

bolts of gravity wave stress tensors and other such applications of approximate forms of the theory. Such material is abundant in *Gravitation* by Charles W. Misner, Kip S. Thorne, and John A. Wheeler. Indeed, I would recommend *Gravitation* and Steven Weinberg's *Gravitation and Cosmology* as companion references for a course based on Wald's new text.

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Constructing the Universe

David Layzer
313 pp. Scientific American Books
(Freeman), New York, 1985.
ISBN 0-7167-5003-1. \$29.95

Scientific American is an interesting magazine, but reading it is not without frustrations for the average scientist. I have found that I can follow articles in my own field of physics or in the earth sciences, and that I can learn a great deal from them. On the other hand, I long ago gave up even attempting to read articles in molecular biology, because they are written at a level far beyond my ability to follow. My conversations with other working scientists lead me to believe that they have a similar experience. David Layzer's *Constructing the Universe*, a book in the *Scientific American* library, shares the strengths and weaknesses of its parent publication.

As the title suggests, this is a book devoted to an explanation of the evolution of our ideas about the physical universe, with special emphasis on ideas about cosmology and cosmogony. The book is handsomely illustrated and supplied with diagrams in the manner of articles in *Scientific American*. It traces our ideas about the universe from Ptolemy and his Greek contemporaries to modern views of the Big Bang and early universe. The average physicist will, I think, have little trouble following the development of this story. He may also find that much of the historical material is both interesting and new.

In my reading, however, I found that I was continually asking myself the question "for whom is this book intended?" If it is intended as a handbook for working scientists, then the lavish illustrations and four color graphics seem out of place. If it is intended as a book for the average layman—as an introduction to the history of science—then complex mathematical concepts such as vector notation and potential energies also seem out of place. Finally, if it is intended for use as a textbook in an astronomy course, why then are there no problems or discussion ques-

tions at the end of the chapters?

I suspect that the answer to these questions is that the book is intended for the same audience that reads *Scientific American*, or rather, the subset of that audience that reads the physical science articles in *Scientific American*. For that audience this book is ideal—what would bother the average reader will not be worrisome for them. For example, Layzer spends an entire chapter discussing complex philosophical points about the role of scientific theory before he ever presents a single theory for consideration. The book will play the same role as the familiar *Scientific American* to readers—that is, it will serve as a useful reference book, a source of diagrams and illustrations to illustrate difficult points in astronomy, and as a book that will fill in the blanks in what is already a more or less complete education. If you feel the need for this sort of book in your library you could do a lot worse than buying *Constructing the Universe*.

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Polarized Light in Nature

G. P. Können
(translated from the Dutch by G. A. Beerling)
172 pp. Cambridge U. P., New York, 1985.
ISBN 0-521-25862-6. \$32.50

This is a visually attractive book, lavishly illustrated with color photographs, as befits its subject and its apparent intended audience—the intelligent layperson. Alas, upon reading, one soon finds that the text does not live up to the pictures; you can't judge a book by (just) its photographs. The writing style is weak, and in places discursive and repetitive—surely something must have been lost in the translation from the 1980 original.

But the drawbacks are even more fundamental. Many of the explanations are confusing or incomplete, even the more technical ones presented in the last half of the book. Few readers who do not already know the relevant physics will fully understand Können's explanation of the formation of the rainbow and Alexander's dark band, for instance, or even his explanation of polarization itself. [For atmospheric optics, readers should stick with Robert Greenler's *Rainbows, Halos and Glories* (Cambridge U. P., 1980).] Several times an "explanation" consists instead merely of a description, as for the Zeeman effect. Some phenomena are mentioned but not explained at all: Why is light from artificial satellites polarized as much as 40%?

For a book that is "the first attempt to compile a guide to polarization" (as claimed in the introduction), the refer-

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