this section, if the original volume were published later than 1959 (the book may have been written in 1958), the use of neutron activation and downstream analysis with a gamma-ray spectrometer would probably have been more adequately treated.

Finally, the authors present in Chapter IX, the concluding section, a short, but well written article on "Choice of the Minimum Source Activity for the Particular Dynamic Properties of the Instruments Where the Measured Material Varies Significantly with Time." It is in the constant increase in speed of technological processes that such considerations grow in significance.

The book is hard back, has excellent 11-point typography, and contains many clear and concise drawings. This presentation has the great advantage in that unlike volumes with photographs, the book will not readily become dated. The translation by R. F. Kelleher, formerly of Trinity College, Cambridge, is very readable with only an occasional 'hardly used at all nowadays' redundancy.

In cited literature, the author has 76 references of which ten are to references originally written in English. Again, a later work would have had references from France and Germany, as well as a number of other countries. While the introduction could have been lengthened (the book is written for the engineer who requires only calculus for understanding the subject), a cultural enrichment would have been achieved if the names of discoverers of nuclear particles and radiation, or of a principle, were named, with the date of the discovery. This humanizing addition would have indicated to the non-physicist the true internationality of physics. More references to standard works on ion chambers, gas discharge counters, and scintillation counters would have been valuable to the beginning engineer.

While the subject covered by the authors is valuable to anyone who contemplates the industrial control by radioisotopes, the volume would have been more catholic if references to products other than those available in the U.S.S.R. had been made.

The user and manufacturer of instruments in a capitalistic country, when reading this book, will undoubtedly wonder what force in the U.S.S.R. assumes the function of the market place. What feature in a country, where the state produces and consumes all instruments, encourages the development of new features and new instruments, which competitive forces bring forth in an acquisitive society. Further, what forces in a socialistic society determine the range in the price and complexity of an instrument? What method takes the place of advertising for an instrument, which, by broadening the usage of an instrument, reduces its price?

In conclusion the volume on *Radioactive Isotopes in Instrumentation and Control* belongs on the bookshelves of the serious student in this endeavor.

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*About the Reviewer: Ernest H. Wakefield joined the Metallurgical Project at the University of Chicago in 1943. In the Instrument Group of the Physics Division he edited the* Nuclear Instrument Handbook, *later founded and operated a national company. In 1952 he received his Ph.D. in Electrical Engineering from the University of Michigan, and in 1954 edited* Nuclear Reactors for Universities and Industry. *Elected a Director of the Atomic Industrial Forum in 1959, Dr. Wakefield has travelled and lectured in nuclear centers in many parts of the world. Today he is president of Linear, Inc., of Evanston, Illinois, and Cleveland, Ohio.*

**Desalination of Water Using Conventional and Nuclear Energy.** International Atomic Energy Agency, 1964; (Technical Reports Series No. 24); 53 pages, $1.00.

In 1963 the International Atomic Energy Agency began preliminary surveys of the application of nuclear energy to water desalting. Interest in this field has developed so rapidly that the Agency has organized a major program and has held three conferences on the subject. The booklet reviewed here was published in February 1964 to give member nations who are not active in the field a brief survey of present technical status, potential trends and improvements, and some guidance on assessing whether nuclear desalination is worth their interest.

If one looks sufficiently far ahead, there is no doubt that immense desalting plants driven by integral nuclear reactors will play a major, or even dominant, role in man's increasing demands on the earth's resources. Only 9% of the earth's land surface is arable and sufficiently rain-fed for food production, and it is all in use; 36% is fertile, accessible and warm, but too dry. Increase in output can certainly be achieved, but we shall approach before long the day when it will be cheaper to bring arid land into use with desalted sea water than to force more yield from present cropland.

However, it would be a serious mistake to look upon nuclear desalting as a panacea, especially in the near future. The large plants which can offer the lowest cost water will take time to develop, as will the urgency of our water needs. Smaller plants, producing more expensive water, can serve at first only a few unique areas where special conditions exist. Some countries, therefore, must realize that because their water needs occur in small scattered locations, nuclear desalination makes no sense for them. The program of the IAEA seeks to assist some such areas through the promotion of joint projects which serve two or more countries, and hence could be large enough to justify a nuclear station.

The book fulfills the intended purpose remarkably well for its size. Within the space of 53 pages it provides (1) a review of world demands for water, (2) some examples of areas that might utilize nuclear desalination soon, (3) a brief description and simplified flowsheet of 12 desalting processes, (4) a list of existing (non-nuclear) desalination plants, and (5) a comparative discussion of the technical and economic status of the five most important processes. Referring to nuclear stations, the report gives (6) an excellent discussion of dual-purpose plant arrangements and their advantages and disadvantages, (7) summaries of the factual content of the more important studies of nuclear desalination plants, (8) a summary of economic factors affecting the usefulness and cost of such plants, and (9) a bibliography of the pertinent literature.

The book's value lies in its perspective view. It contains no new technical information, but it presents clearly the major economic and technical issues affecting the short-range potential of nuclear desalination. Thus, it serves its purpose of assisting member countries in deciding what steps, if any, to take into this new field.

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*About the Reviewer: Horace Greeley's "Go West, young man, go west," was apt enough a century ago, but in the nuclear age it's changed to "Think big," and perhaps more precisely, "Think big like Phil Hammond," for he is the originator and principal protagonist of the majestic reactor route to fresher water. His observations here are authoritative, for the IAEA has launched this sally into his desalted sea; and President Johnson has announced a major U. S. program to develop Hammond's big stations.*

**High Sensitivity Counting Techniques.** By D. E. Watt and D. Ramsden. The Pergamon Press, MacMillan Company, New York, (1964). 348 plus XV pages, $12.00.

This book is evidently intended to be a review and compendium of the subject. The authors go into the various phases of the subject quite thoroughly. They start out as one should, defining terms, and then discuss such problems as the attainment of low backgrounds by the elimination of cosmic-ray and natural contamination backgrounds. In doing this they show a good understanding of the nature of the problem, as well as a realization of the large fluctuations in the local background radiation. They discuss the electronic circuits as well. They point out how spurious counts can originate, and describe preventive measures.

The authors next discuss in much detail the various techniques for measuring weak alpha and beta activities. Radiocarbon techniques come in for a special chapter. Tritium problems are treated, solid angle considerations are detailed, procedures and instruments are described in detail. The last two chapters deal with gamma ray problems and technologies. Scintillators, gas-counters and ionization chambers are all described in detail, together with discussions of methods and precautions.

The book seems to this reviewer to be excellent. It discusses the various problems and techniques thoroughly and competently. It gives examples and numbers. It explains the reasons for various instrument designs and operational procedures. There is an extensive bibliography for those who wish to learn more or to trace a statement or development backward. Further, the authors have shown they have a good understanding of the actual problems which are encountered in practice. Thus for example it has always interested this reviewer that many workers in the field of low activity detection today are either unwilling to accept or are greatly astonished by the great variability in the radon content of that part of the atmosphere which surrounds their instruments. This disbelief is the more surprising in view of the considerable body of data which the persons studying atmospheric electricity gathered four or five decades ago. Doubtless this is a result of a tendency to read only the most recent papers and to regard all information gathered more than thirty years ago as obsolete. The present book acknowledges the large background fluctuations.

As in any book, there are some points on which the authors leave a reviewer puzzled. For example, on page 115 there is a remark about the