This book is aimed at educating the mining community, governments, civil society, and university researchers about the importance of creating a responsible mining sector. The research is particularly important for the fields of geology and earth sciences, environmental science, sustainable development, and international business.

This is not a textbook but rather provides a structured and logical basis for researchers and more advanced university students with a reference point for understanding the complex social, environmental and financial factors that are created by and influence extractive industries around the world. Bice provides a nuanced analysis of both the criticisms and accomplishments of the rise of corporate social responsibility (CSR) within the global mining industry while postulating the necessary steps for reducing impacts through improved practices.

This makes the book an important work for educational purposes for those scholars and students of economics, development, climate change and environmentalism, as well as decision-makers in public, private and civil society who influence and are influenced by extractive industries.

For me, a postgraduate researcher, practitioner and educator across climate change, conservation, and sustainable development this book is a very well written and engaging account of the current state of play in the global mining industry and provides a future vision for the sector. Further, as a geologist by training, and having worked within the mining industry during my undergraduate years, I have a strong understanding of the importance of mining, minerals, and geological resources for the prosperity of our society; at the same time I have always been critical of the disastrous impact that mining can have on people and the ecosystems we depend on, and particularly the sector's contribution to global climate change and the resulting social and ecological crises we now face. Thus, Bice's argument that mining can never be sustainable rings true for me; however, because I know people who work in the sector and care about our planet's future at the same time, I do believe that the industry can become more responsible and ethical, and it must if its legitimacy is to be maintained.

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Sustainability and the art of long-term thinking

Bernd Klauer, Reiner Manstetten, Thomas Petersen and Johannes Schiller, Milton Park (Ox): Routledge, 2017

Reviewed by Ian Thomas, RMIT University, Melbourne, Victoria, Australia

https://doi.org/10.1017/aee.2019.22 Published online by Cambridge University Press

Perhaps as suggested in the title, this book is like a good red wine; it improves with time. The point being that engaging with the content, and especially the writing style, takes time. Generally, it is not a book for the reader who wants a simple solution for all our sustainability problems. Towards the middle I was reminded of one of the last scenes in *Monty Python and the Holy Grail*, where 'get on with it' was a key piece of commentary. But my problem was wanting to see how the authors' apparent diversions related to sustainability; then I realised the insights to be gained by understanding the relevance, slowing down my expectations, and taking time.

In the Preface, the authors set the scene with their comment that 'this book addresses the topic of "time", a topic that is seldom placed at the centre of scholarly study' (p. xv). Scholarly study is the emphasis, with the intent of developing an outcome to assist our progress towards sustainability. So, the work has a clear academic basis with what I would call a strong European-style philosophical approach. With this starting point, the authors set out three aims for the book:

> '• at the level of theory ... (develop) a conceptual scheme and a perspective that enables knowledge relating to sustainability ... to be structured clearly ... to identify practical options for ... advisors and policy makers.
>
> • at the empirical level (discuss) real-world case studies in sustainability policy; and
>
> • at a practical level (present) a heuristic that offers decision makers ... a procedural tool for ... exploring sustainability problems ... and making them amenable to sensible solution.' (p. 8)

This broad scope is a brave attempt to make 'on the ground' progress towards sustainability. However, while the individual components of the book make important contributions, the overall outome could be clearer. For a reader, especially one whose focus is curriculum and pedagogy for educational outcomes, a clear integration of the material with an identifiable flow of thinking and analysis would be more effective to provide the reader with a readily available tool.

Beginning with Part 1, Chapter 1, 'Different approaches to sustainability policy', provides a summary of the book, before moving to an overview of 'Sustainability: theory and policy', the second chapter. This overview provides a concise introduction to relevant frameworks, especially for anyone new to 'sustainability education'. The authors make the point that 'sustainability policy is always also environmental policy — environmental policy with an *integrative* and *long-term* perspective' (p. 27). While I am not convinced that those involved in environmental activities would agree they have avoided these perspectives, the authors emphasise the normative aspects of sustainability as: intra- and intergenerational justice; a long-term perspective; a comprehensive and integrated approach; and the preservation of nature.

Part 2, with its six chapters, is where the focus on 'thinking' really begins. Here the authors devote considerable time and words to digging into the substance of the concepts that underlie 'sustainability' and 'long term'. First, the concept of 'stock', as the aspects of resources that are critical for our sustainability (survival), is discussed in terms of: material stocks (e.g., mineral reserves, coffee, rail networks); immaterial stocks (e.g., values, laws, knowledge, habits); and institutions (both formal, which 'oversee' formulated rules, and informal, where rules and guides are unarticulated). This discussion covers 34 pages, so my summary does little justice to the scope and depth of their thinking. 'Persistence of institutions' (Chapter 6, 19 pages) explores the relationship of time to the influences on the ways that social norms, rules and guides either continue or change. Then, the process of 'Judgement' (Chapter 7, 20 pages) is analysed to show the importance of forms of knowledge, institutions and time in making decisions about stocks; here the authors make the observation that 'judgement proceeds heuristically ... guided by general rules ...' (p. 116). 'Time and the practical dimension of the concept of stock' (16 pages) makes the point that 'the concept of stocks (dynamics) brings the temporal dimension of action to the fore' (p. 119), and that we think of time as passing (in uniform moments and spans); 'stocks act as a

https://doi.org/10.1017/aee.2019.22 Published online by Cambridge University Press

heuristic and are a bridging principle for purposes of judgement in relation to time' (p. 127). This leads to the other aspect of time, being the proposal that there is a 'right time' to take some action.

The two chapters of Part 3 provide case studies of how the concepts that have been discussed (stocks, institutions, judgment and time) can be used to analyse policy and activity about German soil and water contamination, and to assess options for achieving sustainable land use in Germany. Coming from this is the broad conclusion that 'the stocks perspective repeatedly draws our attention towards time: it demands that our analysis takes a long-term view when looking into the past as well as into the future' (p. 172). Drawing on this experience, the authors, in the three chapters of Part 4 ('The art of long-term thinking') lay out the framework for the analysis of sustainability issues. Their 'heuristic for sustainability policies' has seven steps:

1. Become aware of, and review, existing knowledge, opinions, insights;
2. Develop ideas for sustainability and frame the problem;
3. Identify relevant stocks;
4. Describe the dynamics of the stocks;
5. Order knowledge of the stocks and their dynamics to integrate into an overall picture;
6. Formulate tangible sustainability objectives;
7. Identify the sustainability problem and what needs to be done.

This heuristic is similar to the process for developing and implementing policy, or actions, found in policy studies and other literature; except that these typically make the implementation (what's done) more prominent, and build in a stage for reflecting on the outcome (i.e., evaluating it).

In essence it feels like a lot of effort has been expended to reach a not especially new understanding of planning for sustainability. Yet the process of reaching this point has highlighted important reminders for all of us engaged in facilitating communities to focus on a sustainable future. First, is to actually think specifically about the range of factors and their interactions affecting the future. Second, is to look to the long term and avoid short-term simplicity. It may seem that we all do that, but following the journey mapped by the authors has the potential of opening up insights into how we (as individuals) and the community generally work through actions that will affect our future.

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https://doi.org/10.1017/aee.2019.22 Published online by Cambridge University Press