

BOOK REVIEW

Book Review: *Glaciovolcanism on Earth and Mars: Products, Processes and Palaeoenvironmental Significance*. (2016) By John L. Smellie and Benjamin R. Edwards. Cambridge University Press. ISBN-13: 9781107037397, 490 pages. \$140.

Glaciovolcanism on Earth and Mars: Products, Processes and Palaeoenvironmental Significance is an excellent addition to an exciting field of research. It represents the first comprehensive textbook-style volume dedicated entirely to the study of glaciovolcanism and comes with impeccable timing as this area of research is currently experiencing rapid growth.

Glaciovolcanism, as a process, incorporates the interactions between volcanoes and ice in all of its forms. *Glaciovolcanism*, the book, presents an in-depth discussion of the eruptive processes and distinctive deposit characteristics of glaciovolcanic eruptions on Earth and Mars. The book is 490 pages long and is heavily supported with figures from relevant publications. The target audience is volcanology researchers and postgraduate students; however, it would be an useful resource to anyone interested in or dealing with these highly specialized volcanoes (for example, Quaternary scientists, planetary scientists, glaciologists, geomorphologists, and government, city, and aviation workers).

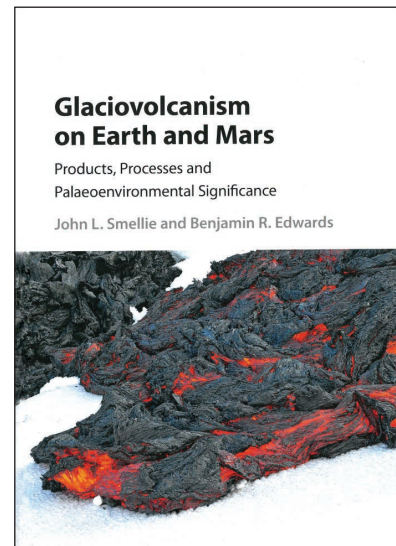
Smellie and Edwards present information in a clear, concise, and comprehensive manner. The first two chapters provide an overview of the field including: history of the study, the importance of the research, an overview of the many styles of glaciovolcanism and the overall distribution of global glaciovolcanism. Following this, the authors guide the reader through a synthesis of almost all pertinent research, covering the physical properties of ice and glaciovolcanic lavas and the physics underpinning glaciovolcanic interactions. The authors then introduce typical glaciovolcanic lithofacies associations and edifice morphologies, and outline a method for the classification of these unique landforms. These sections are organized by magma composition (mafic, intermediate, and felsic), making navigation easy. The science of glaciovolcanism has always been underpinned by field studies, and the authors' combined vast field experience is reflected in this book. They use numerous field photographs from their personal collections and dedicate a significant portion of the book to the appropriate recognition and classification of the deposits in the field. For future volumes, it would be good to see the color figure section (currently only 16 pages) expanded and distributed more evenly throughout the book.

The final five chapters go further to explore the applications

of glaciovolcanism such as the potential of these edifices for paleoenvironmental reconstructive purposes, the possible causal linkages and climatic triggers that may exist between volcanoes and the cryosphere, and their use in the study of extraterrestrial planetary bodies (namely, Mars). The authors fully outline each idea, calculation, or model using a clear, logical approach and frequently provide helpful additional comments, comparisons, and examples.

The comprehensive collection of references is probably the greatest contribution of this book and is an invaluable resource for anyone working in the field. Inevitably, *Glaciovolcanism on Earth and Mars: Products, Processes and Palaeoenvironmental Significance* will accelerate the rate of glaciovolcanic research, improve appropriate referencing, and encourage interdisciplinary and international collaborations. The glossary is another useful supplement that should not be overlooked, providing a necessary perspective on numerous misused or contradictory terms (for example, tuyas and tindars).

This book achieves the authors' aim to provide the first global synthesis of glaciovolcanism as a discipline of the Earth Sciences. They have embarked on a large challenge, however: in such a rapidly evolving field of research, successive volumes and updates will be frequently required.



ALEXANDER M. WILSON
Volcanology & Petrology Laboratory,
Earth Ocean & Atmospheric Science,
University of British Columbia,
2020–2207 Main Mall,
Vancouver, BC V6T 1Z4
Canada