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Enemies of the future?

Questioning the regimes of promising in emerging science and technology

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Abstract

This editorial introduces the basic idea and content of the special section “Enemies of the future? Questioning the regimes of promising in emerging science and technology”. It sheds light on how visions and stories of technological futures are being produced and, in combination, have stabilized into ‘regimes of promising’ that shape emerging technoscientific domains and guide research, innovation and governance within these domains. The special section zooms in to particular illustrative instances that reveal the dynamics of the dominant regime of promising and also reveal how they are breaking down, and in some cases being replaced by alternatives. The purpose of this special section is to show the importance of regimes of promising for research and innovation policy and to stimulate further discussions on alternative regimes of promising and their ramifications.

Key words: promises; futures; regimes of promising; emerging science and technologies; innovation policy; mission-oriented policy

Introduction

Promises, future visions, expectations and imaginaries are not merely accompanying, they are also shaping modern science and technology. They support scientific enthusiasm and stimulate competition, raise financial resources, and orient research funds (Van Lente 2012). It has been argued that emerging science and technological fields rely heavily on the production and circulation of promises (Borup et al. 2006, Pollock and Williams 2010). As a result, future visions and promises about emerging science and technologies such as nano-, bio-, info- and cognitive (NBIC) technologies, personalised medicine and synthetic biology, have been increasingly forged and brought to public attention (Robinson 2015, OECD 2014). A large flux of visions and stories of technological futures are being produced, are circulating and, together, these efforts and concomitant interdependencies have stabilized into ‘regimes of promising’ that provide rules and mechanisms in current technoscientific domains – how futures are being produced and how they are mobilised to shape the present.

More than visions or imaginaries, which highlight the content of potential futures, techno-scientific promises establish a relationship between the future and the present (Joly 2010, Audétat et al. 2015). Promises can be mobilised to construct “horizons of hope” that fuel and forge the expectations of diverse technoscientific actors. In turn, such expectations shape agenda setting and action; as a result, promises can create requirements to be fulfilled by technoscientific actors and other corners of society (Parandian and Rip 2012, Robinson, Le Masson and Weil 2012). Importantly, technoscientific promises are relational. As a rule, technoscientists promise better futures to diverse audiences (venture capital, stakeholders, policy makers, the wider publics) who are supposed to act upon them. In some cases, they genuinely act as “promise entrepreneurs”. Elon Musk is a prominent example of a promise entrepreneur (Tutton 2020).

Over the past five decades, the phenomenon of technoscientific promising has become systematised and embedded in the governance of new and emerging science and technologies. In other words, a *regime* of

technoscientific promising has emerged. Understanding the *regime(s) of technoscientific promising*¹ is important for public policy. Speculative bubbles associated to hype/hope/disappointment may generate instabilities, for instance, and one may fear that current challenge-driven research and innovation policy will generate distrust and a crisis of legitimacy of research – particularly when research and innovation are presented as the only way to achieve “grand societal challenges”.

Moreover, regimes of technoscientific promising are no longer just a feature of “applied” or “strategic” technoscience, they have come to dominate the whole system of research since the start of big national programs on biotechnology, nanotechnology and brain research and the growing importance of project funding for the support of science. Moreover, the trend in new public management of research places as a requirement that researchers and research organisations must demonstrate how their research will impact society in a beneficial way – hype and hope are being institutionalised, requiring a counterbalance of controlled speculation through a variety of anticipation and reflexivity support systems (Joly et al. 2019).

Likewise, regimes of promising are challenged by other ways to articulate research with societal expectations, like the slow science movement (Alleva 2006), participatory research and community-based research, frugal innovation (Pisoni et al. 2018) and citizen-driven co-creation (Robinson et al. 2021) and calls for “Responsible Stagnation” (de Saille & Medvecky 2016).

In this special section, four articles that critically examine the dominant regime of technoscientific promising are brought together to highlight the limits of the dominant regime of technoscientific promising and to shed light on what could be called alternative regimes of technoscientific promising.

Four contributions

Gaia Barazzetti and colleagues observe that at the end of the race to map the human genome, a new cycle of technoscientific promising is being geared towards the prospect of personalized medicine. Drawing on the increasing speed of DNA sequencing at decreasing costs, personal medicine has gained attention in many countries keen to support biomedical research like Switzerland. The article shows that, while competing to obtain public support for large research infrastructures with ambitious discourse of preventing and curing diseases, the overall promise of personalized medicine is actually being reformulated by stakeholders. Using the concept of “ethical boundary work”, Barazzetti et al. focus on the negotiation between promoters, researchers, clinicians, the authorities and public health actors, concerning the uncertainties emerging around the promise of personalized medicine. Challenged to be explicit about whom personalized medicine is going to benefit, and also challenged to define and clearly articulate the responsibilities and warrants which need to be established for biobanking, the promise is renamed “personalized health” in order to satisfy ethical and governance principles, and to gain legitimation by patients and citizens. The prospect of personalised health sustains a stable network of stakeholders and clears the way to larger projects of funding at the national level. As a consequence, a new cycle of promise and requirements is in play, bound to (and conditioned by) the Swiss context, displaying a distinct regime of technoscientific promising - shaped by the local and national circumstances.

Matthias Wienroth explores the regime of technoscientific promising concerning genome editing for human health, in the United Kingdom context. Focusing on the emergence and governance of genome-editing and how the regime drives and shapes the articulation of public goods and their beneficiaries, Wienroth offers a critique on how specific publics are created, leading to a specific lock in, and lock out, of a variety of publics and the associated norms and values. This, Wienroth argues, has led to a restricted articulation of the “moral futures”, associated with genome-editing and amplified through the regime of promising, leading to potential challenges for the anticipatory governance of genome editing in the United Kingdom.

¹ Whilst we argue that a dominant regime of technoscientific promising has emerged over the past five decades, as you will read in this special section, alternative regimes of technoscientific promising are emerging, therefore we use regimes in the plural.

In general, regimes of promising structure the ways societies connect to the future. The paper by **Pierre-Benoit Joly and Claire Le Renard** investigates this phenomenon in-depth by historicizing the societal relationship to the future. They draw on the concept of “regime of historicity”, defined as an organizational structure that is imposed on the societal experience of time and which is mobilized to articulate the present, the past and the future. Following this line, Joly and Le Renard suggest that, so to say, the nature of “future” has changed. In what they call a *presentist* regime, the future is much more fragile and problematic than in the *modernist* regime which prevailed until the 1990s.

Drawing from four case studies, Joly and Le Renard argue that the way techno-scientific promises align with regimes of historicity is crucial, showing that promising in the *presentist* regime using the modernist frame of innovation (creative destruction) raises many problems. When the future is fragile, while confidence in technological progress has faded away on the grounds of many controversies about their social and environmental consequences, the foundations of promises can no longer be the same. Instead, they argue, that the building of “horizons of hope” may rest on processes of collective experimentation, and thus, an alternative regime of technoscientific promising.

The contribution of **Ferretti and Van Lente** delves deep into the promises of science and technology to include citizens in its developments, to achieve a better alignment between science and society. In the last decade, the dominant regime of techoscientific promising has increasingly included values and norms linked to democracy and representation. In policy circles, for instance, Ferretti and Van Lente argue that the hope is that ‘citizen science’ and its various guises will help to connect science and society better and that this will sustain the legitimacy and efficacy of public investments in science and technology. In other settings, such as in hacker communities, alternative notions of citizen engagement with science and technology prevail, creating a strong contrast to the dominant regime of technoscientific promising.

Focusing on the Maker Movement, Ferretti and Van Lente map the rise across Europe of citizen engagement, studying the practices, aspirations, values and motivations of the participants. A key theme of the paper is the apparent contrast between policy expectations of the Maker Movement and the expectations of the Maker Movement itself. While EU Policy documents frame the rise of the Maker Movement as supporting the promise that including citizens will reinforce the development and uptake of public science and technology, the Maker Movement, on the other hand, stresses that it is much more than just including citizens in science and technology. Other motivations and drivers, such as fun through technology development and curiosity, for instance, are highly valued and seen as missing in established science and technology. The promise of the Maker Movement, thus, can be read as a criticism of mainstream science and innovation systems, instead of a support of policies to further include citizens. In this way, the contribution of Ferretti and Van Lente provides insights into what might be seen as an alternative regime of promising regarding the development and deployment of new and emerging technologies – a regime not operating as a monolithic force but being shaped by ongoing contestations and reinforcements from a variety of innovating stakeholders.

Discussion and outlook

The thesis of the existence of a dominant regime of technoscientific promising refers to the intensification and systematisation of the use of expectations, visions and hype to govern technical research and development over the past five decades. The regime of technoscientific promising as a key driver for mobilising resources and driving technology development has come about through a tri-partite move of (a) the future being more of a threat than a hope for humanity (Innerarity 2012), (b) research and technology development appearing as the solution to making the future a safer place and (c) the increasing pressure to show how public investments into new science and technologies will lead to desirable societal impacts (Joly et al 2019). All four contributions in this special section reveal that this dominant regime of

technoscientific promising still remains very visible today, but that it is evolving and, in some cases, breaking down.

Presently we are witnessing a shift towards challenge-oriented policies for research and innovation. Sustainable Development Goals and mission-oriented policies (Mazzucato 2018) are shifting the perspective from what technologies can promise towards what society actually needs. Eventually, this “directionality turn” may require new regimes of promising, such as the “regime of collective experimentation” as argued by Joly and Le Renard, or the promises of the hacker culture, as studied by Ferretti and Van Lente. Yet, there is a danger also that the directionality turn may lead to repackaging the business-as-usual activities of new and emerging science and technologies, thus reinforcing the current regime of technoscientific promising – bigger promises for bigger goals. In this way, the dominant regime would block novel engagements and creative new paths – and thus appear as an ‘enemy of the future’. This unfortunate possibility is already visible in the promotion of research and innovation to tackle challenges such as climate change. Here, an emphasis is placed on the role of new and emerging technologies in the transitions from present situations, such as pesticide-based agriculture or fossil fuel heavy energy systems, towards greener situations, such as agroecology approaches to agriculture and clean energy. What is receiving less attention in this discourse, and also in green transition policies, are the painful effects of destabilising the incumbent situation, for example in agriculture and energy supply and use. The need to discontinue existing systems is not included in the narratives bandied about through the regime of technoscientific promising.

The persistence of the current regime of promising and the emergence of alternatives creates both a challenge and an opportunity for policy: the large promising surrounding new and emerging technologies should be balanced with the support for alternatives regimes of promising, such as collective experimentation and distributed science and innovation. Also, the current moves by public agencies such as the European Commission to focus on missions might be a step in this direction.

With Stengers (2017), Joly and Le Renard argue for building “a horizon of hope”, that recognises that the future is fragile but emphasises that it can be both contested and co-constructed. In this special section we show that in a post-progress society, where societal grand challenges are recognised as important, there are indeed attempts to reimagine the relationship of new and emerging technologies with the future. We argue that questioning the regimes of technoscientific promising is needed, to avoid that they turn into enemies of the future.

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