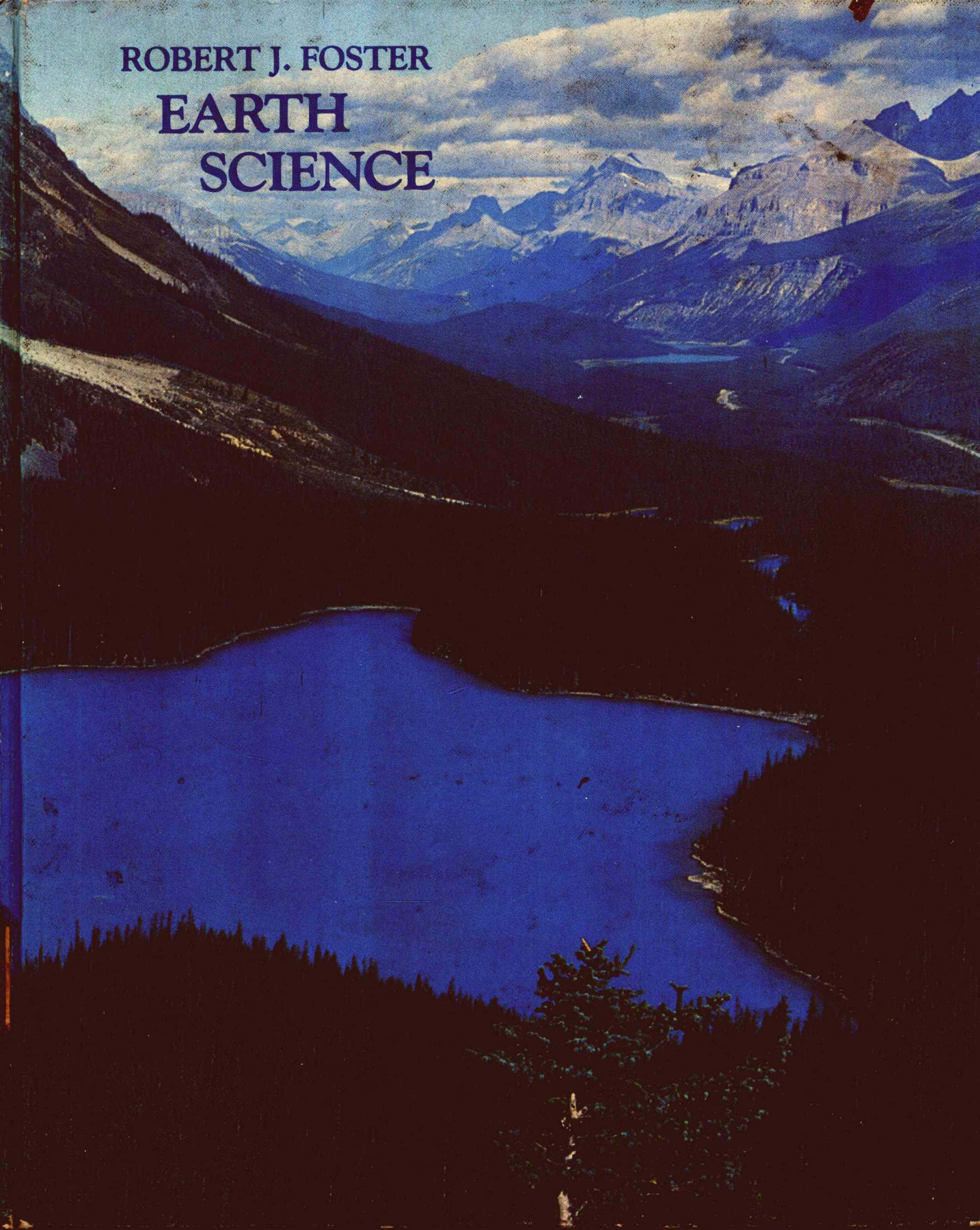
ROBERT J. FOSTER

EARTH SCIENCE



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The Benjamin/Cummings Publishing Company, Inc.
Menlo Park, California • Reading, Massachusetts
London • Amsterdam • Don Mills, Ontario • Sydney

This book was produced by *Ex Libris □Julie Kranhold*
Sponsoring editors *Larry Wilson/Philip Hagopian*
Designers *Dare Porter/Julie Kranhold*
Line illustrations *Ayxa Art*
Color plates and block diagrams *Dennis Tasa, Tasa Graphic Arts, Inc., Minneapolis*
Cover design *Robin Gold*
Cover photograph *James Behnke*

Library of Congress Cataloging in Publication Data
Foster, Robert J. (Robert John), 1929 Apr. 19–
Earth Science.
Bibliography: p.
Includes index.
1. Earth sciences. I. Title.
QD31.2.F67 550 81-21593
ISBN 0-8053-2660-X AACR2
ABCDEFGHIJ-DO-898765432

The Benjamin/Cummings Publishing Company, Inc.
2727 Sand Hill Road
Menlo Park, California 94025

PREFACE

Purpose and Focus

It's the only earth we have, so we had better learn to take care of it. This sentence sums up the urgency for an earth science course. It is the reason more and more students are taking earth science courses to fulfill their science requirement. To understand the earth completely, we study its internal makeup and its surface features, its oceans and its atmosphere, its planetary system and its place in the universe. These aspects of the earth are interconnected, so to learn how the earth works, we focus on broader issues than do separate courses in geology, oceanography, meteorology, and astronomy.

Earth Science is classical in coverage but modern in content. It comprehensively presents the essential facts and details upon which a sound and accurate earth science is based. Although chapters and parts are independent of each other, plate tectonics is an important theme throughout the chapters on geology and oceanography and much of the astronomy (see Plate 6 in Chapter 1). This theme allows a degree of unity among the earth sciences that was not possible until recently. The enormity of time in geology and astronomy provides another degree of continuity. These and several other major ideas are displayed in the extraordinary color plates in Chapter 1, which introduce the student to the relationships among the earth sciences.

Audience

Earth Science was written for liberal arts nonscience students and assumes no science background or mathematical abilities. Simple algebra is used in a few places to clarify rather than obscure relationships. Every effort has been made to make this book appealing and useful to the students.

Organization—Flexible Usage

The overriding concept in the organization of the book has been to make it flexible so that it will meet the needs of students and instructors in a wide variety of courses. The book is divided into four

parts—geology, oceanography, meteorology, and astronomy. Each of these parts can stand alone, so they can be used in any sequence. The chapters within each part can also stand alone and be used in other sequences. Thus, this book is adaptable to earth science courses with a wide variety in content and length.

Chapter 1 outlines the scope of the book through a graphic presentation. The chapter focuses on the chief concepts of the earth sciences and presents them to the student in sixteen easy-to-understand color plates. These illustrations paint a broad picture of large-scale processes, which are detailed later in the text. The plates can be especially valuable if chapters are omitted in some course outlines.

Learning Aids

Earth Science offers many useful learning and study aids. By employing these aids you will use the book to its best advantage. The following features are available:

1. *Chapter outlines* to preview the key contents of each chapter.
2. *Bold-faced terms* to highlight all important definitions and concepts within the text.
3. *Graphics* to illustrate the text material (over 500 photos, block diagrams, and line drawings, including 16 color plates and 8 pages of color photographs).
4. *Metric (English) units* used throughout.
5. *Chapter end materials* to review chapter content:
   - Summary of chapters
   - Key terms (listed in the same sequence as they were introduced)
   - Review questions
   - Suggested readings (featuring recent short articles in popular magazines)
6. *Glossary* for reference to all terms and definitions.
7. *Appendixes* for reference to pertinent background material:
   - Unit systems
   - Mineral identification
   - Topographic maps
   - Relative humidity and dew point tables
   - Star maps

Acknowledgments

Many individuals have reviewed, commented on, and participated in the development of this book. Each part was critiqued by experts in that field, and, while not all criticisms were taken, the reviewing process was indispensable to accuracy, coverage, and consistency. I am

grateful to these colleagues, who indeed care about the quality of contemporary earth science teaching: Lindgren Lin Chyi, The University of Akron; Kenith Exum, Pensacola Junior College, Florida; Marvin L. Ivey, St. Petersburg Junior College, Florida; Eugene Jaworski, Eastern Michigan University; Paul Kirst, Miami Dade Community College, South Campus; David Marczely, Southern Connecticut State University; Charles Stuart, University of Texas, El Paso; Lynn Thompson, Ricks College, Idaho; Tonie A. Toney, Miami Dade Community College, South Campus; Louis Unfer, Southeast Missouri State University; and Ivan Watkins, St. Cloud State University, Minnesota.

The production of a text is complex and involves many creative talents. Julie Kranhold coordinated the production team and organized and directed the design, editing, art, and scheduling. William Waller edited the manuscript. Dennis Tasa illustrated the three-dimensional graphics and created the special color plates in Chapter 1. Ayxa Art developed the two-dimensional line art. Joan Foster created the photo program for the book, including the dramatic chapter openers, and administered the myriad of details of photo collection. She also developed Chapter 1 and most of the art program. Dare Porter designed the book with an open and inviting format. As with most complex endeavors, the production of this book encountered numerous obstacles. I am grateful to this team who not only faced these obstacles, but often provided solutions that were original and creative and always in the spirit of achieving the highest quality.

Larry Wilson was a source of advice, help, and encouragement from the very beginning of this project. The organization and many of the features of this book were developed in discussions with him. Chapter 1 owes much to his vision and encouragement.

Besides her enormous work on the illustrations, Joan Foster supported and influenced the writing of this book in ways that can never be enumerated fully, including typing, editing, proofing, and indexing. She was a critic and companion from its inception to its publication, and this book would not have been completed without her dedication to it.

Robert J. Foster

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