Sunburnt Country: The History and Future of Climate Change in Australia

Joëlle Gergis, Melbourne University Press, Carlton, Australia, 2018, x +. 310pp, ISBN 978 0 522 87154 8 (paperback), A\$34.99

(Also available as an eBook A\$16.99)

Dorothea MacKellar certainly provided us with a neat and appropriate descriptor of the overall climate of this country, as used in the main title of this book. Interestingly, the poem from which this title is taken, *My Country*, was written for an English audience and first published in the London *Spectator*. The subtitle I am not so sure about. Variability is now, and has been for a very long time, a dominating factor in the climate characteristics of most of Australia and to label it all as climate change with the subtitle “The History and Future of Climate Change in Australia” is a bit misleading. Climate change is certainly shaping up as a highly significant issue for Australia and this point is well covered in the book but the variability that has plagued the European settlers since their arrival is just that, and it will continue along with the changes of the future.

Following the foreword by David Karoly, in which he outlines the interesting origins of the book, it is structured in five Parts that are similar in length to book chapters. These Parts are subdivided into named sections consecutively numbered through the book. There are 41 of them, many quite short. In terms of its rigour and the sound scientific basis of the content, this is an academic book—though the contents are not specifically referenced. All the reference sources are given at the end of the book, just before the index, and are grouped by the five Parts. I was initially surprised by this, but on reflection I think it is an appropriate way to structure the material, given the need to make it available and readable for an audience wider than academic climatologists. Of course, if you want the specific reference for some issue, you will have to search the set for that Part. For anyone wanting to dig deeper in to these matters, the reference lists are a treasure trove.

It is impossible to do justice to the rich coverage of this book in a short review, but I will briefly outline the main contents of each of the five Parts. Part 1, “Colonial Calamities”,

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begins with an account of weather conditions experienced by those who arrived on the first fleet, both on their way to Botany Bay and after arrival, and goes on to discuss the SEARCH Project, which attempted to reconstruct the climate history and its social consequences beginning in 1788. Part 1 also provides an overview of the main drivers of variability in Australia's climate and the floods and droughts of the early colonial period as recorded in documents from the time.

Part 2, "Weather Watchers", is centred on the collection of information and records of climate and climatic events. There is a focus in this Part on climatic extremes of flood and drought, and the point of this focus in the context of the settlers, mainly from the United Kingdom, could perhaps have been made clearer if there was some comparison provided with flood and drought events in the UK. Still, the historical material used here tells a dramatic story. This Part also deals with the establishment of official records of climate variables in the colonies. Given the experiences, as recorded here, of the extremes of flood and drought, it is surprising that the first recording stations did not measure rainfall, but focussed on temperature and atmospheric pressure. This Part concludes with a section entitled "Wisdom of the Elders" and discusses Indigenous views of the climate and its progression through the year. Their nuanced views of climate sequences through the year, and from year to year, related to such things as the behaviour of plants and animals, is a much more appropriate basis for understanding the Australian climates that the four seasons brought from Europe.

Climate reconstructions based on records that extend much further back than the period of European colonisation form the basis of Part 3, "Time Travellers". In this Part the proxies used to estimate climate conditions over much longer periods than can be achieved by observations and historical documents are discussed. These include tree ring data from Australia and New Zealand and the coral reefs. The air trapped in the ice covers of the poles, yields evidence of the changes in CO₂ of the Earth's atmosphere showing the rise that began with the industrial revolution in Europe. This leads on to an arresting warning that there are fears that '...yet another record-breaking summer will trigger instability in the Earth's

thermostat and cause abrupt and dramatic changes to the stability we've enjoyed for thousands of years' (p141). This Part goes on to take the reader through the details of paleoclimates in the southern hemisphere, drawing out the specific characteristics of that hemisphere, concluding with a discussion of the Anthropocene.

Part 4 is entitled "History Repeating" and begins with a discussion of longer-term global climate changes, back into the Pleistocene ice ages, and their relevance to the current climate debates. The bulk of this Part is aimed at showing both how an increase in average temperature is transformed into climate responses, and how those responses will be played out in detail. The sections contained here cover temperature regimes, the occurrence and severity of bushfires, and rainfall and snowfall regimes. For keen skiers there is bad news here. This Part concludes with a section dealing with sea level rise and rightly points out that this is not just an issue of the rise in mean sea level but the effect on coastal locations of the storm surges on top of those levels. With intensive coastal infrastructure development both in Australia and elsewhere, the affects will be catastrophic.

The concluding Part 5, "The Age of Consequences", contains eight sections that range across a breadth of material. It begins by pointing out that Australia is located in a region with high population levels in South East Asia under threat from climate changes and the Pacific islands at serious risk from sea level rise. These are serious international political problems for Australia, and our recent behaviour in dealing with our near neighbours does not augur well. Section 35, "Redrawing Our Maps", attempts to show the nature and distribution of the changes Australia will experience should the currently predicted trends in climate eventuate. One interesting example is that the airports of Brisbane, Sydney, and Hobart will all be under water by 2100. That seems a long way off but to put it into context, people born this year will be 82 in 2100; it is within current lifetimes. The remainder of Part 5 consists of detailed discussions of health-related impacts of extreme heat and diseases such as those borne by mosquitoes that will likely increase in occurrence; the impacts on natural environmental resources, not least of which is the Great Barrier Reef; the attempts to develop international processes to deal with the driving issues of these changes; the political responses by

Australian governments to the threats of global warming; an overview of the developments and prospects of clean energy; and the warning that we are all in this together. In that final section it is rightly pointed out that there are substantial business opportunities in a low-carbon economy, so why is there so much resistance to it?

It is of concern that the warnings on climate change based on detailed and careful scientific analyses continue to be ignored by a significant and powerful section of the Australian Government. However, this political behaviour is but a continuation of the political approach to the realities of the Australian climate over the whole period since the arrival of Europeans. The political reactions to George Goyder's warnings to the South Australian Government in the 1870s are recounted in this book, and the experiences of Griffith Taylor could also be added to this historical analysis. Taylor made clear statements about the actual limitations to the nature of productive agriculture across the continent and was rewarded by the government of the day by effectively being hounded out of academia in Australia (he moved to North America in 1929). He holds the distinction of being the only scientist writing on climate issues to have his books banned by a government (Western Australia) and his books are still not held in the Western Australian State Library.

Finally, I should repeat here the quote from Peter Doherty on the jacket of this book: "A book that should be read by every Australian".

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