**QUANTITATIVE METHODS IN BONE DENSITOMETRY.**
*A.L. Huddleston. Boston/Dordrecht/London, Kluwer Academic Publishers, 1988, 217 pp, $90.00*

This book is an informative introduction into the field of bone densitometry. It covers, in a very readable form, basic principles, methodology, and clinical application of many different techniques from the early years of x-ray-based densitometry to state-of-the-art quantitative computed tomography and dual photon absorptiometry. The book is written for physicians, scientists, engineers, and medical physicists, but anyone interested in bone densitometry should consider reading it.

In different chapters, the book covers radiographic film methods, single photon absorptiometry, dual photon absorptiometry, quantitative computed tomography, scattering methods, and activation analysis. A final chapter on clinical applications and comparison of methods serves as a helpful guide to sort out the clinically useful procedures for contemporary medical practice. All chapters are illustrated with original figures from the literature which helps establish familiarity with the true contributions to the field. A short introduction describes the composition of bone tissue and perhaps too briefly refers to the relationship between bone mass and bone strength. An examination of this relationship is most important when bone mineral measurements are used in predicting fracture risk.

The chapters are well researched. The book contains 469 references which are well integrated into the text and not just annotated. The newcomer to the field of bone densitometry will discover the long history of efforts to quantitate bone mass in vivo, the large number of investigators who have been in the past or are at present involved in bone densitometry, and will learn how our understanding of bone physiology and pathology has been influenced by these efforts.

The author himself is well known for his work in bone density measurements by a Compton-scatter method and this makes him able to convey to the reader a sense of the underlying objectives, and of the often frustrated hopes in the use of these techniques.

This overview was finished before dual energy x-ray absorptiometry became available and this method, an outgrowth of dual energy absorptiometry based on isotope sources, is not reviewed.

The book fills a gap in the literature on bone densitometry, since similar overviews such as the classic review by Cohn in the CRC series are at least 10 years old, which is a long time in a fast moving field as bone densitometry. The price of $90 was disappointing.

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**NCRP REPORT NO. 101, EXPOSURE OF THE U.S. POPULATION FROM OCCUPATIONAL RADIATION.**
*Maryland, National Council on Radiation Protection and Measurements, 1989, 106 pp, $15.00*

This is the report of one of the five radiation dose assessment committees of the NCRP whose combined summary was presented in NCRP Report No. 93, Ionizing Radiation Exposure of the Population of the United States. Although an early draft of this was used for Report No. 93, the general information and conclusions in the summary are still valid, only the data in this report are more current. The report consists of five chapters and a glossary.

Chapter 1 introduces the objectives of this literature review on occupational exposures and defines the scope of the populations studied and the limitations of personnel dosimetry data. The goal is to determine average annual effective dose equivalents and collective effective dose equivalents for the U.S. work force. Eleven major work categories, many with several subcategories, are defined.

Chapter 2, "Personnel Dosimetry," reviews seven reasons for monitoring personnel and the methods and uncertainties of these measurements. Recognizing that there are many variables that introduce uncertainty in the assessment of effective dose equivalent from a personnel dosimeter, the report still notes that compared to other hazards in the work place, radiation is probably the best characterized and measured. It is also recognized that the internal effective dose equivalent has much higher uncertainty than the external, but that for most of the occupations studied it is likely to be trivial in comparison.

Summaries of dose equivalents by occupation are described in Chapter 3, the major component of this report. The primary sources of personnel dosimetry data readily available are those of NRC licenses and federal facilities and their contractors. These include occupations associated with nuclear power production, DOE laboratories, those monitored by the U.S. Public Health Service, and medical licenses in nonagreement states. There are some excellent summary tables on numbers of exposed, average annual dose equivalents, and cumulative dose equivalent from an EPA report in 1984. Also, because of NRC reporting requirements, there are more data available on nuclear power plants than any other occupational category. From the EPA report it is noted that between 1960 and 1985 the mean annual dose equivalent for monitored workers declined or remained constant whereas the collective dose equivalent increased. Even so, this collective dose equivalent is trivial compared to that from background radiation.

The section on medical occupational exposure was disappointingly brief, due to incomplete data because agreement states in general don't require annual reports like the NRC. The data do show, however, that whereas the number of monitored medical workers has increased by 46% between 1970 and 1980, and 93% since 1960, the mean annual dose equivalent has decreased by 42% and 63%, respectively. The cumulative dose equivalent has decreased by 18% and 29% over these same time periods.