

carbon burned will still reside in the atmosphere after 1000 years. Even after 100000 years, 7% remains. While these figures are derived from carbon cycle models that will, inevitably, be improved as we learn more about the workings of the Earth system, we can be fairly certain about the long timescales involved. We need to recognise that burning fossil fuels now is committing us not just to a short-term ‘blip’ in climate, but to *The Long Thaw* of the title.

Archer argues his case well. As a palaeoclimatologist, specialising in the operation of the global carbon cycle on geological time scales, he is well placed to present the evidence for the need to take the long view and to argue that we need to restrict our total carbon emissions if we are to avoid long lasting, potentially dangerous climate change. This long term perspective sets the book apart from other recent offerings on global warming. Having said that, Archer starts fairly conventionally, with an exposition of the physics behind the greenhouse effect, an examination of recent observed climate change and a very brief summary of Inter Governmental Panel on Climate Change (IPCC) projections for the next century. He then leads the reader on a journey into the Earth’s past, looking at evidence for climate variability on timescales from millennia (the Holocene), through hundreds of millennia (glacial cycles) to millions of years (geological time), and shows how examining evidence for past climate change can help us to understand the workings of the global carbon cycle on long time scales. In the final part of the book, Archer demonstrates how this understanding can be applied to the problem of forecasting the long term fate of human generated CO<sub>2</sub> and the consequence of such forecasts for the prediction of climates into the deep future. An epilogue explores economic and ethical issues arising out of the science described within the book. Here the author is entering contentious territory, in which scientists, economists and politicians argue endlessly about the relative costs and benefits of various strategies for tackling climate change. Archer makes some interesting observations that are of relevance to this debate. In particular, he shows that carbon capture and storage, either in the oceans or in stable geological formations, is no panacea for avoiding the long lasting effects of climate change that he discusses in the book. However, it is doubtful that this observation will have much impact on policy. Carbon capture and storage could reduce the peak CO<sub>2</sub> concentrations over the coming couple of centuries and the focus of almost all policy decisions is on timescales even shorter than this. Decisions will probably be made on short term economic grounds,

but the ethical question remains – what right do we have to commit future generations to living with long term climate change in order that we may enjoy the short term benefits of burning fossil fuels?

The book does not have a particular polar focus, but Archer emphasises the importance of the polar regions in the global climate system and in the global carbon cycle. He discusses the role of methane hydrates in polar marine sediments and in permafrost as potential amplifiers of climate change through the carbon cycle. A notable omission from the book is any detailed discussion of the contribution of biological processes in the high latitude oceans to the carbon cycle. Indeed, the author’s emphasis throughout is on the physical pathways in the oceanic carbon cycle. The polar regions also feature in a short chapter on sea level rise, which summarises our current understanding of how two major ice sheets – Greenland and West Antarctica – will respond to a warming climate. Archer emphasises that current predictions of future sea level rise contain considerable uncertainties as a result of our imperfect understanding of how these ice sheets behave. There is a clear need for further research.

I found the book quite readable and felt that it usefully filled some gaps in my understanding of the global carbon cycle. However, I did find the text annoyingly repetitive in places. This seems to be a deliberate choice by the author to ensure that he gets his message across to all readers, even those who just skim through the book. Indeed, he almost encourages such behaviour by inviting the impatient reader to skip the detail contained in chapters 4–6 and rejoin the text at chapter 7. This is a strange invitation in a book that is already quite short, and begs the question of who the intended audience is. Presumably Archer wants to get his message across to politicians and their advisers, and recognises the importance of brevity when addressing this group. However, I fear that he may have overestimated the appetite of this group of readers for scientific detail. While the book only requires a very basic understanding of physics and chemistry, the author’s liberal use of equations and chemical formulae may put off some general readers. I hope that this is not the case, because the ideas expounded in the book are of great importance to the debate on climate change and deserve to be more widely appreciated. Let us hope that Archer’s message becomes widely understood and acted upon before we find that we have already committed ourselves to damaging (and potentially irreversible) climate change. (John King, Antarctic Climate and the Earth System Programme, British Antarctic Survey, High Cross, Madingley Rd., Cambridge CB3 0ET).

---

**OF DOGS AND MEN, FIFTY YEARS IN THE ANTARCTIC: THE ILLUSTRATED STORY OF THE DOGS OF THE BRITISH ANTARCTIC SURVEY 1944–1994.** Kevin Walton and Rick Atkinson. Foreword by HRH The Prince of Wales. 2nd edition. 2008. First published 1996. Malvern Wells: Images Publishing

(Malvern) Ltd. 190 p, illustrated, paper cover. ISBN 978-1-897-81755-1. US\$ 30.

doi:10.1017/S0032247409008547

This great and very informative book about the era of dog sledging in Antarctica was not written by journalists or

by historians, but by two (or, in fact, even more) of those men, who were an essential part of it: by experienced dog drivers. One of them, Kevin Walton, did his field work at the very beginning of the described era (1945–1948), while the other, Rick Atkinson, first went to Antarctica in the mid 1970s. He still returns every year for several months running the well known post office, museum and ‘shopping-mall’ at Port Lockroy for the British Antarctic Heritage Trust. The book benefits very much from their first hand experience, giving the reader an ‘inside glimpse’ of Antarctic exploration.

But even though dogs are of course the main topic of the book, the title already implies that men and their stories and adventures will be an important part of it. So this book in fact is more than ‘just’ a book for dog lovers, but it is very informative concerning the history and conditions under which the British Antarctic Survey (BAS) operated during the first 50 years.

In nineteen chapters the reader is informed about such basics as the strange continent of Antarctica itself, the work of BAS, the nature of the huskies, their behaviour and food as well as the methods of dog driving. Other chapters refer to the first expeditions with dogs in Antarctica and the introduction of Canadian dogs for travel purposes on the British bases at the end of World War II. In most chapters the authors give us a short and distinct introduction about the topic, followed by many of personal statements and extracts from dog drivers’ diaries from the very early days to the last days of that era, covering all the geographic parts of the peninsula. It is the achievement of the authors and is one of the most valuable points of the book, that they collected all those writings and selected the most interesting ones, otherwise not accessible to the greater public. Amongst the many contributors we find such illustrious names as Geoff Renner, Dave Fletcher, Wally Herbert and even Sir Vivian Fuchs.

In the main chapter we can read much about the adventurous travels done with the different dog teams throughout the 50 years they were used for the exploration of the Antarctic peninsula. With those stories the reader secures very close insights into how life, work and travelling was performed in those by far more primitive ways of exploration than those adopted nowadays. We learn about gales which kept the men in their tents for days and about sea ice which opened suddenly under homeward bound travellers, granting them just the time to loose their dogs before the men were precipitated into the water.

The book continues by discussing the breeding programme, medical care and the changes that took place in travel by using more and more improved mechanical vehicles such as motor toboggans and skidoos. So since the mid 60s the number of dogs was slowly decreasing until there were just two teams left, when the Antarctic Treaty organisation decided in 1991 to remove all dogs from the continent by April 1994. But for most of the

men involved in the work with the dogs, this was not an improvement. Especially in the hard and isolated conditions of the long Antarctic winter, no machine, however perfect, would ever be able to replace the devoted friendship of a dog!

Finally we follow the traces of those few dogs, which were not ‘put down’ after their hard working lives, but got an ‘honorary retirement’ in Wales or the Scottish Highlands. The last of the Antarctic dogs were brought ‘back’ to Canada in February 1994.

An appendix lists the total of numbers of imported, exported and Antarctic born dogs as well as their deaths on field journeys. Other figures show us the total mileages of travel done by dog teams (336.500!), their average performances (3.000) and the record breaking distances covered by the two dogs ‘Mac’ and ‘Bryn’ (14.440).

It is hard to think of anything related to British Antarctic sledgedogs, which is not covered and explained by the authors.

An astonishing group of 135 beautiful colour plates illustrate the pages throughout the book. With some of them dating back as far as 1946, they are a great source material for the everyday life and travel routine in those years, showing not only dogs, but as well the men, sledges, tents and other equipment in the wild of the great Antarctic landscape. So we can see for example the abandoned Stonington base still connected to the mainland by a natural glacier ramp in the early 1970s.

Even though the book is great and certainly a ‘must-have’ for anyone interested in recent polar exploration, it is also a reviewer’s duty to mention the weak points of it. Lucky enough, there is actually only one: the maps on the pages 31 and 38. In a book dealing with the geographic achievements of BAS, one should expect to find the correct latitude of the Antarctic Circle! The dates for the occupation periods of the bases are in some cases wrongly placed and therefore confusing. They should correspond better to the dates mentioned in the following chapters. The map on page 31 wishes to show ‘the landing points for early expeditions which included dogs’. But even though page 28 shows the famous picture of Lawrence Oates with the ponies and Siberian huskies onboard the *Terra Nova* in 1911, this expedition is for no good reason completely missing from the map. It is also surprising that Shackleton’s *Endurance* expedition took place until 1918. But even the last men from the Ross Sea Party were already rescued by 1917. And Shackleton was intending to land dogs somewhere on the eastern shores of the Antarctic peninsula, as the map suggests.

As the book was written by Antarctic dog drivers it is no wonder, that you can sense their non-agreement with the official ‘dogs out’ policy throughout the book. With this opinion they have the full support of the ecologically aware Prince of Wales, who states in his foreword that hopefully ‘a wiser generation may allow their return at some time . . .’ (Arne Kertelheim, Hofgut Kudach, 74731 Altheim, Germany.)