10.6094/behemoth.2020.13.1.1031

BEHEMOTH A Journal on Civilisation
2020 Volume 13 Issue No. 1

Editorial: The Politics of Techno-Futures

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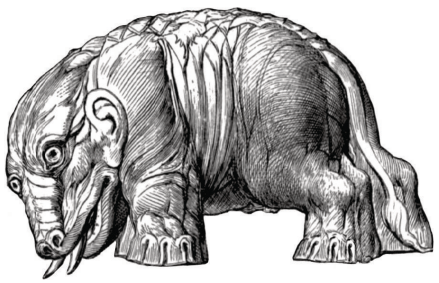
Against the backdrop of worldwide economic crises (first the 'financial', now the 'corona crisis'), proclamations of future technological developments became an important discursive device of statesmanship. In the US, the 'Advanced Manufacturing Partnership 2.0' initiative has been announced. The equivalent in Great Britain is called 'Catapult High Value Manufacturing', in Japan it is the 'Industrial Value Chain Initiative', China launched the 'Made in China 2025' program and Germany proclaimed the 'Industrie 4.0'. In the wake of the corona crisis, the primacy of digitalization programs has been put forward again, together with an emphasis on the importance of medical industries for national competitiveness (Altmaier et al. 2020). All these projects seem to be examples for a state politics in the mode of an announcement of technological visions, aimed at coordinating heterogeneous actors towards national priorities (cf. Meyer 2019).

These techno-futures rising as a tool for economic interventionism seem to share a few common features, namely (1) the promise of national competitiveness by means of 'technological sovereignty'; (2) their proclamation that there is no alternative and (3) that economic and political actors have to put aside their differences and work together for the vision to become true. They seem to generate a normative pressure on a wide scope of heterogeneous social actors, for instance trade unions and companies, and help in the coordination of innovation practices that promise to increase national competitiveness (Fuchs 2018; Pfeiffer 2017).

Since these techno-futures threaten to shape social conditions in the years to come, or at least are set out to do so, we invited contributions that explore how techno-futures are designed and used as part of (state) politics, especially in innovation- and economic policy, for this special issue. We were particularly interested in contributions that connect the rise of techno-futures to an analysis of political economies both at a national and a global level. Through this focus, we hope to contribute to a better understanding of futures as a tool of (state) politics and to provide insights into the apparent resurgence of interventionist state politics, as symbolized for instance by the protectionism of the Trump administration and the 'new national industrial policy' presented by Germany's Federal Ministry for Economic Affairs. Focusing on the active role played by nation states in the design and proliferation of techno-futures furthermore helps to draw attention to the oftentimes



neglected and underestimated role of the state in innovation (cf. Mazzucato 2011).

The contributions draw on a lively debate that has emerged within the social sciences on the importance of techno-futures – that is normative imaginations of future states of affairs that revolve around technologies. In an early contribution, Dierkes and others (1996) coined the concept of 'Leitbild' or 'vision' emphasizing its guiding function. As a collective projection, it brings together the knowledge and intuitions of different people about what seems technologically possible and desirable to them. In this, it partly replaces a binding regulatory system for dealing with future technology in communication between representatives of different cultures of knowledge. Thus, the vision always describes a future technology, something not yet existing. At the same time, however, Dierkes and others point out that the *Leitbild* has a tangible function in material technology development. This perspective has been further developed by, among others, Pattrick McCray (2013), who uses the term 'visioneers', a fusion of visionary and engineer, to show how technology developers are spreading their vision of future technologies, paving the way for their implementation. It has also been supplemented by extensive analyses of the central role of expectations that may condensate in the form of techno-futures, in enabling and orienting processes of innovation (Brown et al. 2000; Borup et al. 2006; van Lente/Rip 1998). Building on these pioneers, a burgeoning research debate developed, focusing on the (hidden) normative and societal dimensions (Grunwald 2016; Urry 2016) as well as their function and effects (Sand/Schneider 2017; Dickel/Schrape 2017; Lösch et al. 2019).

Focused on a national level, Sheila Jasanoff and Sang-Hyun Kim highlighted the significance of techno-futures, coining the concept of 'sociotechnical imaginaries' as "collectively imagined forms of social life and social order reflected in the design and fulfillment of nation-specific scientific and/or technological projects" (Jasanoff/Kim 2009, 120). While the concept of the technological *Leitbild* focuses on concrete technology and its developers, the concept of *imaginaries* starts on a far more abstract level: It deals with the (re-)production of social order on the scale of entire nation states. As recent research has shown, techno-futures do not only quasi-spontaneously emerge out of processes of socio-technical innovation. Rather, they have been identified as tools to shape and orient innovations of socio-technical innovation deemed desirable (cf. Pfeiffer 2017). It is this political perspective on techno-futures that connects the contributions assembled here.

In the first article of this special issue, Jochum analyses the digital and the socio-ecological transformation towards sustainable development as two key issues currently dominating the discourse on the future. Both topics are becoming increasingly linked, but there is no consensus on the direction of the upcoming socio-eco-technological transformation. Jochum argues that the controversies and the different concepts are influenced by the utopian traditions of modernity. In particular, the technical utopia 'Nova Atlantis' by Francis Bacon, and the paradigmatic social utopia 'Utopia' by Thomas More are important. He sees the hegemonic technology-oriented sustainability concepts in the tradition of Bacon. Approaches in the tradition of social utopia, however, may be more likely to solve the crisis, as they include more comprehensive socio-eco-technical imaginaries of a sustainable future.

Staab and Pietron in their paper examine national strategies and investment programs to promote artificial intelligence in the United States, China and Germany. In these programs, they argue, states reinvent themselves as initiators and managers of socio-technological change and therefore develop more interventionist models in the context of industrial policy. They observe a convergence in a regulation model centered on a Decentralized Development State that, however, is being developed within the framework of specific national path dependencies. The authors frame this as a functional connection between socio-technical visions of the future and attempts at political legitimation.

Kalbermatter, Truffer and Nachtwey discuss solutionism as a legitimation of the economic actions of pioneering actors in the Swiss digital economy. They propose an analytical framework that focuses on the actor's perspective and its negotiations within the context of the nation-state. Building on the example of two large companies in the mobility sector, they argue that a Swiss adaptation of solutionism can be identified, which differs according to whether the company is state-affiliated or an international firm. In this, the traditional state-affiliated company represents a solutionism oriented towards the nation-state and the transnational enterprise is oriented towards a global solutionism, which, however, relativizes its peculiar anti-regulationism in the context of the Swiss economy.

Hälterlein discusses the program ‘Artificial Intelligence made in Germany’ and its future vision with regard to the understanding of contemporary security culture. In this, he brings together three hitherto unrelated research strands: the concept of securitization (1), research on AI-based forms of knowledge production in the context of catastrophic future scenarios and possibilistic risks (2), and research on the effects of future visions on research and development (3). On this basis, he shows how the socio-technical vision of the future can be seen as a central element in the co-production of AI-based security technologies and AI-based security. Thus, securitisation becomes tangible as a process that takes place even before the use of technologies by security actors in research and development.

Thaa analyses techno-futures as collective orientations of tech developers on a micro-level. In two group discussions, she explores the respondents’ understanding of society, of technology’s role in it and visions of the future. Thereby she brings together the sociology of future imaginaries or utopias and the sociology of critique. As future imaginaries, the orientations reveal the respondents’ interpretations of society and technology’s role in shaping the future that might orient their actions. The orientations and techno-futures, she argues, also contain normative judgement on capitalism and technology’s role in it. In contrast to a Solutionist polis legitimising the Silicon Valley model of disruptive innovation, the respondents demand democratic and social control of technological development. Yet, this is only applied to the sphere of the application of technologies, while images of an independent technological sphere dominate the discussion about the production of technologies. Thaa therefore concludes that the groups’ orientations indicate a technologized vision of the future, in which society has a rather reactive role vis-à-vis technological changes.

Wentland asks why e-mobility has not promoted the more radical technological future that it initially promised. Based on the approach of sociotech-

nical imaginaries, he addresses questions about change and persistence symmetrically. Building on this notion, this contribution empirically examines electric mobility as it has been propagated in Germany since 2009, and shows how even extensively problematised structures persist, not in spite of, but because of ubiquitous high-tech utopias that seem to challenge them. It examines how a potentially open mobility future and the automotive present are co-produced through a depoliticization of the future, stabilization of imagined forms of life, and continuation of national self-perceptions.

Lösch and Hausstein discuss the roles of politicized futures and their clashes in the context of political economies as well as their impact on pressing societal transformation. Building on the vision assessment concept, they suggest modifications of this analytical framework to make it suitable for understanding visions of future as formative elements in societal transformations. Visions are discussed as hindering or fostering forces of transformations in current capitalist political economies. In this, the article combines insights on the constitutive role of futures in society from the Science and Technology Studies and Technology Assessment with the sociological theory of fictional expectations in the capitalist political economy.

In the last article, Frey and Schaupp examine the political function of state-sponsored proclamations of future technological developments with regard to the case of 'Industrie 4.0'. Building on a comparison of two classical texts of the literary genre of utopianism, Bacon's 'Nova Atlantis' and Morus' 'Utopia', they argue that the future visions of 'Industrie 4.0' can be understood as a techno-political utopia. As such, it is a discursive strategy consisting of three elements: social mobilization for national competitiveness (nationalism) towards a profitable industry with 'men at the centre' (solutionism) and without industrial conflicts (corporatism). These elements limit an open political discussion on desirable digital futures. In conclusion, they show how critical social sciences could contribute to open the discourse from a mere techno-managerial towards a techno-political utopia.

Together, these contributions substantially expand upon existing research, offering a variety of approaches to the subject of (state) politics in the mode of an announcement of technological visions. They provide evidence on how techno-futures enable the stabilization and orientation of national regimes of innovation, how techno-futures have been utilized in global competition and how they shape national as well as international discourses. From the consciousness of tech developers to international policy discourses, the significance of techno-futures is investigated – showing how existing hegemony is stabilized. At the same time, several contributions pose the question how the dominance of allegedly anti-political techno-futures and the normative programs forwarded by them might be contested. Following an anti-technocratic impetus, they challenge us to disclose and deconstruct the oftentimes implicit anticipatory assumptions and normative content of socio-technical futures to enable democratic debates on the ends of technology progress, thereby contributing to the development of alternative futures. Such future visions might also play an important role in the mobilization of social movements, possibly shedding light on novel forms of social and political struggle that are emerging. The development of alternative (techno-)futures has therefore to be understood as a key component of any anti-hegemonic struggle (cf. Srnicek/Williams 2015). Moving beyond self-referential

critique might contribute to both theoretically transcend the dominant framework of capitalist competition and modernity, as well as to break out of our historical situation characterized by escalating economic conflicts, increasing social polarization and deepening ecological crises. We hope this special issue contributes to the formation of such a transformative discourse.

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