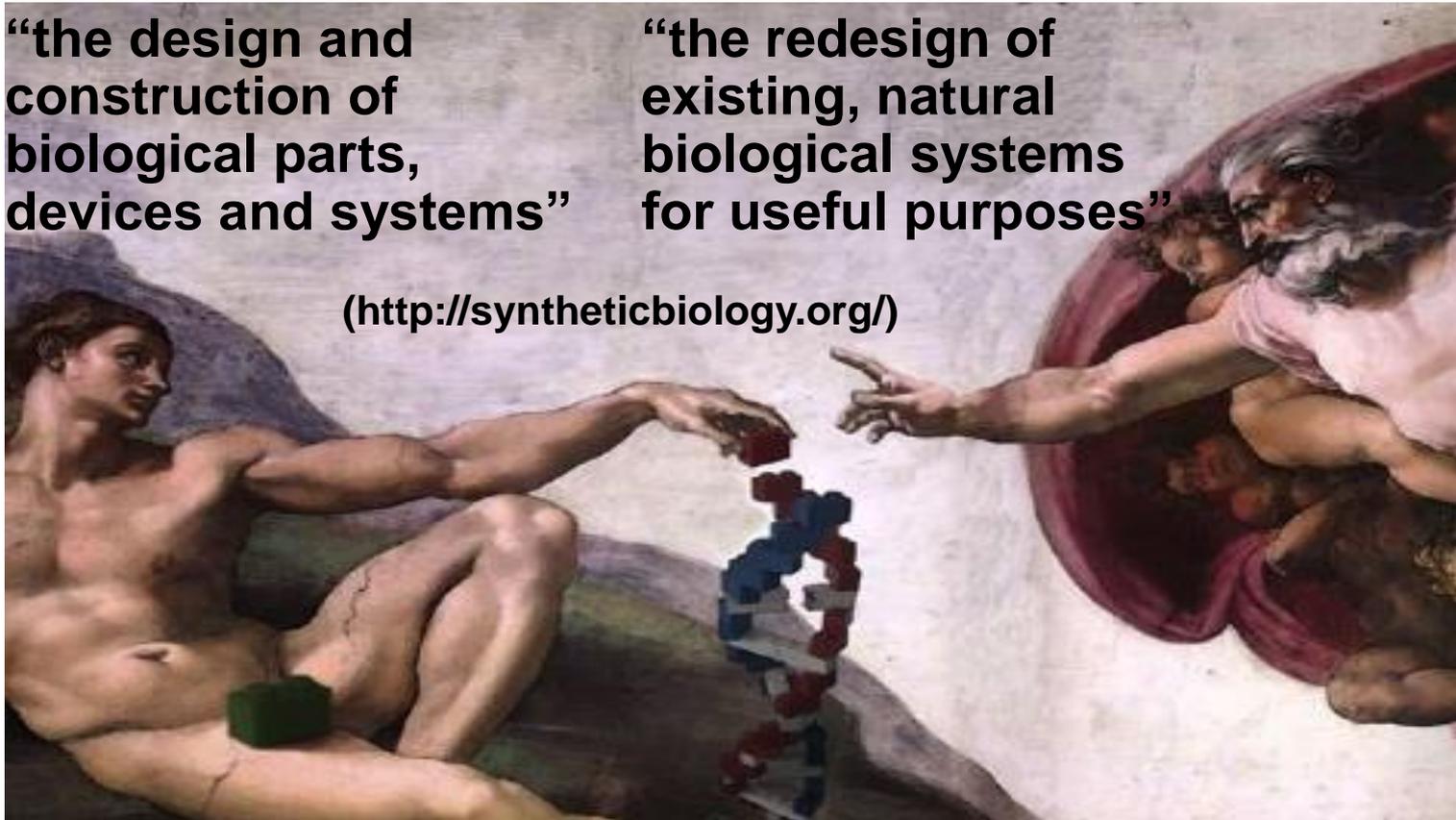
From: Wolfgang Liebert / Jan C. Schmidt 2015, p.2

For example: Synthetic Biology

“the design and construction of biological parts, devices and systems”

“the redesign of existing, natural biological systems for useful purposes”

(<http://syntheticbiology.org/>)



ETC Group
Ottawa (2007)

Extreme Genetic
Engineering

Ist it like ...

- ... biotechnology →
- ... nanotechnology →
- ... information technology →
- „extreme genetic engineering“
- “engineering the molecules of life”
- “DNA as an information carrier”

Comparisons with known technologies suggest perspectives derived from previous debates ...

Biotechnology: conflict, “must never happen again”

- risk debates, contested benefits, expert disputes
- public: to be mobilised / demobilised

Nanotechnology: ‘responsible’ research and innovation

- upstream engagement, generating trust, benefits exceeding risks
- public: to be involved

Information technology: pervasive engineering

- gadgets, DiY, open source
- public: to be fascinated, play, consume

... influencing how the new technology will be dealt with.

Problematization: implicit agreement over what is at stake

To problematize means to

- confine the issues to be taken notice of
- provide basic terms for the debate
- select arguments deemed relevant and legitimate
- determine how a technology gets endorsed or rejected
- determine which expertise is considered relevant.

A dominant problematization enables participants in a debate to argue on a common ground

Problematizing Synthetic Biology

Conventional	Perspectives	Main comparator
Risk	Accidents Deliberate misuse	GM crops/food GM bioweapons
Ethics	‘Playing God’	Cloning, stem cells
Economy	Industrial applicability Open source	Nanotechnology Information technology
Nonconventional		
“Coolness”	Play, design, hands- on	Information technology

Problematizations have implications for policy advice, for example

	Risk Governance	Ethics Governance
relevant expertise	natural sciences	natural/social sciences humanities, religion lay knowledge
institutionalisation	risk research assessment panels agencies	ethics committees
relevant input	research	deliberation
expertise expected	objective	balanced

Speculative analogies to past debates raise questions ...

- Will future technologies be discussed similar to past ones?
- Will a default problematization lead to a “frame mismatch”?
- Is there a “right” way to discuss a technology?
- Who determines how to problematize?
- Is deliberate determination possible in a public debate?
- Is it avoidable when fostering a debate?
- Can a certain problematization prevent controversies?
- Should we avoid technology controversies?

Thank you for your attention!

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Reference

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