lished recently. Instead, this book should serve as a splendid reference volume. The usefulness of the present version is severely impaired by the lack of an index. Otherwise, the rendition into English is quite readable, although the typography must be characterized as only fair. It is to be hoped that a fully indexed translation of the complete 1959 edition will be published shortly.

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A Review for Specialists

The Theory and Practice of Scintillation Counting. J. B. Birks. Pergamon, London; Macmillan, New York, 1964. xx + 662 pp. Illus. $17.50.

The use of scintillation counters has come to be of enormous importance in many fields, including nuclear physics, medicine, space physics, chemistry, biology, geophysics, and geology. Therefore, a comprehensive treatise like this one will find many potential readers. The present volume, which is separated by an 11-year interval from Birk's first book, *Scintillation Counters*, consists of a documentation and discussion of the very large literature from papers, conference proceedings, review articles, and similar sources. The author's field of specialty is organic scintillators, and much of the text deals with research results on the fundamental process of scintillation in organic materials, both liquid and solid. The book is organized in 16 chapters, each of which includes a reference bibliography aimed at being extremely comprehensive. The introductory chapter includes a general bibliography, as well.

Various types of nuclear detectors and the early history and principles of scintillation counting are covered in the introduction. This is followed by a useful chapter on the interaction of radiation with matter, including range-energy curves for various particles and a discussion of the photoelectric and Compton processes with applications to scintillation materials. Chapters 3 and 4 outline the theory of the scintillation process in organic and inorganic crystals. In the chapter on the detection of scintillations (chapter 5), phototubes, light pipes, and the reflectivity of surfaces used for light gathering are treated, and there is an interesting discussion of the meaning of line width as seen in the usual way on the output of a photomultiplier, a discussion of the pulse shape and time resolution of photomultipliers, and a lengthy table (14 pp.) on the characteristics of commercial photomultipliers, including some of Soviet manufacture. In chapters 6 through 10 additional details of organic scintillators, both crystalline and plastic, and their applications are considered. This section of the book comprises 246 pages. Birks then devotes further discussion to the scintillation process in inorganic crystals, and this is followed by chapters on alkali halides and other inorganic solids, such as zinc sulfide and cadmium sulfide. Scintillations in gases and the applications of gas scintillators are discussed in chapter 14. The book has a short concluding chapter, and an extensive postscript which describes important work that came to the author's attention after the completion of the original manuscript. This postscript with its reference list of 103 papers, almost all of which were published in 1962 and 1963, testifies to the enormous current activity in the field of scintillation counting.

Because the book is in the nature of a greatly enlarged review article, it will be of most use to specialists in the field of scintillation counting. It will be of particular use to research workers who are encountering new problems in the development of scintillation materials and for them will be an important sourcebook.

However, the book is not organized for use as a reference handbook by those who are interested in the quick solution of a practical problem in scintillation counting. This is because the author covers such a large amount of material but has not digested and presented the material so that it is easy to find specific information on a particular topic. For example, while I was examining the book, a current application problem arose in the laboratory —we needed to find the relative merits of sodium iodide and anthracene for detecting charged particles. The many curves showing the efficiency of anthracene and the separate curves for the inorganic materials were not presented on the same basis, and we could not find a single figure or table in the book which compared the relative efficiencies of these scintillation materials for different kinds of radiation. The answer was finally obtained from curves given in a manufacturer's brochure. The book lacks a subject index, and despite the author's statement that he could not compile one, a subject index, even an incomplete one, would add greatly to the book's usefulness. The working physicist might wish for a chapter which would serve as a "handbook of scintillation counting" and which would represent the author's digestion and condensation of the vast amount of research material documented in *The Theory and Practice of Scintillation Counting.*

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Analytical Chemistry

The Geochemistry of Oil and Oil Deposits. L. A. Gulyaeva, Ed. Translated from the Russian edition (Moscow, 1962) by S. Caspari. Israel Program for Scientific Translations, Jerusalem; Davey, New York, 1964. iv + 220 pp. Illus. $7.50.

Works translated into the English from the Russian language are frequently difficult to read and comprehend, and whether reading *The Geochemistry of Oil and Oil Deposits* is worth the effort depends on the validity of the conclusions reached by the investigators. The book is divided into two sections: (i) discussion of the compositions of the organic materials in petroleum and sedimentary rocks and the behavior of petroleum-like components in rocks under the action of compressed gases; and (ii) presentation and interpretation of analyses of rocks and waters from oil fields.

Although the investigators purportedly used modern methods of investigation, they did not fully exploit the capabilities of modern instruments and techniques, and their analyses of organic materials are usually reported in percentages of poorly defined substances such as bitumens, benzene-alcohol extracts, oily components, asphaltenes, or humic acids. Many of the conclusions that are presented by the various authors appear to be more strongly supported by presumptions than by analytical data. Nevertheless, some of these conclusions deserve further attention. The analyses of halogen compounds in bitumens and crude oils and of organic solutes in formation waters, which are described in the book, are novel and are potentially of theoret-