



# Book Reviews

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## FRONTIERS OF SCIENCE



**On The Frontiers of Science: How Scientists See Our Future.** Contributing editors: Nigel Calder and John Newell. 1989. Facts on File, (460 Park Ave. South, New York, NY 10016-7382). 248 pp. Cloth \$35.

If you picked up a book with such an ambitious title, what would you expect to see in the Table of Contents? The sky is obviously the limit, or is it? Certainly not if you are in the realm of space exploration, the subject of the futuristic graphic on the cover of this book. The introductory section on space covers the entire gamut from the pure research of Stephen Hawking's "Theory of Everything" through more traditional astronomy to the ultimate destiny of humankind with Capt. Kirk and Mr. Spock at the helm.

From space, the book moves inward to cover four more earthbound themes: Earth, Body, Mind and Humanity. The first of these, Earth, focuses on how technology has revolutionized the study of ecology, both in space and time. This has resulted in the birth of a fledgling science—"Planet Management." The Earth section concludes with a look at the myriad of possibilities that genetic engineering promises to unfold. This investigation leads naturally into the Body, which includes a discussion of disease, longevity, "fringe" medicine

and how the mind and body may be able to interact to help fight disease. Mind focuses on memory, language and psychiatry, while the concluding theme, Humanity, investigates the limitations of humans and ingenious ways to replace some of our roles with robotics.

One basic observation that I would make about this book is that it is about people and life, with technology woven in. It is not, thank goodness, a glorification of technological fixes to all of life's problems. Though the oft-repeated statement, "Science will have to find new ways to . . .," is frustratingly common, it at least leaves a solid impression of science's limitations. The book is also very readable, with lots of colorful illustrations, and is not just another stuffy, dust gathering reference text.

In addition to the two contributing editors, there are 20 or so contributors and advisers, most of whom are British. This is obviously a U.S. edition of a British publication, and many of the examples used in the book are British or European, although North America is well represented.

This book may be too broad in scope to compete successfully for your personal book budget, especially considering that its lavish presentation makes it fairly pricey. However, it would seem to be an excellent prospect for a library collection.

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## TREES



**A Reunion of Trees. The Discovery of Exotic Plants and Their Introduction into North American and European Landscapes.** By Stephen A. Spongberg. 1990. Harvard University Press (79 Garden St., Cambridge, MA 02138). 270 pp. Hardcover \$35.

Botanical exploration and explorers, introduction of exotic trees and the history of the Arnold Arboretum are the themes of *A Reunion of Trees*. The

book is authoritative and accurate, written by a horticultural taxonomist for the Arnold Arboretum who participated in an expedition to China by invitation of the Chinese Academy of Science.

Wherever explorers went, botanists accompanied them, for each new area of the earth had new trees. These trees could have horticultural or ornamental uses in the Western world.

The subtitle notwithstanding, the subject of *Reunion* is the Arnold Arboretum: its history, botanists and trees. However, the narrow focus does not detract from the effectiveness of the book. The Arnold Arboretum is among the most prestigious arboreta of the world; its directors have been leading horticulturists of the day and its expeditions among the most important.

As he relates the excitement of the botanical explorations, Spongberg describes the notable trees that were discovered. The Bald Cypress, a native of the southeast U.S. wetlands, was the first American tree to be cultivated, and it is on prominent display in the arboretum. The book ends with the recent addition of the Dawn Redwood to the arboretum. This close relative of the Bald Cypress was discovered growing in a remote Chinese forest in 1941. Paradoxically, although restricted to a forest in China that had never been visited by Western botanists, it had a scientific name. How could this be? Seven years earlier it was described from 5 million-year-old fossil remains. When notified of the discovery of this "living fossil," the arboretum financed an expedition to collect seeds, which it then distributed to hundreds of institutions around the world. Now this tree flourishes in public and private gardens.

*Reunion* is a beautiful book, liberally illustrated with photos, reproductions of botanical drawings and maps. The editing is meticulous; the only discrepancy I found was minor (the death date of Andre Michaux is 1803 on p. 43 and 1802 on p. 53).

With the eight-page bibliography and detailed index of personal names and plants, this book serves as a reference

for horticultural history and biography. Furthermore, the map of the Arnold Arboretum on the lining papers, showing the location of each tree, makes this book a guide to the arboretum, as well.

Horticulturists and botanists, amateur and professional, will enjoy reading this history of plant exploration. Concentrating as it does on expeditions to Japan and China in the last century, it whets the appetite for reading further about the fabulous plant explorations of the world.

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## SCIENCE FAIR PROJECTS



**Botany: 49 More Science Fair Projects.** By Robert L. Bonnet and G. Daniel Keen. 1991. TAB Books (Blue Ridge Summit, PA 17294-0850). 144 pp. Paper \$9.95.

Like the earlier *Botany: 49 Science Fair Projects* by the same authors, this book provides science fair project ideas for grades six to nine. After a chapter on science fair project basics, there are chapters on propagation, photosynthesis, hydroponics, stimulation, transport, plant dispersal and fungi/simple plants, each with between 4 and 10 projects.

Although there are some interesting ideas for projects, many appear unlikely to work well, and there is no indication that the suggested projects have been successfully implemented. The book has many major flaws, including factual errors and unclear and incomplete explanations. Examples of errors include saying that iodine is an essential element for plants, that xylem carries waste and that plants exhibit hydrogen deficiency symptoms. A large part of the book is redundant since much material from the first volume is simply repeated here, errors included. If this book is used, be sure to verify the information by checking other references.

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## PLANT TAXONOMY



**Plant Taxonomy: The Systematic Evaluation of Comparative Data.** By Tod F. Stuessy. 1990. Columbia University Press (562 W. 113th St., New York, NY 10025). 514 pp., illustrated. Cloth \$60.

Plant taxonomy (or plant systematics, sometimes used synonymously although the terms are not strictly equivalent) is the field of study of the "theory of plant classification" and includes the methods and principles of classification. The field has undergone great changes in recent years, although classical plant taxonomy, in the mode of Carl Linnaeus, has been around for as long as scientific research has existed. Carl Linnaeus is the best known of the historic plant taxonomists, to whom many of us latter-day plant taxonomists or plant systematists can trace our lineage. Tod Stuessy is one to whom we practicing plant systematists look toward to produce excellent students who will carry on in the field by combining classical methods with modern techniques. In this book Stuessy has presented those subjects that teach his students to become knowledgeable practitioners of plant taxonomy.

Stuessy was an early proponent of the use of cladistics in systematics, but he also presents the two other approaches to biological classification: natural classification and phyletics, and phenetics. These, along with a general discussion of classification, make up the first part of the book, which deals with principles of taxonomy. The second part discusses the mechanics of dealing with taxonomic data derived from morphology, anatomy, embryology, palynology, cytology, genetics, chemistry, reproductive biology and ecology.

The volume includes many illustrations, an extensive bibliography and indexes to authors, taxa and subjects.

The author states in the preface, "This book is designed to introduce the upper-level undergraduate or beginning graduate student to the philosophical and theoretical aspects of plant taxonomy." The book would certainly be useful as a reference text to provide information about some of the classical and modern techniques of plant taxonomy. There are other books emphasizing identification and nomenclature that are available to the beginning undergraduate student in plant taxonomy, but this work provides a broader coverage of the field's theory and philosophy and the systematic techniques advanced students need.

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## ANIMALS—NATURE



**The Moon by Whale Light; and Other Adventures Among Bats, Penguins, Crocodylians, and Whales.** By Diane A. Ackerman. 1991. Random House (New York, NY 10022). 249 pp. Cloth \$20.

We try to understand ourselves and our place in this world by looking at other creatures whose designs and behaviors are shaped and governed by the ineluctable evolutionary forces that determine our form and function. In studying how other animals cope with environmental challenges, we are constrained by the very senses and perceptions which restrict understanding to the parameters of our human dimensions. This is the conundrum that never quite allows closure to our questions, and piques our curiosity about all the peculiar characteristics of the past and present fantastic creatures of our world.

With unrepressed enthusiasm, Diane Ackerman tackles the task of observing, examining, researching, reminiscing and reporting on four different groups of animals—bats, crocodylians, whales and penguins. Attracted by the unknown and challenged to reach out and touch these exotic animals, this award-winning poet and nature writer reflects our very human and secret desire to possess, control and understand the seemingly inaccessible. Ravenous to apprehend the mental and physical nature of these vertebrates, she immerses herself in her study and reports her impressions with great feeling. Library research and the guidance of expert specialists season and modulate these associations into a very readable narrative.

In studying these animals, Ackerman yearns to see into their consciousness and uncover what and how they think. In searching for a window into the animals' minds, she primes all her senses to forge some sort of communication. Where these efforts prove elusive, she continues to seek other perceptual clues. Happily, her experiences with these animals reaffirm their uniqueness, but the message gained from this inaccessibility is that mysteries will continue to haunt and provoke the human observer.

Ackerman writes about little-known animals because of her fascination with life: "There is no animal that isn't fascinating if viewed up close and in detail." Each of the four chapters weaves facts with details of the author's encounters and impressions.