beryllium), welds by this process under certain conditions can be made with beryllium. In fact, beryllium welds were made under J. A. Stohr's supervision in the French Atomic Energie Laboratory at Saclay with their original equipment.

Precision tooling is essential to electron-beam welding due to 1) a highly focused beam, 2) the autogenous nature of such work, and 3) inaccessibility of the vacuum atmosphere chamber. Under these conditions, jigging, fixturing and control, and manipulating the gun become significant factors in electron-beam welding and a chapter in the book gives some basic information on these subjects. Since precision tooling may cost more than the basic electron-beam welding equipment, which is itself quite costly compared to other welding equipment, the authors' ideas on requirements for profitable utilization of electron-beam welding units, despite their considerable initial cost, is valuable. The chapter on electron-beam welding standards should act as an incentive and possibly a reference for establishing specifications for electron-beam welding. For practical purposes, such specifications are nonexistent in the industry.

Handbook of Electron Beam Welding should serve a necessary function as a source for basic electron-beam welding technology and its history.

B. M. MacPherson joined the Goodyear Aerospace Corporation as Welding Engineer in 1953. A year later and until 1956, he was with the Jet Division of Thompson Aircraft Products, Inc. (now Thompson-Ramo-Wooldridge) as a Metallurgist, engaged in joining and forging development of high-temperature alloys. Since March 1956, he has been employed at The Brush Beryllium Company in the Metallurgy Division developing brazing, fusion welding, and other joining methods. He received his degree of Bachelor of Metallurgical Engineering from Fenn College in 1953.

REFRESHING, DIRECT, AND ENTHUSIASTIC

Title Industrial Isotope Techniques

Authors Lars G. Erwall, Hans G. Forsberg, and Knut Ljunggren

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Reviewer John F. Cameron

This book describes the applications of radioisotopes in industry and is written by authors who have spent almost their entire careers working on the subject. Therefore, as would be expected, it is an excellent account of the very wide range of applications.

The original material was prepared as a training course for industrial personnel and consequently includes introductory sections dealing with nuclear theory, interactions of radiation with matter, with radiation detectors, and auxiliary electronics. These sections are brief, but contain all the essential information necessary to understand the subsequent chapters. Of the chapters dealing with the industrial uses of radioisotopes, those on tracer techniques and analysis are the best. Very few textbooks deal with these subjects and, therefore, a description of the salient points, by authors who have developed many of the techniques and explained them to all types of audiences, is extremely valuable. Examples of the calculations involved in tracer techniques enable the book to be used as a unique practical guide to those who wish to conduct such experiments themselves. The chapters on radioisotope gauges, radiography, and on applications based on the effects of radiation are good summaries of what can be done with these techniques. They are not as detailed as the chapter on tracers but the techniques and applications are described precisely and in sufficient detail to satisfy everyone except a specialist.

Contained in the Appendixes are data on the radioisotopes most used in industry and other diagrams and nomographs useful for planning industrial experiments. The index is divided into two parts: one contains nuclear terms and titles of radioisotope techniques; the other lists the applications in different industries. This should be useful to the industrialist who wishes to see quickly what has been done in his particular industry, but should not mislead him into thinking that techniques used in other industries cannot also be used with advantage.

The occasional unusual phrase used reveals that the writers do not use English as their mother tongue but, generally, the grammar is correct and the style is refreshing, direct, and enthusiastic.

This is a book that should be read by everyone interested in the subject. The isotope specialist or research scientist who is too specialized can find out what is happening in related fields, and industrialists, ranging from managers to service personnel and those connected with radiation protection, will all find useful information.

From 1951 to 1962, John F. Cameron was with the Isotope Research Division of the United Kingdom Atomic Energy Authority at Harwell and Wantage, working on the development of industrial radioisotope techniques. Later, he specialized on instrumental techniques such as radioisotope x-ray fluorescence, accelerator-type neutron sources, and low-background counting. He joined the International Atomic Energy Agency in Vienna in 1962, where he was initially engaged in hydrological uses of isotopes and in setting up a laboratory to concentrate and count water samples containing low-activity tritium. He is now responsible for promoting industrial application of radioisotopes. Cameron graduated from Glasgow University in 1950 with an honors BSc in mathematics and physics.