even the simplest formal manipulations. If one strips away the historical component that is the main "cultural" feature of these books, one is left with a text whose whole style is expressive of the mind set of a professional physicist. Thus, for example, we are told that "the phase of any wave is the argument in the functional form of the wave." I would be very surprised indeed if this had much to say to the liberal arts student, who ought, in my opinion, to be wooed with phenomenology—not formalism.

And what of the historical component, of which the creators of the course are clearly very proud? I feel torn in commenting on this aspect. On the one hand, I do believe that an appreciation of the historical origins of our present understanding of physics is greatly to be desired as giving insight into the *process* by which scientific knowledge is advanced. On the other hand, my own teaching experience has driven me to the reluctant conclusion that few students at the introductory level are particularly motivated by this; their interest (understandably) is primarily in *what* we currently know or believe, never mind how we have come to know it. (Also, will the history ever be on the exams? Students, as we all know, are realists.) However, if one concedes that the injection of history is worth attempting, one is also entitled to demand that the history itself be reliable. Unfortunately there are numerous instances (especially in volume 1) where *The Mechanical Universe* falls short in this respect. (I will not take space here to give specifics.)

The physics in these texts is, as one would expect, generally accurate. Even here, however, there are surprising lapses. A detailed discussion of fluid resistance is based entirely on a viscous force proportional to v—even for "cannonballs speeding through the air." (Only a brief footnote in the advanced edition counters this major error.) And the treatment of the work–energy theorem, with the attribution of potential energy to a single body, not to a system, is in my opinion misleading if not actually wrong.

I concede that such errors of detail, both historical and physical, could be corrected without too much trouble. My main criticism, as stated earlier, is that it is almost impossible for me to visualize these books achieving their intended purpose. The advanced version of the text would, I think, be more effective (but also relatively traditional) if one removed most of the history. But the elementary version, which clearly represents the main thrust of the whole enterprise, seems to me so mismatched to its prospective users that only a complete revision would remedy the situation. I should of course be delighted to be proved wrong; it is no pleasure to reach such a conclusion, especially when one knows how much energy, enthusiasm and talent have gone into this ambitious project. One feature, at least, is beyond dispute: Cambridge University Press has done a beautiful job in the design and production of these books.

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BOOK NOTE

Satellites

Edited by Joseph A. Burns and Mildred S. Matthews
U. of Arizona P., Tucson, 1986. 1021 pp. $55.00 hc
ISBN 0-8165-0983-2

Under the general editorial direction of Tom Gehrels, 13 books have now been published in the University of Arizona's highly acclaimed Space Science Series. These books, which are not conference proceedings, are well edited as complete books (each contribution was sent to at least two reviewers) and are free of jarring typographical variations. *Satellites* is based on International Astronomical Union Colloquium 77, held at Cornell University in July 1983, but the effective date of the book is late 1985. References do not appear at the ends of individual contributions, but are given in a 60-page bibliography that includes the titles of referenced papers. The book includes a glossary of terms, color plates, maps of individual satellites and several tables of reference data. The substance and length of the 18 chapters, typically 50–60 pages, together with the firm editorial control make this book, as is true for the others in the series, a valuable reference monograph on what is significant in planetary-satellite space science. The subjects include orbital resonances, tectonics of icy satellites and cratering of planetary satellites. A final bonus is the reasonable price.

—PER H. ANDERSEN

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