

GLACIER: NATURE AND CULTURE. By PETER B. KNIGHT. London: Reaktion Books, Earth Series, 2019. ISBN 978-1-78914-134-4. 224 p., b&w and colour illus., bib., index. Softbound. US\$24.95

A glacier is a mass of ice, formed by the accumulation and compaction of snow over time, that slowly moves over the landscape. Glaciers are scientifically important and culturally significant. Where present, they store water and release it during the melt season. They are also especially vulnerable to climate change, leading to major short- and long-term concerns. In his most recent book, *Glacier*, Peter G. Knight paints an extraordinary, well-rounded picture of the world's glaciers. Knight is a geographer whose work merges the disciplines of glaciology and geomorphology. Since 1984, he has embarked on field expeditions and conducted laboratory experiments. His main research involves examining how sediment becomes incorporated into basal (bottom) ice layers of glaciers and how that affects glacier behaviour and glacial landforms. If you have studied glaciers in any capacity, you have likely come across Knight's work in academic journals, such as *Nature Communications* (Cook et al. 2020) and *Journal of Glaciology* (Knight et al. 2002) and in both books and encyclopedia chapters. Presently, he is a reader in Geography at Keele University in Staffordshire, United Kingdom and lives near Whitchurch; appropriately, on a glacial moraine.

*Glacier* is a contribution to the *Reaktion Earth Series*, a series of books about natural phenomena written by passionate experts through blending the lenses of history, culture, and science. The book starts with an overview of scientific, cultural, and artistic ways of thinking about glaciers, and the roles glaciers play in human lives (Chapter 1). This is followed by chapters on the science of glacier formation and physics of their movement (Chapter 2), the Earth's history of climate change and glaciation (Chapter 3), and a history of the research and science on glaciers (Chapter 4). The story continues as Knight weaves the roles of glaciers in the Earth's climate system (Chapter 5) and economy (Chapter 6). Several chapters delve into the representation of glaciers in art (Chapter 7), literature, music (Chapter 8), and tourism (Chapter 9). Knight concludes his exploration of glaciers by speculating on future relationships between glaciers and climate, landscape, people, and resources (Chapter 10).

This book exemplifies Knight's ability to explain complex ideas with ease and simplicity. Knight's writing makes the book accessible to a wide range of audiences; to the glaciologist, the book offers a dimension of seeing glaciers through the artistic and cultural lenses; to the casual reader, it offers the background to understand the scientific significance of glaciers. I particularly appreciate the concise summary of the Earth's climate history. The theories behind the history of climate and its reconstruction can be complicated, but Knight's explanation is one of

the clearest I have come across in writing. His extensive knowledge and experience are supplemented with references to works by other glaciologists and artists from around the world. Knight is undoubtedly an expert in the subject matter and knows his field profoundly, I cannot think of a better person to tell a holistic story of glaciers.

*Glacier* takes the reader on a global tour with photographs, examples of glaciers, and stories from north to south, and everywhere in between. One of the unique qualities of glaciers is that they occur in the world's tropical and mid-latitude regions at high elevations, which may not be intuitive knowledge to everyone. The mid-latitude mountain glaciers are at greatest risk of accelerated melting and posing associated threats to communities downstream of them, including flooding in the short-term and water shortage in the long-term. The book is filled with outstanding visual aids, and although I appreciated the spatial breadth of Knight's writing, maps would have guided the reader to the locations of glaciers mentioned in the text.

One of my favourite aspects of this book is the photographs and art included on nearly every page. The book contains 114 illustrations, with 94 in colour. The two-page spreads of glaciers and landscapes are captivating and a welcome opportunity to break from reading, immerse visually, and reflect on the majesty of world's glaciers. Likewise, numerous photos of paintings show the timeless importance of glaciers in art. However, the writing does not directly reference the illustrations. In-text references would direct the reader to make connections between what they are reading and seeing.

As a glaciologist, I have extensive knowledge of the science of glaciers; the discussion on the role of glaciers in nature, art, and culture was less familiar to me and captured my attention. Knight discusses glaciers in traditional stories and mythologies, including the work of anthropologist Dr. Julie Cruikshank (2005) in Yukon and Alaska. Discussions around informing natural science with Indigenous ways of knowing are gaining traction in the academic community, particularly in Canada where I work (Wong et al., 2020). In light of the growing movement toward reconciling Western and Indigenous ways of knowing, the story of glaciers would have benefitted from a dedicated discussion of the contributions Indigenous Knowledge makes to the field of glaciology.

Glaciers mean different things to different people. They are universally important, whether they have shaped the land you live on, are a source of water to your tap, or provide you with a place for adventure and grounding. "Glaciers have become symbols both of pristine wilderness and of human-induced environmental change. This is reflected in the way glaciers are treated in art as well as in science" (p. 196). Peter Knight masterfully blurs the boundary between art and science, and tells a balanced story of the incredible, yet quickly disappearing glaciers. *Glacier* is a book deserving a place in everyone's library.

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