

electronician specialized in the construction of equipment of one particular kind.

Out of the 39 papers given in this publication, 26 have been written in French by scientists working on the program of French atomic energy. This implies that more than half of the described systems and equipment are of French conception.

It is unfortunate that the proceedings of this symposium which took place in 1958 have only been published at the end of 1959. The growing development of this particular field makes such a book rapidly out-dated.

ALAIN L. COLOMB
Oak Ridge National Laboratory
Oak Ridge, Tennessee

(Editor's Note: Dr. Murray's principal interests are nuclear radiation detectors and the physics of solids.)

Radiations and Matter. By ANDRÉ BERTHELOT. Leonard Hill Books, Ltd., London, 1958. \$5.75. (Translated by F. R. Paulsen from the French, *Rayonnements de Particules Atomiques, Electrons et Photons*. 180 pp., 103 Figs.)

This rather compact book dealing with the interaction of gamma rays and charged particles in matter originated as a series of lectures delivered to physics students at the Faculty of Sciences at Paris. As such, the contents are well arranged and cover in textbook fashion both theoretical and experimental aspects of the slowing-down of charged particles and the absorption of gamma rays. The topics included appear to encompass rather well the various aspects of a broad and diverse subject. The subject matter includes discussions of binding energies of atoms, cross sections and mean free paths, elastic scattering of charged particles, charge as a function of velocity, the range-energy relationship and stopping power of electrons and nuclei (including fission fragments), ion-pair formation, bremsstrahlung, multiple scattering of electrons, and gamma-ray interactions. The subject of neutron attenuation is not considered. The emphasis in the present book is directed toward giving the reader a panoramic view of the entire subject; in doing so, the author appears to have struck a good balance between discussions of theory and experiment. Theoretical results are liberally illustrated in a large number of figures. This fact contributes significantly to the usefulness of this book as a handy place to look up various functions and constants, e.g., the binding energies of K, L, and M electrons as a function of Z , calculated stopping power of various media to protons from 50 keV to 10 BeV, range-energy curves, gamma-ray interaction cross sections as a function of energy, etc. The information presented here, however, is not encyclopedic and does not go into the detail which is required to obtain the best value of, say, dE/dx of a proton or alpha particle in a given medium. The review of Whaling in the new *Encyclopedia of Physics*, Vol. 34, for example, gives a much more explicit and detailed presentation which one would consult to get numbers. This feature, nevertheless, does not detract from the present book as a comprehensive review of the subject which might profitably be read by advanced students or by those engaged in radiation physics. Numerous references throughout the book provide a guide to more detailed study of the literature.

It is most unfortunate and disappointing that this other-

wise excellent little book has suffered sorely as a result of a loose, inaccurate, and sometimes completely erroneous translation. The distortions are, in many cases, easily deciphered, as when *scattering* appears as *diffusion*, and *selection rules* is translated *laws of forbidden energy levels*. *Momentum* is variously translated as *impetus*, *impulse*, *movement*, *quantity of movement*, *quantity of motion*, and *quantum of movement*. Errors of omission in translation lead to statements which are distinctly misleading, as when *maximum energy loss* is translated *energy loss* or when *back-scattered photons* appears as *diffused photons*. The most serious distortions, however, are those in which the author's original statement is translated with precisely the opposite meaning. As one example, a brief discussion is given of an equation describing the photoelectric cross section for K shell electrons which is applicable under the condition $Z/137 \ll 1$. Berthelot correctly states that this formula is limited in the case of large Z , whereas the translation reads, "The Sauter formula is limited to high Z values." In other instances, *below* is translated *above* and *lightest* occurs as *highest*. Finally, a number of misprints were observed in equations in which, for example, m appears as M , v as V , or $\lambda = v/C$. Some of these misprints occur in the original text, whereas others have been generated during the printing of the translated version. The net result is that the present translation is notably inaccurate and unreliable; the interested reader would do well to have a copy of the French text at hand to check suspicious or incomprehensible statements.

In summary, the original text appears to be a well-done survey of the general subject. The value of the present edition is very much in question as a result of a frequently distorted translation and apparent lack of proofreading.

R. B. MURRAY
Oak Ridge National Laboratory
Oak Ridge, Tennessee

(Editor's Note: Our reviewer, Dr. Marshall Bruce, has been chairman of the Medical Division of Oak Institute of Nuclear Studies since its inception in 1949. This division of the Institute engages in medical research on diseases which can be studied, diagnosed, or treated by the use of radioisotopes. Dr. Bruce is well known in this field not only in the United States but throughout Europe and the friendly countries of the Far East.)

The Isotope Index, The Complete Guide to the Isotopes. Published by Scientific Equipment Company, P.O. Box 19086, Indianapolis 19, Indiana. J. L. Sommerville, publisher. 119 pp. plus advertising, \$5.00. Illustrations only in the advertising. This index does not appear to be for sale in ordinary bookstores but is readily available from the publisher. July, 1959; revised every year.

International Directory of Radioisotopes. Two volumes published by the International Atomic Energy Agency, Kärntner Ring, Vienna I, Austria, July, 1959. Volume I, 264 pp. Volume II, 213 pp., \$3.50 per volume. No illustrations. It is said that this is to be revised every two years. Distributed by National Agency for International Publications, Inc., 801 Third Avenue, New York 22, New York.

These are two catalogues of isotopes and isotope-labeled compounds. One of them, *The Isotope Index*, states in its

table of contents that it "was not supported in whole or in part by any federal, state, or international agency. . . ." The more expensive two-volume document is published by the International Atomic Energy Agency. The cheaper volume is $6 \times 9 \times \frac{1}{4}$ in. and will fit inconspicuously on any bookshelf. The international compilation is $8\frac{1}{4} \times 11\frac{3}{4} \times 1$ in. It will not fit a standard bookshelf.

The Isotope Index crams a tremendous amount of information on each page, but the editor states that the index is a source and purchasing guide and not a technical or engineering book. The isotopes are arranged in alphabetical order by the name of their element. Then they are listed in order of their atomic weight. For ease of reference, half life and the principal radiation from each isotope are listed. The specific activity is given, the cost, some of the delivery and manufacturing details, and the supplier with his catalogue number. The editor makes a strong suggestion that the isotope supplier be contacted for current quotations and details of production before any isotope is purchased. Because of the special legal controls on the purchase of isotopes, the AEC radioisotope licensing procedures are abstracted. Directions are given for purchase.

The *International Directory of Radioisotopes* states in its introduction that it contains information on all radioisotopes for sale or distribution by the major suppliers in the world. The *International Directory* is easier to read, but at the expense of wasted space. Volume I contains a table of radioisotopes including unprocessed and processed preparations and solid sources. Volume II lists compounds of carbon-14, hydrogen-3, iodine-131, phosphorus-32, and sulphur-35. Volume I contains a statement on the safe handling of radioactive materials, which is incomplete and has no value to a person who would be responsible for safe handling. It contains a very short statement on some of the suppliers of radioisotopes. These statements concerning suppliers are probably not those that would be desired by some of the suppliers themselves. The first volume contains some additional information on radioisotope production. These are tidbits that are neither complete nor are they of any value to a purchaser. A page of definitions of terms is given that is not complete; any person who does not know these definitions should not be using a purchasing guide. Before each isotope is listed the half life, many but not all of the radiations produced with the isotope, the production process, the activation cross section, and a hint at "other activities" that might be present in some of the preparations. These technical data are unnecessary in a purchasing guide and incomplete for a technical description. The section on "other activities" is an excellent hint that is not present in some of the standard tables of isotopes, but is certainly present in most of the suppliers' catalogues.

A catalogue of isotopes is a valuable thing to have. Isotopes and labeled compounds have become so ubiquitous that no scientist can keep track of even the suppliers without help. A catalogue is necessary. However, in using a catalogue a number of things are important to the user. (1) The catalogue must be complete. (2) The catalogue must list all possible manufacturers. (3) The catalogue must tell where to get information sufficient to make a knowledgeable purchase. (4) The catalogue must be immediately available.

In checking the *International Directory of Radioisotopes* with one manufacturer I found seven omissions. These were all included in *The Isotope Index*. The situation on isotope-labeled compounds and even on production is changing rapidly and this is likely to continue. Therefore, a one-year revision of the commercial *Isotope Index* will undoubtedly be handier and more accurate than the projected two-year revision of the *International Directory*.

Both purchasing guides list all the manufacturers that I know; however, *The Isotope Index* includes a number of advertising pages that give more information than just an address. I have found the advertising in *The Isotope Index* an asset.

It is too much to expect any purchasing guide to contain all the technical information necessary to the use of an isotope. This is the kind of data that is listed in various handbooks and charts of nuclides. It would seem that *The Isotopes Index* recognizes this and includes only a bare minimum of technical information. The attempt to add additional technical information in the *International Directory of Radioisotopes* is wasteful of library space.

I seldom use a purchasing guide for isotopes; however, when I do want it I want it "right now" and it must be within arm's length. The commercial isotopes index is always handy on my bookshelf. The *International Directory* is so voluminous and such an unusual shape that it could not fit on my bookshelf even if I wanted it to. I have sent my copy to the library where it will never be used. In any case, before I purchase an isotope I contact a number of suppliers. Their catalogues are far more complete, as they should be. The many documents put out by the suppliers in this country and abroad are the final authority on availability (not purity). A purchasing guide can be useful only to direct the purchaser to one of the suppliers. One wonders at the expenditure of public funds to duplicate an already available commercial book that is both more complete and more informative.

MARSHALL BRUCER, M.D.
 Chairman, The Medical Division
 Oak Ridge Institute of Nuclear Studies
 Oak Ridge, Tennessee