

The *Contraofensiva* [Counter-offensive] forms chapter five where President Juan Perón becomes a major Argentine proponent. A *Comisión Nacional del Antártico* was reorganised in 1946 and a list of its nine objects is given. The western boundary of *Antártida Argentina* was extended and more bases established. In Argentina this resulted in a patriotic effusion of anthems, poems, new toponyms, and similar public events. Chile was contemporaneously involved with Antarctic claims, made in 1940, and establishing stations. Relations between the South American states were formal, although a mutual territorial delimitation was not achieved. The three countries consolidated a form of *Treuga Polar* [Polar truce] by 1949. The chapter concludes with the Argentine expedition organised by Hernán Pujarto to establish a far southern base in Marguerite Bay at the site of the British Graham Land Expedition's 1936 station (although this is not mentioned). Chapter six, *La Guerra Silenciosa* [The silent war], reports the 'Hope Bay Incident' (one of the few outbreaks of the use of weapons in the region later under the Antarctic Treaty), disputes on Deception Island, establishing of a South Sandwich Island station, and related confrontations. World developments involving potential for atomic weapons and related occurrences also become implicated. Locally most of this is confined to exchanges of 'notes of protest'. The chapter ends with an account of an Argentine expedition reaching the South Pole overland and a further British initiative to place the disputes before the International Court of Justice in 1955.

The final chapter, *El Armisticio* [The armistice], not only recounts British and Argentine disputes but also refers to that between Argentina and Chile. The precedence of names of what is now generally known as the Theron Mountains, where Argentine toponymy was not published and became overtaken by English names is lamented but Pujarto's exploration of the interior of the continent is described. The Commonwealth Trans-Antarctic Expedition receives a brief mention questioning its scientific, versus political, significance. The Antarctic aspects of the International Geophysical Year 1957–1958 are discussed as *El Año de la Ciencia ... y la Política* [The year of science ... and politics]. This provided an opportunity for two politically opposed but powerful countries, Soviet Union and United States, to establish permanent stations in Antarctica and to investigate its potential resources. British politics and many multi-national scientific developments of the period are described. Possibility of sites for launching nuclear missiles and submarine bases are mentioned with the intensification of the 'cold war'.

The negotiation of the Antarctic Treaty is described succinctly and a note suggesting why Britain was the first and both Argentina and Chile the last to ratify it. Reference is made to the Anglo-Argentine conflict of 1982 which are asserted not to have involved areas in the Antarctic Treaty region, regardless of the

course and involvement of *Bahía Paraíso*. An epilogue briefly recapitulates the development of the Treaty and summarises subsequent Argentine activity with references to the Falkland Islands. This continues with contrasts of present numbers of stations of Britain and Argentina in *Antártida Argentina* observing the former are fewer.

The book has an unfortunate accumulation of errors, misconceptions, and omission of relevant material. Examples of them include the assertion of a British claim to parts of South America in defining the Falkland Islands Dependencies is indulged in a description of the claim made in 1908; the claim that the first radio transmissions from Antarctica were made in 1927 from the Argentine station on Laurie Island (the earliest were from Commonwealth Bay by Mawson's expedition in 1913); and territorial claims which resulted in defined territories by New Zealand, France, Australia and Norway are treated perfunctorily, as are those of the United States which did not reach this stage. It is also unexpected to see the winter base of the British Graham-Land Expedition (1934–1937) base described as an old house of the Australian explorer John Rymill (page 140).

There is a much simplified monochrome map of Antarctic regions at the beginning and many others of a similar style of particular locations throughout the book. The last shows the political claims on the continent. The illustrations, also monochrome, are numerous and well selected from a variety of sources to illustrate the themes. Unfortunately no list of maps nor of illustrations is provided. An appendix provides a useful, up to date, list of Argentine constructions in the Antarctic region with their positions, dates of establishment and some other information. Although a substantial proportion of these are no longer extant owing to extremes of polar weather, their number demonstrates the policy announced by President Perón of saturating *Antártida Argentina* with constructions, 16 bases and 65 refuges. None of the many other bases and refuges in the region are mentioned, but in the same period as the Argentine ones were built also many others had been deployed by Brazil, Britain, Chile, China (Beijing), Czechia, France, Germany, Korea (South), Poland, Soviet Union, Sweden, Ukraine, United States, and Uruguay. This might be interpreted as demonstrating a national, rather than an international, theme of the book.

There are also comprehensive footnotes throughout the chapters which are summarised in a concluding bibliography of about 100 entries. This usefully includes, with other references, most of the major Argentine works on the subject and many monographs. Unfortunately there is no index. Overall, the book provides a useful addition to Antarctic literature, although from the Argentine aspect. (Robert Headland, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER, UK (rk10@cam.ac.uk)).

THE CHANGING ARCTIC ENVIRONMENT. THE ARCTIC MESSENGER. David P. Stone. 2015. New York: Cambridge University Press. 360p, hardcover. ISBN 978-1-107-09441-3. US\$49.99. doi:[10.1017/S0032247415000662](https://doi.org/10.1017/S0032247415000662)

Not often do books on polar science (or science in general) begin with a citation from Lewis Carroll's *Alice's adventures in wonderland* nor bring into play the metaphor of an imaginary

being as a guide through their content. Perhaps even less often does one find a book whose author takes on the challenge of explaining the present state of knowledge about the Arctic environment – primarily its physical and chemical components – to a non-specialist audience, ranging from undergraduate students and researchers to policy makers, industry professionals and anyone concerned about the Arctic's fate.

David P. Stone certainly has the credentials to take up a challenge of this sort, with a PhD in oceanography and

more than forty years of experience in the management of environmental research. Stone has been involved in circumpolar cooperation since 1989, firstly with the Arctic Environmental Protection Strategy and later with the Arctic Council. He served as Canada's delegate on the Arctic Monitoring and Assessment Programme (AMAP) governing working group until 2004 and was the chair of AMAP between 1993 and 1997, in the early days when AMAP was setting up a circumpolar monitoring capacity and producing its first circumpolar assessment of the state of the Arctic environment. Stone also played an important role in works on persistent organic pollutants (POPs) under the United Nations Economic Commission for Europe's (UNECE) Convention on Long-Range Transboundary Air Pollution (CLRTAP) and then in the negotiation of the Stockholm Convention on POPs. Finally, he was one of leading figures in the creation of the University of the Arctic. His life-long engagement in Arctic affairs gives him a good perspective from which to reflect upon the changes taking place in the natural environment of the region as well as some of the international community's responses to them.

The titular Arctic messenger is a phrase taken from one of the conferences organised by AMAP in 2011. In this book, however, the Arctic messenger is imagined as a living entity, 'a harbinger (...) [with] omnipotent consciousness' akin to 'the Sumerian Utnapishtim or the biblical Methuselah' (page 11). This messenger can inform us about the state of the Arctic and warn the humankind of the lunacy of ignoring the consequences of Arctic environmental change. According to Stone, our increasing comprehension of Arctic environmental science enables us to listen to the messenger, yet the question posed at the beginning of the book concerns the extent to which we have heard (and understood) this harbinger.

In addition to introducing the reader to the Arctic messenger, Stone is very clear about what his volume is *not*. It is not a review of Arctic environmental science over that last four decades, nor is it a summary of more than twenty years of Arctic international cooperation. Instead, it is a personal selection of evidence illustrating Arctic change and some of the key developments that have expanded our knowledge about the state of the Arctic and the role it plays in the global ecosystem. The focus throughout the book is on the physical, chemical and toxicological aspects of the story - in particular persistent organic pollutants (POPs), mercury and climate change, as well as (to a lesser degree) radioactivity, acid rain and ozone depletion. The author addresses the issues of Arctic wildlife and indigenous cultures only in relation to the harmful impacts they experience as a result of human activities located at lower latitudes; however, in recognition of the limits of his own expertise, he explicitly leaves the full coverage of those themes to others.

The book consists of four main parts plus five appendices of climate and geophysical background information. The main parts of the book are preceded by the personal reflections concerning the author's path into Arctic research and international cooperation, interspersed with moments from his personal life - including insights into how the Arctic has been to him 'a magic that has never weakened' (page 5). The first part, including one short chapter on the titular Arctic messenger, provides a brief overview of Arctic environmental change and a summary of what follows. The second part is a short account of the beginnings of circumpolar international cooperation and is dedicated primarily to AMAP, a working group and a key element in the architecture of the Arctic Council, respons-

ible for monitoring and assessment of the state of the Arctic environment.

After the two introductory sections the reader embarks on the main, more substantial part of the book, which consists of seven chapters dealing with the present state of knowledge on radioactivity, acidification and Arctic haze, ozone depletion, persistent organic pollutants (POPs), heavy metals (including mercury), and climate change in the Arctic. Among those seven chapters two short ones, on the International Polar Years (IPYs) and changes in the conduct of marine science in the Arctic under the continuous emergence of new technologies, 'provide the brain with a little rest' (page 8) while going through more information laden sections of the book. Each of the five science chapters begins with the fundamentals, many of which take the reader back to secondary school physics and chemistry, so even those from different academic backgrounds (like the author of this review) can understand the mechanisms and processes altering the Arctic environment. The science chapters also tell the story of how scientists came to learn of the Arctic's environmental challenges and what the international political community has done (or not) to address them. Lastly, each chapter concludes with a useful summary of the main points to retain and a list of suggested further readings for those willing to go deeper into the covered topics.

The fourth part of the book includes two chapters and the epilogue in which Stone shares his thoughts on the utmost importance of education, training and Arctic research as well as the necessity of raising public awareness on the state of the Arctic environment. In the final chapter he seeks to answer the question he posed at the beginning of the volume: whether the Arctic messenger has been noticed. In the epilogue he offers an essential short series of prescriptions addressed to the Arctic Council, 'to keep the Rovaniemi flame alive' (page 300) (in a reference to the town in northern Finland where the AEPS was signed) and to act boldly in face of the greatest threat to both the Arctic and the global ecosystem - climate change.

As a whole, *The changing Arctic environment...* is a greatly informative and enjoyable book that succeeds in explaining complex physical and chemical processes in a manner understandable to the general public. Stone thus achieves the goal he set for himself: to help making accessible the knowledge of Arctic change and its global implications. Moreover, he has written a book that does not have to be read all at once; each of the science chapters stand on their own. The author even offers a handful of tips to the reader, such as 'if a section is (...) interminably boring, my advice is to skip it until you land on something tastier' (page 7-8). In the book, 'tastier' parts are easy to find, for example where Stone recalls his personal heroes and heroines -charismatic figures like Sheila Watt-Cloutier, Lars-Otto Reiersen or Robert Corell- whose impact on the Arctic collaborative developments cannot be overstated. This approach, as well as questions addressed directly to the reader, maintains a sense of contact with an author who genuinely cares about keeping his audience engaged and curious.

The sense of engagement is also a more general trait of this publication, revealing the author's passionate concern for the fate of the Arctic and the entire planet in the face of climate change. David P. Stone is as comfortable writing about the toxicology of persistent organic pollutants as he is in engaging our moral responsibility to combat threats to the Arctic environment - a tall order that not many are willing to take on. To conclude, *The changing Arctic environment...* is a highly commendable volume that brings Arctic environmental science

closer to a non-specialised audience. It is also an excellent addition to a slowly growing body of titles that take readers back to the early days of international circumpolar collaboration and show the way that has been taken from there. These include *Ice and water. Politics, peoples and the Arctic Council* by John English, the autobiographical *The right to be cold* by Sheila Watt-Cloutier, and *IASC after 25 Years*, the historical account of the International Arctic Science Committee (IASC).

All four of these volumes, written from different perspectives, allow us to fully appreciate the by no means little achievements made to date. At present the open question is: What will the next stages of circumpolar cooperation look like? Which path will their evolution take? With David P. Stone's book, the reader receives in hand a won-

derful guide to understanding the changes taking place in the Arctic environment as well as to lessons learnt from the past experience in how the international community can –and should– respond to them. (Malgorzata Smieszek, Arctic Centre, University of Lapland, PO Box 122, 96101 Rovaniemi, Finland (malgorzata@smieszek@ulapland.fi))

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