In "American Acceptance of Nuclear Power," philosopher William Barrett reviews the causes of the current "malaise" in public attitudes toward technology. Barrett blames this on the perceived failure of technology to solve society's ills, particularly the spiritual and moral ones. He sees modern antinuclear activism as part of a spiritual and moral crusade against technology and as the cause of spiritual and moral disorder in our society. Barrett responds to this premise by holding that technology, including nuclear, is spiritually and morally neutral, with import depending only on the use to which it is put. Barrett advocates that the proponents of technology strike a middle ground and not oversell its potential. He also recommends that there be a better identification and separation of those problems that do and those that do not have technological solutions.

In the final essay, "The Nuclear 'Genie': Beyond Faust, Fate, and Incantations," prepared by philosopher Margaret Maxey, the target is "soft technology," or, perhaps more accurately, the contention that soft technologies such as solar, are ethically more acceptable than nuclear power. The basis of this contention is that development of nuclear technology would commit future generations to risks not of their own choosing. Maxey counters with opposing ethical arguments, noting the many deficiencies of current and foreseeable solar technology, and that reliance on unproven solar prospects may commit future generations to deprivation. She also notes that concerns over long-range nuclear waste disposal problems are out of proportion to the actual risks involved. She proposes that such risks can ethically be ignored when they become smaller than natural risks of the same type, e.g., background radiation levels, or concentrations of radioactive and other toxic elements in natural ore bodies. This concept is also relevant to ALARA and other current regulatory issues.

The medical radiation community is involved in current public controversies over radiation and its effects. Recent examples include the virtual stoppage of mammographic screening and the closure of low-level waste disposal sites in the late 1970s, due to public and political concerns over low-level radiation. Although this book deals with nuclear power and the nontechnical aspects of the nuclear power debate, there is substantial overlapping of the issues (and personalities) involved in medical radiation controversies. For this reason, a book such as this one should be of interest to the medical radiation community. It is a small, inexpensive book, very suitable for reading while traveling or at quiet moments "away from the office." Readers with a taste for philosophic discussion will find this a particularly stimulating and challenging book.

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THE SYNTHESIS OF CARBON-11, FLUORINE-18, AND NITROGEN-13 LABELED RADIOTRACERS FOR BIOMEDICAL APPLICATIONS. J. S. Fowler, A. P. Wolf. Nuclear Sciences Series (Report No. NAS-NS-3201), Springfield, VA. Technical Information Center, U.S. Department of Energy, 1982, 124 pp, $11.25

This monograph, the first in a new series on radionuclides in nuclear medicine, deals with general concepts and methods on the synthesis of positron-emitting labeled radiotracers. The stated objective of this work is "to treat the topic (carbon-11, nitrogen-13, fluorine-18 labeled radiotracers) principally from the standpoint of synthetic organic chemistry." The authors have organized the information into seven sections: "Introduction," "Radiotracer Design," "Radiotracer Synthesis," "Carbon-11," "Fluorine-18," "Nitrogen-13," "Experimental Design and Related Technology," and two appendices. These are combined with both significant and recent references along with a subject index. Most of this material is found dispersed in many reviews, and the creation of a self-contained volume seems appropriate at this time.

The sections on "Radiotracer Design" and "Radiotracer Synthesis" are concerned with the choice and positions of labels, synthetic strategies, reagents, radiotracer purification, and optimization of reaction rates. The emphasis is not so much on fundamental principles, but rather on the practical aspects of positron-emitting radionuclide chemistry. This section offers an abundant source of advice on problems that chemists frequently face during their work, and could be useful for graduate students who are learning about this chemistry, methods, and analytical techniques. Furthermore, these sections are of interest to investigators because they approach problems; e.g., noncarrier added, carried added, carrier free, etc., that have confused many workers in this field for a long time.

The sections on "Carbon-11," "Nitrogen-13," and particularly "Fluorine-8," admirably reveal the existing complexities of the chemistry with positron-emitting labeled radiotracers, and are a valuable source of information on the synthesis of these compounds.

The section on "Experimental Design and Related Technology" is heavy on practical applications, e.g., ion chamber and well counter callibration, radioactivity monitoring during synthesis, and shielded work areas. Also included are recipes taken from the literature for the preparation of selected positron-emitting labeled radiopharmaceuticals.

Anyone involved in research in nuclear medicine, and particularly in positron emission tomography, will find this concisely written book well worth reading, since it offers an overview of what the synthesis of carbon-11, fluorine-18, and nitrogen-13 radiotracers entails, and points out the material that must be understood to gain insight into the field.

Perhaps the chief value of this monograph is that it includes in one short volume an extensive, rather than exhaustive, review of the literature complemented by a pleasing number of tables, formulas and references (almost 500). The sections are well organized and written at a level readily understood even by workers in related fields.

In summary, this modestly priced volume is a useful reference book for researchers, and is highly recommended for both the novice and the expert.

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RECENT ADVANCES IN BRACHYTHERAPY PHYSICS. AAPM. Monograph No. 7, D. R. Shearer, Ed. New York, American Institute of Physics, 1981, 202 pp, $50.00

This volume contains the proceedings of an American Association of Physicists in Medicine workshop held in Sturbridge, Massachusetts, in October, 1979. Despite the delay in publication of this volume, it contains a great deal of up-to-date information on the practice of brachytherapy physics and some of the medical reasons for the resurgence of interest in this important mode of therapy. The ability to control tumors is limited principally by the radiation tolerance levels of the surrounding normal tissues. These tissues are necessarily included in both external beam treatment ports and implant therapy, but in the case of implants a much higher dose can be delivered to a large portion of the tumor for a given dose to normal tissues. In an era when micrometastases are becoming more easily controlled with systemic agents, the local control of more advanced bulky tumors is becoming more important. Brachytherapy offers a real improvement on the control of such tumors.

This monograph provides much of the background and technical information needed by the medical physicist to understand and practice the intricacies of implant dose calculations, source standardization, and radiation safety. The invited lecturers were chosen

from the most knowledgeable physicists, all of whom have worked extensively in this area, and their presentations are written in sufficient detail and clarity to be easily used by a physicist trained in general medical physics.

Physicians will not choose to follow these manuscripts in detail, but physicists and medical radiation safety personnel will want to study every page, discussions included.

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NMR IMAGING. PROCEEDINGS OF AN INTERNATIONAL SYMPOSIUM RESONANCE IMAGING. R. L. Witcoski, N. Karstaedt, C. L. Partain, Eds. Winston-Salem, NC, Bowman Gray School of Medicine, 1982, 201 pp, $15

Twenty-seven articles with extensive references provide a broad, accurate, and complete presentation of the subject. The "Introduction to NMR" by Moore, Wilcott et al., and Gore provides a brief, but clear explanation of basic NMR principles, NMR spectroscopy, and relaxation effects. These articles are as timely now as when the talks were presented and, unlike some recent works, are technically accurate and correct. Articles on "Technological Considerations" by Bottomley, Hoult, and Hanley constitute a comprehensive description of instrumental details and techniques. Excellent diagrams and sufficient equations provide the medical physicist with a solid introduction to the field of NMR imaging. The discussion of superconducting and resistive magnets by Hanley is of particular value, although the cost figures are out-of-date. Detailed discussions of "Imaging Methods," including a critical evaluation of various methods by Mansfield, a description of options by Young et al., the spin warp method by Hutchinson, and real-time moving images by Ordidge et al. cover all the currently used techniques. Mansfield's discussion of the time required to obtain an image compared with its information content and Young et al.'s discussion of the information obtained by different pulse techniques are both excellent and should be required reading for anyone entering the field. The discussion of "Biological Hazards of NMR" by Saunders is extremely valuable, providing facts and figures documenting the apparent safety of the technique as presently used and how the electromagnetic fields (and their possible effects) associated with clinical imaging differ from those associated with other medical or occupational exposures. Budinger presents an excellent comparison of NMR imaging with other techniques. His predictions of the rate at which NMRI will be established as having diagnostic value appear in retrospect to be quite conservative.

A quarter of this book is devoted to discussions of "Protocols and Imaging Results" from virtually every laboratory that had an operating imager at the time of this symposium. Although the quality of images presented and the quantity of data available have improved by almost an order of magnitude since this work was published, it still constitutes one of the most concise and complete presentations of clinical results (albiet preliminary) available. As such, it provides the clinician with a quick, single source introduction to the field. Of particular value are the numerous tables of T1 and T2 values for various tissues and examples of the advantages and difficiencies of using different pulse sequences and imaging modalities for different tissues and pathologies.

In general, the potential opportunities indicated have been amply confirmed in recent years, and the predictions appear in retrospect quite conservative. The last fifth of the book is (or was) a look at future prospects including imaging with other nuclei, metabolic/spectroscopic imaging and localized spectroscopy, flow imaging, and cardiac imaging. Major advances have occurred in all of these areas since publication of this work.

In summary, while specific details may be a bit dated in this rapidly developing field, this work provides a breadth of coverage of uniformly high quality that makes it a valuable addition to the library of anyone entering the field of NMR imaging for several years to come.

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PHARMACOANGIOGRAPHY IN THE DIAGNOSIS OF TUMOURS. Gy Vargha, Akadémiai Kiadó, Budapest, Hungary, 1981, 240 pp, $37.00, illustrated

For the past 20 yr, angiographers have used pharmacologic agents to improve flow in an arterial bed or to enhance opacification of a disease process such as a tumor or infection. In the first situation we continue to use vasodilators and vasoconstrictors in a variety of areas of peripheral vascular and cardiac angiography. In the second group of diseases the utilization of pharmacologic agents has decreased dramatically along with the decline in visceral angiography secondary to the advancements in computerized tomography (TCT) and ultrasound. Therefore, a portion of this book is somewhat dated.

The authors present a very thorough investigation using both animal models and patients. The specific areas included are pharmacoangiography of the kidney, bone, joint and soft tissue tumors, and some application to the stomach and bronchial arteries. There are many illustrations of good quality with helpful legends. The tables and graphs are also very thorough and allow easy references. At times the translation (from Hungarian) is slightly awkward, but this does not detract from the text.

The individual chapter format is very good in its organization. The beginning reviews the historical aspects. Next is a discussion of the animal experiments, which is then followed by a description of their experience with patients, and finally an excellent summary is presented. In addition, the final chapter contains a total summary of the observations.

For myself (an angiographer) I found the book to be informative. Although much of the material pertaining to patient utilization is provided in other angiographic texts, there are some facets of pharmacoangiography that are much more completely covered in this book. I commend the authors for their exhaustive efforts. This is a scholarly work that provides a reference source for an important adjunct to angiography and should be included in medical institution and radiology department libraries. This is not a book for general medical readership because it is directed toward the angiographer.

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