research in an area where controlled experiments are ruled out by ethical considerations.

On the whole, this book does an admirable job of dispelling some of the popular mythology surrounding science and scientists. One myth, however, is retained. This is the claim that only the birth of modern science freed the human mind from the shackles of slavish devotion to the authority of the written word. Historians of science have long since put to rest this bit of Enlightenment propaganda.

Though written as a conventional college textbook, this book should probably not be employed in a large lecture course. It needs a sensitive and broad-minded instructor working in a more Socratic setting. Thus it may be difficult to fit it into the curriculum of our major research universities, where the ills it seeks to cure are most rampant.

ROBERT H. MARCH
University of Wisconsin-Madison

Theory of Nuclear Structure

M. K. Pal
676 pp. Van Nostrand Reinhold, New York, 1983. $37.50

Manoj Kumar Pal is a well-known nuclear-structure theorist from the Saha Institute in India. This work, which he has intended as a text at the master's level, covers some basic topics in nuclear theory, starting with a good and detailed discussion of the two-nucleon problem. This is followed by a chapter on the Brueckner theory for nuclear binding energies, then discussions of nuclear models—the shell model, collective model, Hartree-Fock approximation, pairing theory and vibrational states. There are several problems at the end of each chapter.

Although the book contains a lot of interesting material, which I will soon get to, there are unfortunately some disappointments. The most obvious of these is that the author has made no attempt to keep the book up to date. With the noticeable exception of the discussion of work around 1975 on backbending, the physics in this book is limited to work of the 1950s and 1960s. Important developments in the 1970s, such as double-humped fission, the interacting-boson aproximation, the statistical methods of J. Bruce French, or even examples of large shell-model calculations are omitted.

Even the figures are old. Again, except for the backbending figures of 1975, all others are from the 1950s and 1960s. Some major omissions and the absence of concrete examples are also disappointing. For example, I expected much more of the chapter on the shell model. There is no mention of spectroscopic factors in transfer reactions, although they played an absolutely vital role in the development of nuclear structure. Beta decay, isobaric analogue states and Phillip Elliott's SU(3) scheme are all omitted. There are no examples of results of medium or large shell-model calculations, many of which have been extremely sucessful in correlating a wide variety of experimental data.

Also there is no mention of the fact that such calculations in large spaces often display a collective character, yielding, for example, spectra that greatly resemble rotational bands. Thus the author misses an opportunity to draw a connection between this chapter and the following one on the unified model. In general this chapter follows but does not take us much beyond the previous work of Amos DeShalit and Igal Talmi, *Nuclear Shell Model*, published in 1963.

The chapter on the many-body theory is good in the sense that it goes carefully through the many calculations done in the 1960s, and the serious student will appreciate the details of the different approximate methods by different groups. But an overview is lacking. For example, how viable is the approximation of setting the effective mass of the particles equal to one and of the holes considerably less than one? We are not told. There is, though, a good critique of the Scott–Moszkowski method. Near the end of this chapter the Kuo–Brown matrix elements are mentioned, but not in enough detail for the student to understand what they are all about. It would have been nice to show an example of a two-particle spectrum—for example, Po^{210}—in which the spectrum is collapsed if the "bare" G matrix is used, but nicely spread out when the core polarization corrections are included.

Theory of Nuclear Structure has several strengths, too. The formalisms are presented in considerable detail and the formulas are written clearly and accurately. This book is extremely useful to a prospective PhD student in nuclear theory faced with the problem of learning a great deal of material in a short period of time, just to get to the point where he can begin his thesis. The material presented is basic and important. Some topics are included that one does not often see elsewhere. I was happy to see discussions of semi-infinite nuclear matter in the chapter on many-body theory, and of approximate methods of angular-momentum projection in the chapter on microscopic theory of nuclear structure. The sections on pairing and the Hartree–Fock approximation are good, and concerning the latter, it is nice to see an extensive discussion of the work of Levinson and coworkers in the s–d shell.

I would not hesitate to recommend this book to prospective PhD students in nuclear physics. I would probably use this book as a reference text if I were to teach a course in nuclear physics in the near future. But I would have to supplement the text with concrete examples and updates from the journals.

Larry Zamick
Rutgers University

Relativity and Engineering

J. Van Bladel

402 pp. Springer-Verlag, New York, 1984. $29.00

This textbook on relativity is a "no-nonsense engineering" approach to the subject. And, I might add, it is a delight to have such a treatment of what others