Humanity’s ever-increasing hunger for mineral raw materials, caused by a growing global population and ever increasing standards of living, has resulted in economic geology becoming a subject of urgent importance.

This book provides a broad panorama of mineral deposits, covering their origin and geological characteristics, the principles of the search for ores and minerals, and the investigation of newly found deposits. Practical and environmental issues that arise during the life cycle of a mine and after its closure are addressed, with an emphasis on sustainable and “green” mining.

The central scientific theme of the book is to place the extraordinary variability of mineral deposits in the frame of fundamental geological processes.

The book is written for earth science students and practicing geologists worldwide. Professionals in administration, resource development, mining, mine reclamation, metallurgy, and mineral economics will also find the text valuable.

WALTER L. POHL is Emeritus Professor and former Dean of the Faculty of Geosciences at the Technical University of Braunschweig, Germany, and a consulting geologist in economic, engineering and environmental geology. For more information visit: www.walter-pohl.com

A companion website with additional resources is available at: www.wiley.com/go/pohl/geology
Economic Geology
To the Memory of Walther E. Petrascheck
(1906–1991)

Inspiring Geologist and Academic Teacher

COMPANION WEBSITE
This book has a companion website:
www.wiley.com/go/pohl/geology
with Figures and Tables from the book for downloading
Economic Geology Principles and Practice

Metals, Minerals, Coal and Hydrocarbons – Introduction to Formation and Sustainable Exploitation of Mineral Deposits

Walter L. Pohl
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Wisely used, mineral resources create wealth, employment, a vital social and natural environment and peace. If the reverse of these conditions occurs only too often, illustrating the so-called “resource curse”, this should be attributed to the true perpetrators, namely irresponsible, weak or selfish leaders. This book, however, does not intend to provide rules for good governance. I wrote it as a broad overview on geoscientific aspects of mineral deposits, including their origin and geological characteristics, the principles of the search for ores and minerals, and the investigation of newly found deposits. In addition, practical and environmental aspects are addressed that arise during the life-cycle of a mine and after its closure. I am convinced that in our time, economic geology cannot be taught, studied or practised without an understanding of environmental issues. The scientific core of the book is the attempt to present the extraordinary genetic variability of mineral deposits in the frame of fundamental geological process systems. The comprehensive approach – covering materials from metal ores to minerals and hydrocarbons – is both an advantage and a loss. The second concerns the sacrifice of much detail but I chose the first for its benefit of a panoramic view over the whole field of economic geology. Being aware that the specialist level of subjects presented in this book fills whole libraries, I do hope that even experienced practitioners, academic teachers and advanced students of particular subjects will find the synopsis useful.

Over more than 50 years, five editions of this book were published in German. Since the first edition (Wilhelm & Walther E. Petrascheck 1950), the book was intended to provide a concise introduction to the geology of mineral deposits, including its applications to exploration and mining. The target audience has changed, however. Originally, it was written for students of mining engineering. Today, it is mainly directed to aspiring and practising geologists. Each of the seven chapters of the book was developed with my own students as a university course and should be useful to fellow academic teachers. After initially working in industry I never lost contact with applications of economic geology, which is my motive for the constant interweaving of practical aspects in the text and for dedicating one of the chapters to the practice of economic geology. For professional reference purposes, practitioners in geology and mining should appreciate this melange of science and application. Frequent explanations and references to environmental and health aspects of extraction and processing of ores and minerals should assist users involved in environmental work. To those with no background in geology, I recommend they acquire an introductory geoscience text for looking up terms that are employed but cannot be explained in the available space.

Compared with the last German edition (Pohl 2005), this book has been rewritten for an international public. Although it retains a moderate European penchant by referring to examples from this region, important deposits worldwide are preferentially chosen to explain genetic types and practical aspects. I trust that this will be useful to both scholars and practitioners, wherever they work. Generally, it was my ambition to present the state of the art in economic geology, by referring to and citing recent publications as well as earlier fundamental concepts. This should assist and motivate students to pursue topics to greater depth.

Many people have supported me in my life-long pursuit of theory and practice of economic geology, and helped with this book, especially by donating photographs. I cannot name them all but in captions, donors are acknowledged. Here, just let me say thank you.

Walter L. Pohl