

was available at the symposium. However, although this would have added greatly to the usefulness of the book, it would undoubtedly increase its cost considerably. Although some of the material has appeared elsewhere in the literature, it is of undoubted advantage to have it brought up to date and collated conveniently in two volumes.

The work reported is of a consistently high standard and provides a good cross section of current progress in the neutron field in many laboratories situated throughout the world. The scientist working with neutrons should find much to interest him whether or not he is actively concerned with neutron dosimetry.

E. J. AXTON

Radioactive Isotopes in Instrumentation and Control, N. N. SHUMILOVSKI and L. V. MEL'TSER (Translated by R. F. KELLEHER), International Series of Monographs on Nuclear Energy, Pergamon Press, 1964. xiv + 198 pp., 70s.

THIS is a translation of a book originally published in Russia in 1959 as a textbook constituting 'a logical exposition of the general theory of instruments incorporating radioactive sources'. The preface suggests that 'the lack of suitable textbooks . . . often leads in practice to the use of a blind, empirical approach to the solution of problems'. Both authors are from the Institute of Automatics and Telemechanics of the U.S.S.R. Academy of Sciences and are already well-known for publications in the field of nucleonics.

Instrument engineers may thus be led to expect a background of sound principles on which to base their practical designs. The book presents at the same time something more and something less than this.

The introductory chapter, 'only incorporated in order to complete the logical formulation', nevertheless occupies more than a quarter of the text in dealing with the principles of Nuclear Radiation, Radiation Detectors, Modulation of Nuclear Rays (mainly mechanical), Measuring Circuits and Errors. Its opening section on Nuclear Radiation is frankly inadequate and in part misleading and the reader would be well advised to seek this information elsewhere. The account of radiation detectors also tends to be oversimplified, but does give some data on the operating characteristics of Geiger, scintillation and slow neutron counters used in the U.S.S.R. Measuring circuits are described only schematically, but a good account is given of the principles of compensation methods characteristic of Russian nucleonic instrument design.

The remainder of the text is divided into eight chapters, which deal in turn with the main types of instruments for thickness measurement, level detection, flow measurement in liquid and gases, gas pressure measurement and composition gauging and a ninth and final chapter on the choice of source activity.

Although the principles of each type of instrument are briefly outlined, this, the main body of the book is mainly concerned with mathematical computations relating theoretical performance to the parameters of the systems described.

It must be admitted that this could be described as a 'logical exposition of the general theory', but some of the expressions derived are extremely complex and as such hardly likely to appeal to practising instrument engineers. There is also little to distinguish important from less important aspects of performance, so that the reader is sometimes at pains to see the wood for the trees.

The lack of concern for instrumental difficulties in putting attractive theories into practice is exemplified by parts of Chapter 8, on 'Composition control' and particularly by the account of the 'Frequency Method' (which, incidentally needs a computer to operate it) and the reader is forced to the conclusion that a modicum of enlightened empiricism may not be so undesirable after all.

Diligent readers will find a number of interesting ideas in this book, some only of which are well-tryed, but instrument engineers may consider its approach impractical.

J. L. PUTMAN

Clinical Aspects of Iodine Metabolism, E. J. WAYNE, D. A. KOUTRAS and W. D. ALEXANDER, Blackwell, Oxford, 1964. pp. XIV + 303. 45s.

Clinical Aspects of Iodine Metabolism is a very good summary of current quantitative and qualitative knowledge of iodine metabolism in man, both from the literature and also very extensively from much recent work on this subject done at Glasgow. During the last twenty years research on human iodine metabolism has been extended very considerably, firstly in terms of, and with the use and very sensitive measurement of, the radioactive isotopes of iodine, secondly and more recently this has led to the development of better chemical methods of stable iodine assay. Professor Wayne and his collaborators show in this book how effectively they have used chemical and radioactive methods of measurement in combination, to obtain more information than can be ascertained by either method on its own.

The book is divided into two main parts, dealing firstly with normal iodine metabolism and secondly with "pathological aspects of iodine metabolism" (should this not be 'aspects of pathological iodine metabolism'?). The first part is comprehensive and includes chapters on iodine sources and requirements as well as on metabolism itself. It is sufficiently detailed to include, for instance, what is known of iodine secretion in sweat and in the stomach. There is a very good summary of what is known regarding radiation hazards. A purist might criticize the footnote on page 34 describing radiation units; the rad is easily defined and more appropriate to use for radioiodine than the roentgen and the rem is at present of little practical use. The second part is divided into chapters describing iodine metabolism in different varieties of thyroid disease, with the addition of individual chapters on goitrogens and on diagnosis. A chapter has been allocated to each of the more uncommon types of disease and there are thus a two-page chapter on subacute thyroiditis and three pages on carcinoma. The literature is more heavily used in some of part two, but much personal work by the authors is included, as in part one. Here, as elsewhere in the book, it is very pleasant to find numerical data presented so well, both as tables and as diagrams, complete with standard deviations and with correlations when possible. Obviously iodine metabolism is still the main topic covered, brief outlines only are given of other clinical aspects such as treatment. It is interesting to read the authors' views on the nomenclature and classification of

hyperthyroidism. They put forward good arguments for using the word 'thyrotoxicosis' for most varieties, reserving 'toxic adenoma' for TSH independent nodules and 'endocrine exophthalmos' for cases with the Graves' disease type of exophthalmos without hypermetabolism. Certainly the distinction between diffuse and nodular toxic goitre is difficult clinically and in some senses has little meaning but it seems rather defeatist to give it up altogether.

One of the particularly good features of this book is the full detail given of technical procedures both in the text and also in the first of the appendices, entitled *Methods*. Two further appendices list iodine-containing drugs (by proprietary names) and goitrogens and other substances interfering with tests of thyroid function (by a mixture of proprietary, chemical and official names) with references. There is an extremely good 46-page list of references, with titles of papers included, and an adequate index. There are very few obvious mistakes or misprints. Lines 12 and 13 on page 223 read rather oddly. The index gives page 210 instead of 209 for 'pregnancy and thyroid function'. On page 260 line 10, HALE³ appears instead of HALES.

In summary, this is a very useful book which gives much important fundamental information. It should be in the hands not only of physicians interested in thyroid disease, but also of radiotherapists, physicists and clinical pathologists concerned with diagnostic and therapeutic use of radioiodine.

K. E. HALNAN