1 Two types of technology?

Synthetic biology is the crystallization point of late-modern technoscientific hypes and hopes. In 2010 the research entrepreneur Craig Venter announced the forthcoming advent of an epochal break and envisioned a fundamental shift in our technical capabilities. Synthetic organisms “are going to potentially create a new industrial revolution if we can really get cells to do the production we want; [...] they could help wean us off of oil, and reverse some of the damage to the environment like capturing back carbon dioxide” (Venter 2010).

In order to analyze whether the epochal break claims are justified, I will coin a provisionary search term and call the (possible) novel kind of technology “late-modern” (Schmidt 2012a; Schmidt 2012b). Apparently, this new type of technology seems to be inherently linked to the concept of self-organization. If such a self-organization based technology is emerging, we have to clarify what is meant by the catchword ‘self-organization’, and we need to analyze the source or root of self-organization, including the idea(l) of self-productiveness. The thesis is: instabilities — or, in cognate terms, sensitivities — constitute the necessary condition and, hence, the technoscientific core of this type of technology. Based on such analysis, I argue that late-modern technology differs from the classic-modern type of technology in its view and valuation of stability and instability. In fact, this novel kind of technology appears as nature and behaves like nature. In other words, we are experiencing a ‘naturalization of technology’ in a twofold way, as will be shown in this article. My aim here is to disclose a possible new ambivalence and dialectic of this envisioned late-modern turn in technology for our (late-modern) societies.

1 Venter’s visionary claim was evidently induced by the success of his team in the Creation of a Bacterial Cell Controlled by a Chemically Synthesized Genome—as his article in Science Magazine was titled (Gibson et al. 2010).
2 Clarifying the umbrella term ‘synthetic biology’

The exact meaning of the umbrella term ‘synthetic biology’ is not clear at all. New labels and trendy watchwords generally play a key role in the construction of new technoscientific waves. ‘Synthetic biology’ is, indeed, an extremely successful buzzword, as was ‘nanotechnology’ more than one decade ago.2

All ethicists and technology assessment scholars are aware of the fact that labels are strongly normative. Labels are not innocent or harmless: they carry content and form the backbones of visions. They are roadmaps towards the future and can quickly turn into reality; they shape the technoscientific field and determine our thinking, perception, and judgment. Labels help to foster hopes and hypes, as well as concerns and fears; their implicit power to create or close new research trajectories and development roadmaps can hardly be overestimated. Labels are part of what could be described as ‘term politics’ that regulate and shape the field with a ‘gate keeper function’ to decide who is in and who is out, in particular, whose research field can be considered as ‘synthetic biology’ and whose is just part of traditional biotechnology. Labels are relevant with respect to funding, publication opportunities, reputation, and career. Thus, they determine and sway our future, in one way or another. What does the umbrella term ‘synthetic biology’ mean? Is there a unifying arc and common denominator? What visions do synthetic biologists have, and how likely will their visions be achieved? Three popular definitions of ‘synthetic biology’, and of what it should be, stand out.

First – goals: The engineering definition frames synthetic biology as being radically new since it is said to bring an engineering approach to the scientific discipline of biology. Such an understanding is advocated by a High Level Expert Group of the European Commission: “Synthetic biology is the engineering of biology: the synthesis of complex, biologically based (or inspired) systems […]. This engineering perspective may be applied at all levels of the hierarchy of biological structures […]. In essence, synthetic biology will enable the design of ‘biological systems’ in a rational and systematic way” (European Commission 2005, p.5). This comes close to the definition given by Pühler et al. who define synthetic biology as “the birth of a new engineering science” (Pühler et al. 2011). Similarly, others view synthetic

On the one hand, ‘synthetic biology’ seems to be a fairly young term. It was (re-)introduced and presented by Eric Kool in 2000 at the annual meeting of the American Chemical Society. Since then, the term has gone on to enjoy a remarkable career and general circulation in the scientific communities as well as in science, technology, and innovation politics. On the other hand, the notion of ‘synthetic biology’ emerged about 100 years ago—although it was rarely mentioned until 2000. It seems more appropriate to consider the more recent understandings of ‘synthetic biology’.

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