

Earth Science 2013



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princeton primers in climate

Princeton Primers in Climate is a new series of short, authoritative books that explain the state of the art in climate-science research. Written specifically for students, researchers, and scientifically minded general readers looking for succinct and readable books on this frequently misunderstood subject, these primers reveal the physical workings of the global climate system with unmatched accessibility and detail. *Princeton Primers in Climate* is the ideal first place to turn to get the essential facts, presented with uncompromising clarity, and to begin further investigation—whether in the classroom or in one’s own reading chair.

FORTHCOMING

Paleoclimate

Michael L. Bender

“Paleoclimatology has been missing a concise, modern, overview textbook, and I think this book will fill that niche. There is much ground to cover and the text does a good job of bringing the reader up to speed on most of the important patterns and processes in Earth’s climatic history. The book combines excellent coverage of basic physical and chemical aspects of the climate system with a long-term historical overview of the climate system in action.”

—Matthew Huber, Purdue University

The most up-to-date overview on the subject, *Paleoclimate* provides an ideal introduction.

Michael L. Bender is professor of geosciences and atmospheric/ocean sciences at Princeton University.

July 2013. 256 pages. 40 line illus.
Pa: 978-0-691-14555-6 \$27.95 | £19.95
Cl: 978-0-691-14554-9 \$80.00 | £55.00

FORTHCOMING

Climate and Ecosystems

David Schimel

“This compelling book provides an excellent summary of the interactions between ecosystems and climate.”

—Richard Houghton, Woods Hole Research Center

How does life on our planet respond to—and shape—climate? This question has never been more urgent than it is today, when humans are faced with the daunting task of guiding adaptation to an inexorably changing climate. This concise, accessible, and authoritative book provides an unmatched introduction to the most reliable current knowledge about the complex relationship between living things and climate.

David Schimel is a senior research scientist at the Jet Propulsion Lab in Pasadena, California.

June 2013. 256 pages. 19 line illus.
Pa: 978-0-691-15196-0 \$27.95 | £19.95
Cl: 978-0-691-15195-3 \$80.00 | £55.00

Cover image: Fox Glacier, South Island, New Zealand. Te Wahipounamu UNESCO World Heritage Area. © Claudia Newland. Courtesy of Shutterstock.

NEW

Atmosphere, Clouds, and Climate

David Randall



“This lucid book gives a tour of the most important atmospheric processes determining climate.”

—Tapiro Schneider, California Institute of Technology

The atmosphere is critical to climate change. It can amplify shifts in the climate system, and also mitigate them. This primer offers a short, reader-friendly introduction to these atmospheric processes and how they work, written by a leading expert on the subject.

David Randall is professor of atmospheric science at Colorado State University.

2012. 288 pages. 19 halftones. 21 line illus. 5 tables.

Pa: 978-0-691-14375-0 \$27.95 | £19.95

Cl: 978-0-691-14374-3 \$75.00 | £52.00

Climate and the Oceans

Geoffrey K. Vallis



“In this crystal-clear little book, Geoffrey Vallis masterfully explains the basics of physical oceanography and the role of the oceans in the climate system.”

—Richard Somerville, Scripps Institution of Oceanography

2011. 248 pages. 32 line illus. 2 tables.

Pa: 978-0-691-15028-4 \$24.95 | £16.95

Cl: 978-0-691-14467-2 \$80.00 | £55.00

The Global Carbon Cycle

David Archer



“Fossil-fuel carbon is our dangerous treasure. David Archer brilliantly and lucidly provides the essential background on Earth’s carbon cycle that we need to make wise decisions about future use.”

—Richard B. Alley, Pennsylvania State University

2010. 216 pages. 25 line illus.

Pa: 978-0-691-14414-6 \$29.95 | £19.95

Cl: 978-0-691-14413-9 \$72.50 | £50.00

The Cryosphere

Shawn J. Marshall



“This is one of the best, most up-to-date books about the state of the cryosphere and an excellent read.”

—Eric Rignot, University of California, Irvine

2011. 304 pages. 34 line illus. 8 tables.

Pa: 978-0-691-14526-6 \$24.95 | £16.95

Cl: 978-0-691-14525-9 \$80.00 | £55.00

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Natural Climate Change

Mark Cane

The Sun’s Influence on Climate

Joanna D. Haigh

Planetary Climates

Andrew Ingersoll

Abrupt Climate Change

Jonathan Overpeck

Terrestrial Hydrology and the Climate System

Eric F. Wood

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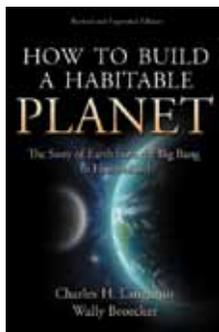
NEW

Revised and Expanded Edition

How to Build a Habitable Planet

The Story of Earth from the Big Bang to Humankind

Charles H. Langmuir & Wally Broecker



"As NASA continues to assess the habitability of our planetary neighbor, Mars, this insightful and approachable book is a timely reminder of how important it is to understand the habitability of our own Earth. Comprehensive and up-to-date, it exposes

how ideas, imperfect understanding, and controversies drive scientific knowledge forward."

—Roger Everett Summons, Massachusetts Institute of Technology

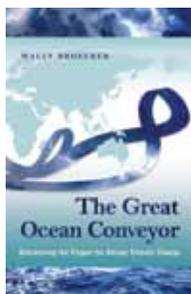
Charles H. Langmuir is the Higgins Professor of Geochemistry at Harvard University. Wally Broecker is the Newberry Professor of Earth and Environmental Sciences at Columbia University.

2012. 752 pages. 16 color plates. 62 halftones. 220 line illus. 18 tables.
Cl: 978-0-691-14006-3 \$39.95 | £27.95

The Great Ocean Conveyor

Discovering the Trigger for Abrupt Climate Change

Wally Broecker



"Wally Broecker is one of the great pioneers of paleoclimatology.... Relating his breakthroughs and setbacks, he portrays science as a 'continual struggle to understand more fully and more accurately how the world really works.'"

—*Nature*

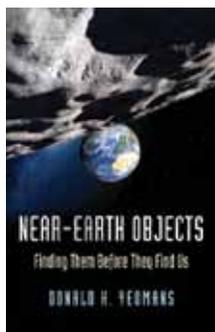
2010. 176 pages. 10 halftones. 40 line illus. 12 maps.
Cl: 978-0-691-14354-5 \$28.95 | £19.95

FORTHCOMING

Near-Earth Objects

Finding Them Before They Find Us

Donald K. Yeomans



"This is a wonderful and timely book, not to mention a great read! Asteroids are indeed wondrous objects, and it is simply a matter of time before we find one with our address on it. Yeomans' unparalleled expertise, storytelling skills, and wry sense of

humor are a savory delight. Enjoy!"

—Rusty Schweickart, *Apollo 9* astronaut

Donald K. Yeomans is a fellow and senior research scientist at the Jet Propulsion Laboratory, where he is manager of NASA's Near-Earth Object Program Office and supervisor of the Solar System Dynamics Group.

December 2012. 192 pages. 20 halftones. 19 line illus. 6 tables.
Cl: 978-0-691-14929-5 \$24.95 | £16.95

FORTHCOMING PAPERBACK

Finalist, 2011 Lane Anderson Award, Fitzhenry Family Foundation
One of *Choice's* Outstanding Academic Titles for 2011
One of *Library Journal's* Best Sci-Tech Books for 2011

With a new afterword by the author

Strange New Worlds

The Search for Alien Planets and Life beyond Our Solar System

Ray Jayawardhana



"I felt the thrill of briefly sharing in the efforts of these planet-seeking scientists and seeing the universe through their eyes."

—Mike Brown, *Wall Street Journal*

Ray Jayawardhana is professor and Canada

Research Chair in Observational Astrophysics at the University of Toronto.

May 2013. 280 pages. 3 halftones. 25 line illus. 4 tables.
Pa: 978-0-691-15807-5 \$17.95 | £12.50
Cl: 978-0-691-14254-8 \$24.95 | £16.95

Not for sale in Canada

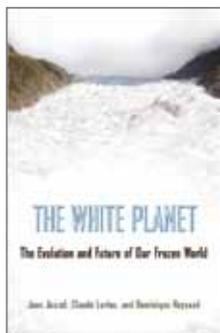
FORTHCOMING

The White Planet

The Evolution and Future of Our Frozen World

Jean Jouzel, Claude Lorius & Dominique Raynaud

Translated from the French by Teresa Lavender Fagan



"*The White Planet* is a fascinating account of ice and climate change—and why we should be concerned for the future of life on Earth. The authors are world leaders in the study of the cryosphere, and the science in this book is

very strong and thorough."

—Jo Jacka, chief editor of the *Journal of Glaciology*

Jean Jouzel, Claude Lorius, and Dominique Raynaud are internationally acclaimed scientists who have won many awards for their work documenting long-term climate change through the study of deep ice cores.

January 2013. 336 pages. 1 halftone. 33 line illus. 3 tables. 2 maps.
Cl: 978-0-691-14499-3 \$29.95 | £19.95

FORTHCOMING

Invisible in the Storm

The Role of Mathematics in Understanding Weather

Ian Roulstone & John Norbury



Accessible and timely, *Invisible in the Storm* explains the crucial role of mathematics in understanding the ever-changing weather.

Ian Roulstone is professor of mathematics at the University of Surrey. John Norbury is a

fellow in applied mathematics at Lincoln College, University of Oxford.

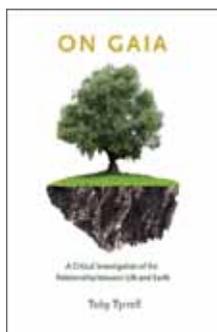
March 2013. 384 pages. 15 color illus. 76 halftones. 77 line illus.
Cl: 978-0-691-15272-1 \$35.00 | £24.95

FORTHCOMING

On Gaia

A Critical Investigation of the Relationship between Life and Earth

Toby Tyrrell



"Toby Tyrrell unravels the various formulations of Gaia and explains how recent scientific developments bring the hypothesis into question. His criticisms are insightful, profound, and convincing, but fair. *On Gaia* is wonder-

fully informative and a pleasure to read."

—Francisco J. Ayala, author of *Am I a Monkey?: Six Big Questions about Evolution*

Toby Tyrrell is professor of Earth system science at the National Oceanography Centre Southampton (University of Southampton).

June 2013. 312 pages. 46 halftones. 10 line illus. 12 tables.
Cl: 978-0-691-12158-1 \$35.00 | £24.95

Winner of the 2003 Phi Beta Kappa Book Award in Science

Life on a Young Planet

The First Three Billion Years of Evolution on Earth

Andrew H. Knoll

"Andrew Knoll is an ideal guide through this early phase of life's history on the Earth."

—Stefan Bengtson, *Nature*

Princeton Science Library

2004. 296 pages. 33 color illus. 25 halftones. 47 line illus.
Pa: 978-0-691-12029-4 \$27.95 | £19.95

One of the *Financial Times*' Best Books on Science for 2011
One of the *Boston Globe*'s Best Books on Science for 2011

Reinventing Discovery

The New Era of Networked Science

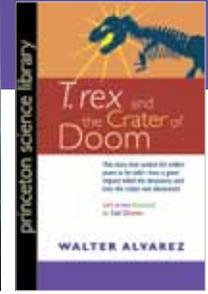
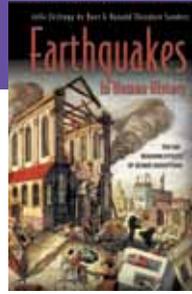
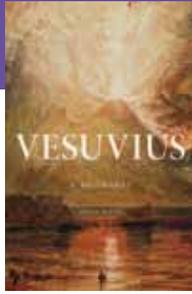
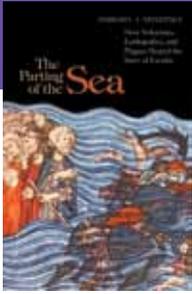
Michael Nielsen

"[A] thought-provoking call to arms.... *Reinventing Discovery* will frame serious discussion and inspire wild, disruptive ideas for the next decade."

—Chris Lintott, *Nature*

2011. 272 pages. 6 halftones. 8 line illus.
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Predicting the Unpredictable
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With Dawn Burgess

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Also by Jelle Zeilinga de Boer & Donald Theodore Sanders
With a foreword by Robert D. Ballard
Volcanoes in Human History
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How Life on Earth Nearly Ended 250 Million Years Ago
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2008. 320 pages. 32 halftones. 32 line illus.
Pa: 978-0-691-13628-8 \$24.95 | £16.95

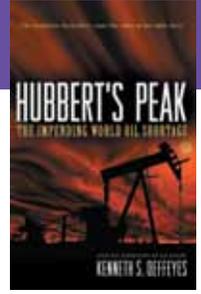
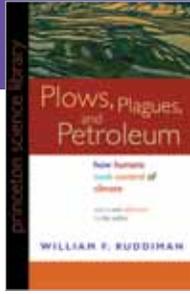
One of the *New York Times* Notable Books of 1997
With a new foreword by Carl Zimmer
T. rex and the Crater of Doom
Walter Alvarez

Princeton Science Library

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 Donatella De Rita**

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Princeton Science Library

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 Pa: 978-0-691-14634-8 \$19.95 | £13.95

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Ice Cores, Abrupt Climate Change, and Our Future

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2002. 240 pages. 13 halftones. 22 line illus.
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S. George Philander

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Also by S. George Philander

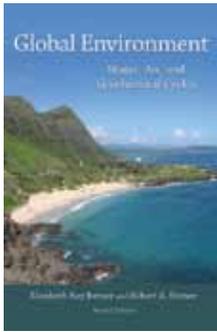
Is the Temperature Rising?

The Uncertain Science of Global Warming

2000. 240 pages. 8 halftones. 85 line illus. 5 tables.
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NEW

Second Edition

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Elizabeth Kay Berner & Robert A. Berner

This newly revised edition of *Global Environment* discusses the major elements of the geochemical cycles and global fluxes found in the atmosphere, land, lakes, rivers, biota, and oceans, as well as the human effects on these fluxes. Retaining the strengths of the original edition while incorporating the latest discoveries, this textbook takes an integrated, multidisciplinary, and global approach to geochemistry and environmental problems and introduces fundamental concepts of meteorology, surficial geology (weathering, erosion, and sedimentation), biogeochemistry, limnology, and oceanography.

Elizabeth Kay Berner is a lecturer in geology at the University of Connecticut and research affiliate in the Department of Geology and Geophysics at Yale University. Robert A. Berner is the Alan M. Bateman Professor of Geology and Geophysics Emeritus at Yale University.

2012. 464 pages. 31 halftones. 116 line illus. 83 tables.
Cl: 978-0-691-13678-3 \$85.00 | £59.00

"[T]his new edition of *Global Environment* provides a solid starting point for understanding geochemistry's role in the modern debates over global climate change."

—Jess Adkins, California Institute of Technology

FORTHCOMING

Climate Dynamics

Kerry H. Cook

"Climate change and its impacts are being embraced by a wider community than just earth scientists. A useful textbook, *Climate Dynamics* covers the basic science required to gain insights into what constitutes the climate system and how it behaves. While still being quantitative, the material is written in a lecture-note style that creates a simplified, but not simple, approach to teaching this complex subject."

—Chris E. Forest, Pennsylvania State University

Climate Dynamics is an advanced undergraduate-level textbook that provides an essential foundation in the physical understanding of the earth's climate system.

Kerry H. Cook is a professor in the Department of Geological Sciences at the Jackson School of Geosciences at the University of Texas, Austin.

April 2013. 248 pages. 81 halftones. 38 line illus. 7 tables.
Cl: 978-0-691-12530-5 \$65.00 | £44.95

FORTHCOMING

Ecology of Climate Change

The Importance of Biotic Interactions

Eric Post

"I believe that this book will become the go-to reference for gaining a foundational understanding of how global climate change has and will continue to transform ecological systems in the face of anthropogenic impacts. An encyclopedic synthesis of the field, it provides exemplary coverage of the vast literature."

—Oswald J. Schmitz, Yale University

In a remarkably comprehensive synthesis, this book presents past, ongoing, and future ecological responses to climate change in the context of two simplifying hypotheses, facilitation and interference, arguing that biotic interactions may be the primary driver of ecological responses to climate change across all levels of biological organization.

Eric Post is professor of biology and ecology at Pennsylvania State University.

Monographs in Population Biology, 52

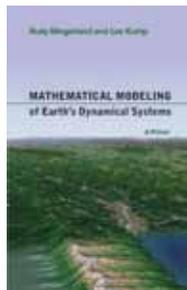
July 2013. 392 pages. 124 line illus.
Cl: 978-0-691-14847-2 \$59.50 | £41.95

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Mathematical Modeling of Earth's Dynamical Systems

A Primer

Rudy Slingerland & Lee Kump



"[A] must-read for all geoscientists, and not just students. This excellent primer offers bite-size gems of insight into the world of quantitative geosciences applications, covers both mathematical and modeling concepts, and offers practical exercises to build

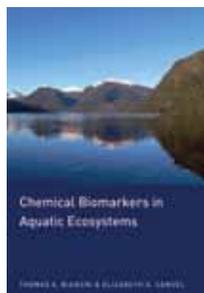
expertise. Course notes and methodologies will be improving across our academies."

—James P. M. Syvitski, Community Surface Dynamics Modeling System

2011. 248 pages. 3 halftones. 72 line illus. 9 tables. 1 map.
Pa: 978-0-691-14514-3 \$55.00 | £37.95
Cl: 978-0-691-14513-6 \$105.00 | £72.00

Chemical Biomarkers in Aquatic Ecosystems

Thomas S. Bianchi & Elizabeth A. Canuel



"Bianchi and Canuel have done an extraordinary job of capturing the essence of biomarker geochemistry in their timely and important book. They give an in-depth overview of this discipline from its roots more than a half-century ago to

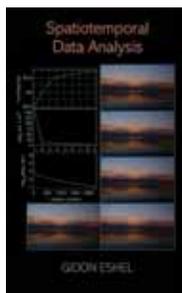
the present day. In doing so, they explain the fundamentals of molecular and isotopic organic geochemistry, and they describe interesting applications of these tracers for improving understanding of organic matter origins and cycles in marine, estuarine, and freshwater settings."

—Philip A. Meyers, University of Michigan

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Spatiotemporal Data Analysis

Gidon Eshel



"*Spatiotemporal Data Analysis* is accessible and applicable without sacrificing rigor. The key is a steady stream of well-chosen examples and, most unusual in any textbook, a distinctive narrative voice that guides readers through the material, explaining

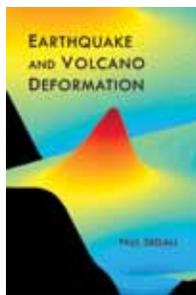
the details while making sure the big picture is always in view. It will become an essential text for earth scientists and many others who analyze spatiotemporal data."

—Mark Cane, Columbia University

2012. 336 pages. 76 halftones. 19 line illus.
Cl: 978-0-691-12891-7 \$85.00 | £59.00

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Paul Segall



"This excellent and timely book presents and develops models for earth deformations."

—John W. Rudnicki, Northwestern University

2010. 464 pages. 13 color illus.
1 halftone. 269 line illus.
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Ocean Biogeochemical Dynamics

Jorge L. Sarmiento & Nicolas Gruber

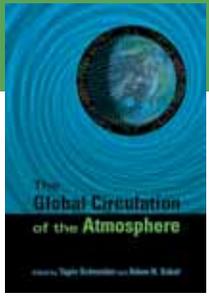
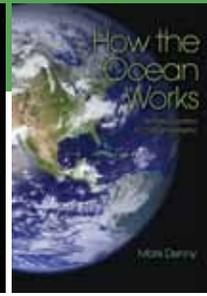
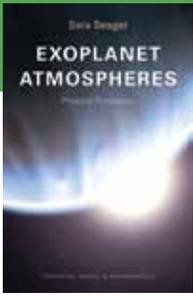
"This textbook is a monumental and masterful achievement."

—David M. Karl, *Bulletin of the American Society for Limnology and Oceanography*

2006. 528 pages. 8 color plates. 102 halftones. 178 line illus. 62 tables.
Cl: 978-0-691-01707-5 \$90.00 | £62.00

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"This book will be a bible for students and professionals interested in exoplanet atmospheres."

—Edwin L. Turner, Princeton University

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Cl: 978-0-691-11914-4 \$95.00 | £65.00

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An Introduction to the Essential Physics Every World Leader Needs to Know

Richard A. Muller

2010. 536 pages. 136 color illus. 13 tables.
Cl: 978-0-691-13504-5 \$65.00 | £44.95

Geophysical Inverse Theory

Robert L. Parker

Princeton Series in Geophysics

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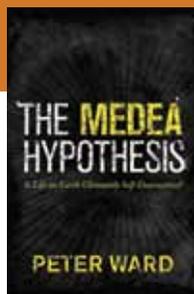
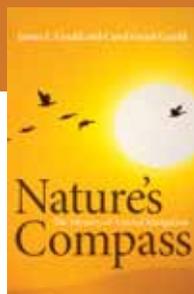
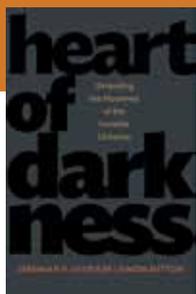
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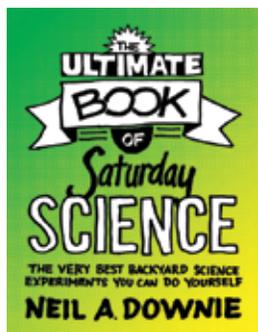
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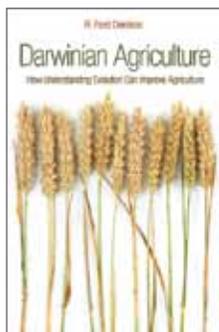
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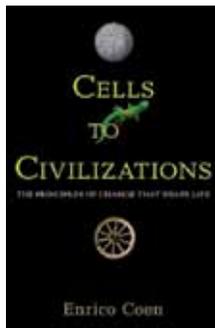
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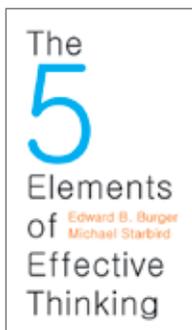
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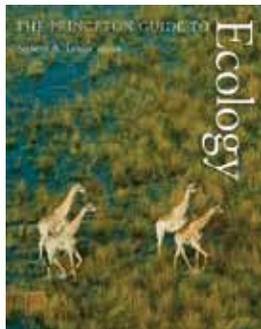
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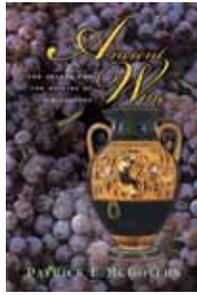
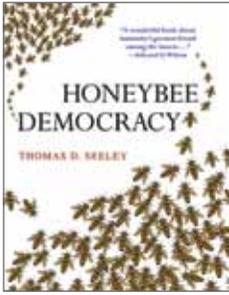
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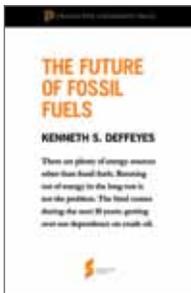
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