1964, and the thoroughness of coverage is demonstrated by the approximately 950 references cited. The two major subjects treated in this book are trigonal boron compounds containing at least one boron-nitrogen bond, and borazines. Compounds with boron-boron bonds have been excluded from the series. Other classes of compounds covered are heterocyclic boron-nitrogen compounds other than the borazines, tetrahedral boron-nitrogen compounds, boron-nitrogen polymers, and boron-phosphorus compounds. Though ignored in the title, boron-arsenic and boron-antimony compounds are also included. Nomenclature is discussed in each of the chapters, whereas in volume 1 this was done in a separate chapter near the beginning of the book.

Since boron-nitrogen compounds do not occur in nature, a book on these compounds must necessarily be an account of their preparation and reactions. The authors have provided excellent coverage of both. In addition, they have included an impressive quantity of data on physical constants. In the literature there are a number of reviews that deal with some classes of compounds, such as borazines, covered in this book, and there are also general reviews with a less restricted coverage of boron-nitrogen chemistry. But this book is nevertheless highly recommended as an excellent detailed reference work for those interested in this fascinating and rapidly growing field of synthetic chemistry.

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Letters of Priestley

A Scientific Autobiography of Joseph Priestley (1733–1804). Selected scientific correspondence, edited, with a commentary, by ROBERT E. SCHOFIELD. M.I.T. Press, Cambridge, Mass., 1967. 431 pp., illus. $13.50.

Joseph Priestley was one of the most prolific writers in an age noted for its prolific writers. One thinks immediately of the massive volumes of Edward Gibbon's *Decline and Fall* and of Dr. Samuel Johnson's dictionary, but these pale into insignificance (quantitatively) beside the theological, polemical, political, historical, and scientific writings of Priestley. It was Priestley's proud boast that he never revised but published everything at the white heat with which it left his pen. The result is a forbidding pile of material upon which the historian of science must look with some degree of apprehension, for the scientific nuggets are often buried in a veritable mountain of other matters. From this mountain, Robert E. Schofield has extracted the essence (he feels) of Priestley's scientific thought. His edition is a model for future editors of scientific correspondence. From it there emerges what the title describes as a scientific autobiography, for Priestley was a frank man and his ideas and his opinions are clearly expressed in his letters.

Here are to be found many of the more important controversies of the 18th century. There is Priestley's caustic letter to Father R. J. Boscovich on the application of Boscovich's theory of point atoms to what Boscovich thought to be the cause of materialism. One can also read Priestley's reaction to the new chemistry which dispensed with phlogiston in favor of the new French essence of combustion, oxygen. And there is much more. Interspersed throughout are commentaries by Schofield which add materially to the value of the letters.

I have only two criticisms to direct at this work. The first is the failure of the editor to identify people mentioned in the body of the letters. There is an excellent biographical appendix which gives short sketches of the recipients of Priestley's pen, but the reader is left to fend for himself with those people mentioned by Priestley. Thus, on pages 205, 208, 215, and 261, for example, a Mr. William Russell is mentioned but, in spite of the terms of familiarity with which Priestley speaks of him, we are given no clue as to his identity. The second criticism is one the justice of which only Schofield can decide, for only he knows the Priestley material thoroughly. He has restricted this volume to the "scientific" correspondence of Priestley but he has also noted that Priestley's "science" was, in many cases, subordinate to his larger vision of reality. The question is, where has Schofield drawn the line? Do we lack some essential documents here because they were not "scientific" as Schofield understands the term? Fortunately, the answer will soon be forthcoming, for Schofield's biography of Priestley will, undoubtedly, be the definitive life. In the meantime, I can only recommend this volume strongly as a work which sheds great light upon the career of Joseph Priestley in particular and upon the life of science in the 18th century in general.

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Mathematics of Systems

Modern Foundations of Systems Engineering. WILLIAM A. PORTER. Macmillan, New York, 1966. 501 pp., illus. $14.95.

Techniques for the analysis and design of engineering systems are undergoing major revision, largely because of the availability of the digital computer for the simulation and realization of complex systems. Whereas classical approaches are directed toward closed-form analytical descriptions of system behavior and performance, the more recent techniques lead to algorithmic descriptions. The tools and notation for this kind of description have been found in matrix algebra and in the more abstract framework of functional analysis. These techniques have not yet been fully established or refined to the point where intuition and insight are easily conveyed.

Porter's book is another step in the direction of these goals. It is oriented toward providing a mathematical basis of modern system theory rather than a detailed account of the applications. While the book is written in a mathematical style, the author has made an effort to motivate the development. He has been particularly successful in the first two chapters, which deal with the definitions and properties of function spaces and with transformations between spaces. The material in these chapters is presented with enough informality to make the reader comfortable while maintaining the precision and elegance of the ideas. The remaining two chapters investigate the structure of linear systems and the application to a class of problems in optimal control. The nine appendices provide supplementary material both on functional analysis and on the optimal control problem considered in chapter 4.

This book is somewhat of a departure from other recent texts in its use of the more general and abstract function space notation, and it is characterized primarily by the generality of the approach. As the author says: ". . . the basic problem is com-