Benoît Godin and Dominique Vinck (eds) (2017) Critical Studies of Innovation: Alternative Approaches to the Pro-Innovation Bias. Cheltenham, UK: Edward Elgar Publishing. 335 pages. ISBN: 978 1 78536 696 3

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Traditional studies of innovation focus on the creative, and the priority aspects of innovation (being first with something new) and emphasise that innovation is 'good'. The book under review here presents studies of literatures and phenomena that are left out of the dominant innovation discourse. *Critical Studies of Innovation* makes an important contribution in the way it illuminates what is missing from how we imagine and talk about innovation. Specifically, at the centre of the book is a willingness to bring to light the 'dark side' of innovation, so that a generative critique in which we learn how to 'metabolise' this dark side becomes possible. In reviewing the book's approach, I nonetheless find that the book neglects an important topic.

By metabolising, I mean something like the following. According to the mainstream model, success is clearly separated from failure, and creativity clearly separated from maintenance. According to the analysis proposed in this book however, success becomes inclusive of failure and failure part of success. And so too for creativity and maintenance. The effect is of an expansion of actor networks, a re-accounting of the work (energy) involved, and a re-assessment of the benefits (or lack thereof). The 'dark side' of innovation refers to what is left out of the pro-innovation bias. For example, a withdrawal of a product is considered as solely consequence of some inadequacy. Thus withdrawals (failures) are neglected by mainstream scholars. Yet, the translation model presented here, helps identify that a withdrawal of something is in an odd way, the very purpose of an innovation. Thus, metabolising the dark side of withdrawals is to identify a different sociotechnical network of actors with different purposes.

Humans are always grappling with complex global challenges. If the way that innovation is studied and understood is limiting energy for change, restricting rewards for change, or ignoring particular consequential aspects of innovation, then that concerns and interests me. Read widely the book could help cultivate a wave of thinking differently about innovation. Required reading for students of science and non-science courses in later years perhaps? The book will appeal to teachers and researchers looking for ideas to expand their topics of discussion, and to practitioners and professionals who are looking for possibilities to fashion interventions for change.

The chapters are arranged according to a four-part argument between an introduction and conclusion. The four-part argument works well as each chapter basically repeats the book's main claim that something is missing from innovation. However, it is not the argument itself that helps in surfacing the feeling at the centre of the book. More likely it is the cumulative effect of different situations re-viewed and re-assessed through different frames with different criteria for attributing success. I enjoyed reading all the chapters.

The four chapters of Part I identify problematic aspects of mainstream innovation frameworks and narratives. Right from the start the meaning of innovation is unsettled. The four studies identify: that, seen historically, the meaning of innovation has changed dramatically over centuries and a particularly narrow meaning is current; important elements like organisation is excluded and so too the implications; the unintended consequences of adopting innovation best practice is imitation, but imitation is neglected by mainstream innovation study, and; excluding the socio-political roles of the state other than the funder-facilitator role leaves the socio-political implications of innovations unexamined. For example, innovation did not always carry the meaning of 'good'. The Reformation is a key moment of change in the meaning of innovation. Innovation began to be used to refer to something 'bad'. Enemies were accused of innovation. Innovation was contrasted to tradition and custom. It indicated contempt, danger and revolution. Insights are that innovation as being 'good' should not be taken for granted, innovation is both a result and a cause of the culture and dominant ideologies of the time, and excluded elements obscure the visibility of important good and bad effects of innovation, including missing cycles of narrowing effects on innovation.

The three chapters of Part II examine examples of neglected aspects of the pro-innovation bias. The studies examine: how actors often deliberately choose strategies to eliminate or reduce something because it is the right thing to do, yet, except in few concepts like responsible innovation, phenomena like withdrawal, de-adoption and destruction are not considered; the dynamic interplay between 'unlawful' innovation and the legal system through a legal grey zone, and; attended and unattended consequences of financial innovation and the obligations to recipients of change (including non-adopters and non-stakeholders) in a more balanced way through a combination of stakeholder and ethical perspectives. Models from STS help to make visible dynamic arrangements and mutual redefinitions of actors and the breaking and rearrangement of their ties and relations. The case studies of chapter 5 demonstrates that 'less' or 'no' is not simply a case of 'simplicity' or 'frugality' and that choices

about withdrawal can come from recognising the risks posed by, for example, pesticides. Other times, choices are driven by critique that undermines or disqualifies certain actors, practices or entities, such as, for example, the chemical or mining industries. The insights show that including neglected aspects through alternative and more inclusive models helps with studying the transformations of society.

In Part III, three chapters offer studies of resistance to innovation. They focus on motivators and enablers of resistance; sociotechnical resistance as a problem-solving (re-innovation) activity involving a range of actors by studying the relation between technology and ideology, and the conditions that lead companies to choose strategies to slow their pace of innovation or to not-innovate. By viewing resistance through a model of pain in self-monitored movement that respond to viral contamination and pestilence, resistance (negative perceptions and pain) becomes integral to the functioning of innovation (chapter 8). More importantly, where innovation and resistance are clearly separated in the mainstream model, with the pain framework, innovation has become (indeed, cannot occur without) resistance, and resistance has become (part of) innovation.

Part IV has five chapters that focus on alternative frameworks and models for studying innovation. The studies describe: viewing innovation as a process of learning including learning from failure rather than seeing failed innovation as a loss or seeing innovation as a process toward success without any failure dynamics or failed outcomes; examining novelty and change dynamics from the industry level shows that the industry is maintained and repaired in a way that keep it functioning in largely the same way; how discourse on innovation includes elements that promote faith and self-serving practices in innovation which reinforces the benefits of innovation and ultimately promotes more faith in innovation; a NOvation model of innovation, and; a biological model of innovation. I particularly enjoyed reading the analysis of innovation in the automotive industry that shows automotive innovation as small and incremental activity against a background of sameness, stability and conservation obtained by standardisation (chapter 13). The

insight is to use frameworks that assist examination of the currents of innovation and also the counter-currents that prevent systemic innovation.

Finally an observation on a topic nearly entirely missing from the book. The contributors demonstrate skill in identifying what is missing from other's work. Yet, neither mainstream innovators nor critical researchers of innovation are free from giving prominence to certain things and excluding and neglecting other phenomena (creating another dark side). Critical scholars of innovation too are subject to the forces of maintenance, failure, non-adoption and withdrawal. I would have liked to see more discussion about the cultivation necessary for a willingness to metabolise the dark side. My point is that illumination/obscuring are iterative. Really significant

innovations would be suggestions on how to keep in view the inevitable 'dark side' of any innovative approach, and how to maintain an appetite for the inevitable othered.

Recognizing and working with undesired qualities requires energy and resources to keep separations in place, repressed and denied. The contributors to this book demonstrate that frameworks and models different from the traditional model of innovation can help to 'metabolise' the dark-side of innovation. Innovation here becomes inclusive of and cannot function without those elements that the traditional model excludes, while the excluded elements become innovation. The effect of innovating with innovating is to find renewed energy for change and to distribute more widely the rewards of innovation.