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

effect of a partial eclipse of the sun causing a big change in a counter background. Although the authors do not specifically come out and say so, they imply that radiation of solar origin was cut off by the interposition of the moon. While photons are indeed so cut off, charged particles from the sun do not move in straight lines and the effect which is reported must have some quite different explanation. Further, charged particle radiation of solar origin has reached sealevel a half-dozen times, at the most, in the last decade. This effect is rare and shows large latitude dependence.

On the whole, the book is excellent. It will form a useful addition to the library of anyone interested even in low activity detection. It should certainly be read carefully by anyone about to start on such work. It is a welcome addition to the literature of the subject.

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About the Reviewer: Serge A. Korff is a Professor of Physics at the New York University. Since receiving his Ph.D. degree from Princeton in 1931, Professor Korff has taught at the University of Chile and the University of San Andres, Bolivia; he was a Senior Consultant with the UNAEC in 1951 and was a member of several cosmic-ray expeditions during the past 20 years. Professor Korff is a Fellow of the Physical Society and of the American Geographical Society, and is an Honorary Member of the Lima Geographical Society.

The Analytical Chemistry of Thorium. By D. I. Ryabchikov and E. K. Gol'braikh. Pergamon Press, The Macmillan Company, New York, (January 27, 1964). 316 pages. $14.00.

The Academy of Sciences of the U.S.S.R. is sponsoring the publication of some 50 volumes on the analytical chemistry of the elements. Approximately five years will be required to complete the project. This inaugural volume is devoted to thorium. Subsequent volumes nearing publication are those on the analytical chemistry of plutonium, lithium and gallium. The general approach in writing these monographs is to include 1) general information on the properties of the element and its compounds, 2) a description of the important chemical reactions, 3) a review of the physical and chemical methods of analysis and 4) methods of analysis of the ores, the element, its alloys and compounds. Some effort is to be made to be as critical as possible of the methods listed. A comprehensive list of references is to be included.

In general, one must conclude that the authors of the volume on thorium have set a rather high standard of completeness for succeeding authors. There is only a modest amount of duplication of procedures. The methods are presented in a concise, yet sufficiently complete, manner so that practicing analysts can make direct use of this book. Thus the authors have successfully combined a portion of the procedural manual with the reference book. In brief, this volume presents nearly all the information that one desires on the analytical chemistry of thorium.

There are several areas where the authors have chosen to be extremely brief when, in the reveiwer's opinion, more detail would be welcomed by analytical chemists. The discussion of spectrophotometric methods is not as well done as that on gravimetric and volumetric methods. The authors have failed to be critical and do not give comparative data on the sensitivity of the reagents cited. This is a shortcoming that hopefully will be corrected in future volumes. The section on separations by solvent extraction is rather weak. Little space is given to thenoyltrifluoroacetone (TTA), certainly one of the more widely used reagents for this purpose. More emphasis should have been given to X-ray fluorescence measurement of thorium concentration, an extremely useful means of analysis. Activation analysis is only briefly mentioned. A few grammatical and typographical errors were observed, perhaps more than usually associated with texts of this kind.

This series and this book will have a special appeal to analytical chemists and others, too, in that it provides an insight into Russian work and attitudes toward analytical chemistry. Certainly these volumes will be carefully scrutinized and reviewed. Since a similar series with similar objectives is being published in the United States (edited by Kolthoff and Elving), comparisons of their relative merit are inevitable. The volumes on thorium which were published essentially at the same time are nearly identical in organization, content and scope. Both provide the reader with a complete history of the analytical chemistry of the element. It is unlikely that many individuals will purchase the entire set of either or both series; technical libraries will, however, be incomplete without such works.

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About the Reviewer: J. C. White is the Assistant Director in charge of research and development of the Analytical Chemistry Division of the Oak Ridge National Laboratory. He has been a member of the staff of ORNL since receiving his Ph.D. degree from Ohio State University in 1950. His research interests have been in separations by solvent extraction and the analysis of molten salts