MAGNETIC RESONANCE IMAGING: PRINCIPLES AND APPLICATIONS.
D. Kean, M. Smith. Baltimore, Williams and Wilkins, 1986, 164 pp, $43.95

This 164-page book by two individuals well known in magnetic resonance (MR) imaging is intended as an introductory text on the subject. The first six chapters deal with theory of nuclear magnetic resonance (NMR) and MR imaging, as well as imaging hardware and "practical aspects" of imaging, such as safety hazards and claustrophobia. The last four chapters cover applications of MR imaging in a variety of clinical areas.

As noted in the foreword to this slim volume, the rapid growth of MR imaging in clinical medicine has created a need for "basic texts ... which provide an introduction of the background techniques, applicability and limitations of ... MR imaging ... and which will not intimidate the newcomer." The task of preparing a readily understandable text that will fill this need is made difficult by the size and complexity of the subject to be covered: success requires particular care and thoughtfulness. I believe the authors of this book have fallen short of the mark.

The chapters dealing with theory and hardware have some strengths. For example, the authors present a particularly clear explanation of the classic mechanical model of NMR. However, the presentation overall is less effective than one might hope, certainly less effective than others I have seen. One troubling aspect is that esoteric issues are gratuitously raised and then dealt with in a very superficial manner, bound to result in confusion among those not already familiar with the subject. For example, the authors point out that an inadequate sampling rate when digitizing analog NMR signals results in signal distortion. However, what determines adequacy of the sampling rate is not explained, nor are the effects of undersampling of MR images presented. In fact, the whole subject is covered with three sentences and one figure. Clearly, it would have been better left unmentioned, especially since it is probably too recondite for the purported goals of the book.

Other topics of great importance in clinical MR imaging are dealt with very poorly. For example, the effects of blood flow on MR images is treated so superficially that the discussion is misleading. The complexity of the grey scale of inversion recovery images and its dependence on the method of image reconstruction is not even mentioned, let alone explained. Terms such as aliasing are introduced without being defined. The net effect is to leave the uninitiated reader confused, frustrated and incompletely informed regarding concepts important to clinical MR imaging.

The book chapters dealing with clinical applications are particularly disappointing. They are dominated by platitudes rather than concrete, clinically useful information. Images are not consistently referenced in the text. They are poorly annotated, generally lacking arrows or other indicators of important anatomical structures. The captions frequently fail to indicate the imaging parameters used (TE, TR, TI) or even the reason the image is being shown. The histology of lesions generally is not indicated. In sum, although this book is not entirely without value, I cannot recommend it above others as a useful introduction to MR imaging.

DAVID A. TURNER
Rush-Presbyterian-St. Luke's Medical Center
Chicago, Illinois

TABLE OF RADIOACTIVE ISOTOPES.

At first sight this large volume (8½ × 11 in.) appears to be the eighth edition of the Table of Isotopes by the same authors from the same institution, Lawrence Berkeley Laboratory, University of California; but no, this is a completely new edition. The reason for this is that the authors have presented the nuclear decay data in a new way. Throughout the book, experimental radiation data have been evaluated and the resulting "best" energies and intensities have been reported in tabular form. The book is organized by mass number (A) with entries for a given A derived from and referenced to the most recent corresponding evaluation in nuclear data sheets or nuclear physics. Included is a mass-chain decay scheme for each isotopic mass number showing some of the properties of the radioisotopes and the decay relationships between them. Following these schemes are tables for every isotope, the first of which gives the isotope's atomic number, mass number, element symbol, half-life, decay modes and branchings, mass excess, specific activity, means of production, and natural isotopic abundance. Subsequent tables list the isotope's nuclear and atomic radiations, and include total average energies per disintegration wherever possible.

Appendices of interest to users of radioactivity follow the main section of the book. These include graphs and tables pertaining to the following: fundamental constants and conversion factors, standard gamma-ray and alpha particle energies and intensities for detector calibration, theoretical internal conversion coefficients, electron capture subshell ratios, electron binding energies, atomic fluorescence, and Coster-Kronig yields, x-ray energies and intensities, Auger-electron intensities, absorption of gamma rays and ranges and stopping powers of charged particles in matter, positron decay branchings, average radiation energies per disintegration, and physical properties of the elements.

This makes an extremely useful book tailored to the needs of applied users in industry, biology, medicine and other fields, but serves also as an indispensable reference for nuclear physicists and chemists. Detailed radiation data for about 2,000 of the 2,755 known nuclides are presented in this up to date and concise single volume. This reviewer notes with approval the use of the words radioactive isotopes in the title rather than the word radionuclides, which is often misused.

ROY S. TILBURY
University of Texas
M.D. Anderson Hospital
Houston, Texas

140 Book Reviews The Journal of Nuclear Medicine