ANTARCTIC FUTURES: HUMAN ENGAGEMENT WITH THE ANTARCTIC ENVIRONMENT. Tina Tin, Daniela Liggett, Patrick T. Maher, and Machiel Lamers (editors). 2014. Dordrecht: Springer. xx + 360 p, hardcover, illustrated. ISBN 978-94-007-6581-8. €105,99.

Antarctic futures is debatably a juxtaposition at a time when the Antarctic discourse, never complete without mention of pollution, native species decline, alien species introduction, and climate change, is marred by uncertainty and anxiety. Had the cover tried to dazzle with yet another penguin-studded iceberg bathed in sunlight, I would not have picked it up. Instead, the subtle optimism of 'Human Engagement' against a sober green background swayed me. This polar early-career researcher in industrial archaeology, not without guilt of academic tourism, recognised herself in the title and was curious what the Antarctic would have in store for her future career.

The preface sets the Antarctic scene with continent and ocean remaining some of the most pristine environments that experience relatively few direct environmental impacts compared with other regions. The editors assert that 'more than 50 years after the signing of the 1959 Antarctic Treaty, it is time to take stock and look ahead at the future challenges of Antarctic environmental management as well as to explore what needs to be done to maintain the relatively pristine character of the Antarctic environment' (page vii). Two principal themes initially crystallised out of a session at the IPY Conference in Oslo in 2010; they are '(i) the need for strategic planning in the management of human activities in the Antarctic along with the conservation of terrestrial as well as marine ecosystems; and (ii) the values of Antarctica that merit protection' (page vii–viii). The commendable effort to publish said session culminates in this volume, which sees leaders in environmental management, human impacts, strategic planning, and value not only building on their ongoing work but boldly consider a range of scenarios for the Antarctic in 2060. All are painfully aware, of course, that there is nothing as unpredictable as the future.

The graduate-level contents are topically arranged in four parts, a summary at the end of each. The editors' introduction is followed by Part I's five essentially scientific chapters on 'Species and ecosystems' with special protection status under international agreement. The assertion by Woehler and others that only Japan engages in Antarctic whaling (page 45) stresses that the timeliness of this volume is fast being overtaken by subsequent events: in March 2014, the International Court of Justice banned Japanese scientific whaling (International Court of Justice 2014). Part II provides three 'Regional case studies'. Any progressive lessons learned from Deception Island and McMurdo station stand in contrast with 'the environmental situation in Fildes Peninsula [having] the potential to become a famous negative example of the treatment of the Antarctic environment by humans' (page 186). In fact, in March 2013, *Nature* mercilessly reported that 'researchers put pristine Antarctic peninsula at risk [by] numerous and systematic violations of the Antarctic environmental protocol' (*Nature News* 2013). Environmental non-governmental organisations, governmental institutions involved in supporting science, tourism researchers, and sustainability experts raise their voices in Part III to highlight how 'Actors and sectors' outside scientific stewardship use and value the Antarctic. The allegation by Neufeld and others that 'the dominance of science in Antarctic Treaty forums has led to an evidence-based management paradigm, which has many positive aspects but has led to different values being underplayed' (page 233) ripples through repetitions of 'pristine' like a breath of fresh air. In Part IV, the editors observe that '[all preceding authors] concur that existing environmental management practices and the current system of governance are insufficient [...] let alone address the challenges facing a warmer and busier Antarctic [...]' (page 335). Regarding 2060, I agree that seemingly unattainable 'utopian visions are necessary [...] to strive for what might be, could be and should be' (page 349).

Antarctic futures is an engaging, emotional, and enraging read. Some chapters rile me with priorities and values that do not reflect my own. Only on page 184 do Braun and others clearly state the independent value of 'the Antarctic [being] an important part of the Earth's ecosystem.' A connection with the Millennium Ecosystem Assessment (MA) is made later still. Decades of 'intense public outcry and vigilante action' (page 34) are downplayed, and I ask myself if they did not raise public awareness more successfully than National Antarctic Program (NAP) attempts at societal involvement (strongly recommended by Sánchez and Njaastad on page 305). To be fair, at the time of writing, I became aware of a topical 'Call for community input' into a US National Research Council study to advise the National Science Foundation Science Priorities for Antarctic and Southern Ocean Research. The time-depth of human enterprise in the Antarctic is not fully appreciated, and cultural heritage is merely assigned entertainment value. It is a bone of contention that the challenges faced by material remains are side-lined in the chapters and that historical archaeology is not recognised as a suitable tool with which to carry out the 'targeted research [...] paramount in filling in gaps on baseline information and improving understanding of key ecological relationships' proposed by Pertierra and others (page 207). This suitability has been shown during ongoing research in the Arctic. See, for example, Hacquebord (2001). Food for thought is the question if we intend to eradicate the material legacy of our 'scientific age', which arguably finds archaeological parallels in the 'empty' Dark Ages of European history.

Nonetheless, *Antarctic futures* is a timely assessment on good authority which mostly succeeds in integrating the natural and social sciences in order to examine existing and alternative environmental practices. If legislative details seem repetitive, they only serve to drive the message home. An Antarctic map would have complemented the otherwise few but adequate figures, and the extended bibliographies elevate the volume to reference-work status. Carefully concealed passion underlies the chapters, which bursts to the surface when Woehler and others, for example, exclaim that Antarctic degradation is 'indefensible and unacceptable in light of our current knowledge and our ability to mitigate.' (page 51). Neufeld and others' use of the word 'jealousy' (page 247) did not go unnoticed. Lamers and others rightfully state that 'we have only begun to open Pandora's box on this complex but essential next step in Antarctic environmental governance' (page 322). It remains to

be seen if 'genuine political will' (page 336) is still unattainable in 2060.

Before then, it is a pricy yet ethical first step to place *Antarctic futures* on the compulsory reading lists of all Antarctic scholars and their students – the future leaders in polar science and environmental management. This recommendation also extends to other actors and sectors. There is plenty of scope for a follow-up volume. I would welcome the addition of research on public outcry, vigilante action, and cultural heritage. (Frigga Kruse, Arctic Centre, University of Groningen, PO Box 716, 9700 AS Groningen, The Netherlands (f.kruse@rug.nl)).

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